Cape Peninsula
University of Technology

A FRAMEWORK FOR SUSTAINABLE ADOPTION OF E-HEALTH TOOLS IN DELIVERING DIGITAL MENTAL HEALTH SERVICES AT A SELECTED SOUTH AFRICAN UNIVERSITY

by

RHODRICK NYASHA MUSAKURO

Thesis submitted in fulfilment of the requirements for the degree

Doctor of Human Resource Management

in the Faculty of Business and Management Sciences

at the Cape Peninsula University of Technology

Supervisor: Dr Liiza Gie

District Six, Cape Town

14 October 2024

DECLARATION

I, Rhodrick Nyasha Musakuro, declare that the contents of this thesis represent my own unaided work, and that the thesis/dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

South African higher education institutions (SA HEIs) heavily depend on their staff to achieve their goals. However, the demanding nature of university work responsibilities, combined with the following factors: increased student enrolment; reduced job autonomy; increased pressure to improve national and international research publications; increased demands associated with postgraduate supervision; ineffective leadership and management; and increased administrative responsibilities, have contributed to the increase in mental health concerns among university staff (Kinman & Johnson, 2019:159; Gie, Slabbert & Haydam, 2017:11; Barkhuizen, Rothmann & Van de Vijver, 2014:330; Bezuidenhout & Cilliers, 2010:1). Furthermore, university staff experienced increased mental health issues as a result of the recent COVID-19 pandemic, highlighting the urgent need for support (Allen, Rowan & Singh, 2020:233). In SA HEIs, e-health tools emerged as a potential solution for delivering digital mental health services (DMHS) to university staff during the pandemic. However, research on the sustainable adoption of e-health tools in delivering DMHS within SA HEIs is limited. This study aimed to develop a framework for the sustainable adoption of e-health tools for DMHS at a selected university.

The study adopted a case study, focusing on a single university in Cape Town, South Africa, and included an online survey with quantitative methods within a positivist paradigm. Voluntary response sampling technique was utilised to collect data from 348 participants. Data analysis employed frequency distribution, descriptive statistics, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modelling (SEM).

The study findings provide empirical evidence that factors influencing the sustainable adoption of e-health tools for DMHS directly lead to the development and implementation of effective strategies for their sustainable adoption. While the COVID-19 pandemic was a key driver for their initial adoption in SA HEIs, its impact on sustainability was limited. The findings further indicate that as the factors influencing adoption increased, the current level of adoption decreased, suggesting that initial enthusiasm was countered by implementation challenges during the pandemic. The study also provides empirical evidence that the mere existence of DMHS alone is insufficient for the sustainable adoption of e-health tools; instead, effective strategies are essential to improve and ensure their long-term use in the delivery of DMHS.

The main output of this study is the development of a framework for the sustainable adoption of e-health tools in delivering DMHS at a selected university. Accordingly, this could potentially be applicable to similar university contexts, contributing to the achievement of Sustainable Development Goal 3 of the United Nations of ensuring good health and wellbeing.

ACKNOWLEDGEMENTS

I wish to thank:

- My Lord and Saviour, Jesus Christ, whose grace and divine guidance sustained me throughout this doctoral journey, making the completion of this thesis possible.
- My supervisor, Dr. Liiza Gie, for the invaluable guidance, support, and scholarly insights. Your constructive criticism, positive attitude and trust in my intellectual abilities have been instrumental in shaping the trajectory of my doctoral thesis.
- My beloved Musakuro family, your unwavering love, encouragement, and understanding have been my pillars of strength throughout this doctoral journey. Thank you, Mom and all others, for your prayers, constant support and belief in my abilities.
- My wife, Dr. Prominent Choto, for the moral support.
- My son, Joshua, born during the uncertainties and challenging times of COVID-19. Your arrival brought immense joy, laughter and purpose to my life.
- My daughter, Julia for the joy and inspiration you have brought into my life during this doctoral journey.
- Ms. Carmen Stindt and Dr. Corrie Uys, two exceptional statisticians whose expertise played a key role in the completion of this doctoral thesis. Your professionalism, meticulous analysis and statistical proficiency were helpful in shaping the empirical foundation of this study.
- Ms. Melody Kozah whose careful proofreading and editing greatly contributed to the clarity and coherence of this research study.
- University staff who generously participated in this study. Thank you for your time and commitment to the advancement of knowledge in academia.
- My fellow postgraduate students and friends (Tichaona B. Musikavanhu, Washington Makuzva, Blessing Mhungu, Tendency Beretu, Gift Muresherwa, Melania Makumbe, Leon Gwaka, Charlotte Choga, Samson Asoba and Joy Okoli) for the shared laughter, encouragement and mutual support throughout the doctoral journey. Your presence made this academic endeavour more enriching. I am grateful for the friendships we created during this challenging but rewarding process.
- The financial assistance of Cape Peninsula University of Technology (CPUT) towards this research is acknowledged. Opinions expressed in this thesis and the conclusions arrived at, are those of the author, and are not necessarily to be attributed to the CPUT.

DEDICATION

- In loving memory of my late father, Basil Z. K. Musakuro, and my late sister, Rutendo Musakuro. Their unwavering love, support, and wisdom continue to inspire me, and it is with heartfelt appreciation that I dedicate this doctorate thesis to their treasured memory. Although they are no longer with us, their enduring impact on my life is reflected in every word and achievement of this work.
- I also dedicate this work to my beloved Musakuro family, whose moral support, love, encouragement, and unwavering support have been the pillars of strength throughout my doctoral journey. Your sacrifices and belief in my aspirations have been the driving force behind this achievement. This thesis is a testament to our shared commitment to growth, resilience, and the enduring strength of family bonds.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

4IR	Fourth Industrial Revolution
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
CBT	Cognitive behavioural therapy
CET	Community Education and Training
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CHE	Council for Higher Education
CMIM	Minimum discrepancy
COVID-19	Coronavirus infectious disease 2019
CR	Composite Reliability
DF	Degree of freedom
DHET	Department of Higher Education and Training
DoE	Department of Education
DMHS	Digital mental health services
EAP	Employee Assistance Programmes
EFA	Exploratory factor analysis
E-health	Electronic health
HEIs	Higher education institutions
ICT	Information communication technologies
KMO	Kaiser-Meyer-Olkin
NGOs	Non-governmental organisations
PSET	Post School Education and Training
PTSD	Post-traumatic stress disorder
RMSEA	Root mean square error of approximation
SA	South Africa
SADAG	South Africa Depression and Anxiety Group
SD	Standard Deviation
SARS	Severe acute respiratory syndrome
SEM	Structural equation modelling
SMS	Short messaging service
SPSS	Statistical Software Package for Social Sciences

SRMR	Standardised root mean square residual
TAM	Technology Acceptance Model
TOE	Technology-Organisation-Environment theoretical framework
TVET	Technical and Vocational Education and Training
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTAUT	Unified Theory of Acceptance and Use of Technology
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

The World Health Organisation (WHO) (2001:1) posits that mental health is fundamental to overall health, encompassing a state of wellbeing where individuals can recognise their abilities, manage everyday challenges, work productively and contribute to their community. The comprehensive concept of health integrates physical, mental and social well-being, noting that health is incomplete without mental health (WHO, 2013:1). Sartorius (2006:662) assert that health should be viewed as a condition of positive wellbeing rather than merely the absence of disease. In addition, the United Nations (UN) (2020: 5) emphasises that mental health is essential for individuals' interactions, learning, work, and life experiences. This accentuates the significance of mental health as a vital component of overall health.

Mental health issues are a major public health concern globally, impacting more than 450 million people (Bauman & Rivers, 2015:1). The UN (2020:5) claims that the economic impact is enormous, with mental health issues costing the world economy approximately $1 trillion annually in lost productivity due to psychological distress. Between 2010 and 2030, the cumulative global economic loss due to mental conditions is projected to exceed $16 trillion, severely affecting productivity and the quality of life (Bloom, Cafiero, Jane-Llopis, Abrahams-Gessel, Bloom & Fathima, 2011:5). In South Africa (SA), severe mental disorders account for an annual loss of $3.6 billion in earnings (Lund, Myer, Stein, Williams & Flisher, 2013:845). Mental health problems also significantly contribute to the global disease burden and are linked to premature mortality and socio-economic issues (Vos, Barber, Bell, Bertozzi-Villa, Biryukov, Bolliger, Charlson, Davis, Degenhardt, Dicker & Duan, 2015: 743-800). This highlights the importance of addressing mental health disorders to alleviate the economic burden and improve the quality of life.

Mental health care in workplaces, including in higher education institutions (HEIs), faces several challenges such as stigma, discrimination, poor service facilities, inadequate prioritisation, low resource allocation and often lack sufficient funding (Willie, 2017:2; Lund, Petersen, Kleintjes & Bhana, 2012:404; Saxena & Skeen, 2012:397; Kakuma, Kleintjes, Lund, Drew, Green & Flisher, 2010:122). Research shows that stigma and discrimination towards individuals with mental illness are widespread and are frequently associated with social isolation, shame, secrecy, and can lead to stereotypes (Petersen & Lund, 2011:755; Barkway, 2006:133). Moreover, health care

professionals often struggle to meet the increasing demands for mental health, which complicates access to health care (O'Leary, Bhattacharya, Munson, Wobbrock & Pratt, 2017:1480). It is therefore not surprising that the UN (2020: 6) assert that mental health is one of the neglected areas of health, which presents serious public health concerns, in particular, to SA HEIs.

SA HEIs are vital to the SA economy as they produce graduates and generate new knowledge through research and innovation. To this end, the success of universities heavily relies on their staff, including management, academic and non-academic staff, who work collaboratively to fulfil the institution's mission and vision (Theron, Barkhuizen & Du Plessis, 2014:1). Given the demanding nature of higher education environments, mental health support for university staff is essential to sustain productivity and their wellbeing.

Employees including university staff spend a significant amount of time in the workplace, an environment that can either have a negative or positive effect on employees' mental health (Melzner, Heinze & Fritsch, 2014: 1357; Barkway, 2006:131). According to Graveling, Crawford, Cowie, Amati and Vohra (2008:1), it is normal for employees to experience stress and anxiety within short periods, without it affecting their overall mental health in the workplace. However, exposure to chronic stress and anxiety in the workplace can be harmful to mental health (Marin, Lord, Andrews, Juster, Sindi, Arsenault-Lapierre, Fiocco & Lupien, 2011:584). Research conducted by Aleksynska, Berg, Foden, Johnston, Parent-Thirion and Vanderleyden (2019:1) reported that some employees have faced increased work intensity and emotional demands over the last decade, which have significantly influenced their mental health. Kinman and Johnson (2019:1) further explain that work intensity and widespread changes have been experienced over the last 20 years in universities. In SA, HEIs underwent changes in the post-apartheid era mandated by the government and this was further amplified in the National Development Plan 2030, as part of the transformation agenda (Pienaar & Bester, 2009:376; National Planning Commission, 2013: 295-328). These changes in universities have prompted researchers to investigate some of the issues related to the mental health of university staff, including employee wellness programmes. Previous studies have identified several factors that negatively impact the mental health and wellbeing of university staff. These factors include increased student enrolments, reduced job autonomy, heightened pressure to improve national and international research publications, increased pressure linked to postgraduate supervision, ineffective leadership, and management, increased administrative responsibilities, poor quality working relationships and a lack of engagement in decision-making (Kinman & Johnson, 2019:159; Gie, Slabbert & Haydam, 2017:11; Barkhuizen, Rothmann & Van de Vijver, 2014:330; Bezuidenhout

& Cilliers, 2010:1). This suggests that earlier reforms in universities had an impact on the mental health of university staff. According to Kinman (2014:228), work-related pressure has a substantial impact on academics' well-being. Furthermore, the increasing number of roles and job demands that academic staff have to fulfil without a corresponding increase in job resources are known to be challenging, negatively impacting mental health and job performance (Kinman, 2014:230; Barkhuizen, Rothmann & Van de Vijver, 2014:9; Biron, Brun & Ivers, 2008:519). Specifically, increased job demands compounded by low response mechanisms or strategies often result in mental health problems (Rothmann, Barkhuizen & Tytherleigh, 2008:405). Houston, Meyer and Paweai (2006:11) state that the risk of mental health issues in universities is steadily growing, primarily due to the highly demanding work environment that university staff operate in. Supporting this viewpoint, Kinman (2014: 227) argues that university staff often find it difficult to balance their work-life activities. Empirical evidence indicates that work overload and poor quality of work-life balance leads to health problems including poor mental health (Winefield, Boyd & Winefield, 2014: 683–697; Catano, Francis, Haines, Kirpalani, Shannon, Stringer & Lozanzki, 2010: 257).

Apart from the internal issues in HEIs, it appears that external factors, such as global crises, or disease outbreaks outside academia, which universities cannot control, have the potential to affect the mental health of university staff. Past pandemics such as severe acute respiratory syndrome (SARS) and more recently COVID-19 pandemic have led to significant mental health challenges, including heightened anxiety, stress and post-traumatic stress disorder (PTSD) (Mak, Chu, Pan, Yiu & Chan, 2009: 318-326; Zhang, Wu, Zhao & Zhang, 2020:2). The COVID-19 pandemic posed serious threats to public health worldwide. Consequently, government measures such as lockdowns, quarantines, social distancing, and mandatory face masks have been shown to negatively affect mental health. Sahu (2020:5) explains that during COVID-19, many universities quickly shut down in-person operations, including teaching and learning and transitioned to digital operations thus utilising multimodal teaching and learning methods as a short-term solution in the absence of the COVID-19 vaccine. Digital operations required university staff to work remotely, which eventually led to challenges such as email overload, prolonged online meetings, increased student inquiries, and general work overload due to the heightened demands of online teaching and learning (Allen, Rowan & Singh, 2020:233). The combination of these challenges resulted in a decline in the mental health of university staff. Moreover, the sudden surge in COVID-19 cases, including deaths, created tension, anxiety, and uncertainty among the university fraternity (Sahu, 2020:3). Hall, Hall and Chapman (2008: 446–452) argue

that employees' concerns about contracting the disease or virus, resulting in stress, anxiety, and sadness, is likely to increase during a pandemic. Therefore, the impact of COVID-19 on the mental health of university staff includes exposure to traumatic events such as the loss of a loved one, threats to personal wellbeing, concerns about one's work performance, and PTSD. These factors can lead to the development of acute stress disorder if symptoms persist (Restauri & Sheridan, 2020:925; Inchausti, MacBeth, Hasson-Ohayon & Dimaggio, 2020:2). Additionally, studies indicate it was uncertain whether the work environment would significantly improve after COVID-19, and adapting to these changes could potentially lead to additional stress and anxiety for many employees (Inchausti et al. 2020:6).

The UN (2020:2) reported that "although the COVID-19 crisis is, in the first instance, a physical health crisis, it has the seeds of a major mental health crisis as well if action is not taken". They further advised different stakeholders, notably HEIs, to encourage, safeguard, and care for staff mental health to reduce the implications of the pandemic (UN, 2020:14). Xiang, Yang, Li, Zhang, Zhang, Cheung and Ng (2020:2) endorsed this viewpoint and further recommended measures to support and protect the mental health of employees. In the realm of health care, there has been growing advocacy for the use of information communication technologies (ICTs), commonly referred to as electronic health tools (e-health tools), to address public health challenges. These tools are increasingly recognised for their potential to help alleviate mental health issues within SA HEIs (Sharma, Harrington, McClellan, Turakhia, Eapen, Steinhubl, Mault, Majmudar, Roessig, Chandross & Green, 2018: 2680; Safi, Thiessen & Schmailzl, 2018:1-8). Studies show that the recent COVID-19 pandemic hastened the adoption of e-health tools, demonstrating their ability to support mental health in workplaces, including HEIs (Fagherazzi, Goetzinger, Rashid, Aguayo & Huiart, 2020:1; Kawadler, Hemmings, Ponzo, Morelli, Bird & Plans, 2020:8; Beiwinkel, Eibing, Telle, Siegmund-Schultze & Roessler, 2017:10).

In 2020, which saw a surge in digital service transfers, mental health care in SA also underwent a digital transformation. On 28 July 2020, Higher Health, a national agency under the Department of Higher Education and Training (DHET), in collaboration with the South African Depression and Anxiety Group (SADAG) and various HEIs, established the digitalisation of mental health services as an intervention to the COVID-19 pandemic. The programme included webinars, online workshops, support groups, and online resources to provide mental health support (Mwangama, Malila, Douglas & Rangaka, 2020:7; Fairburn & Patel, 2017:19). Thus, the reaction to the pandemic presented an opportunity to support university staff with feasible and cost-effective tools for digital mental health services (DMHS).

It is evident from the above that sustainable adoption of e-health tools in delivering mental health services is vital and needs to be investigated as it ensures the continual provision of DMHS in SA HEIs. The sustainable adoption of e-health tools has become a significant concern for the future of DMHS worldwide (Van Velthoven & Cordon, 2019:6; Fanta & Pretorius, 2018:132–147). Recent studies concur and further predict that the future of public health care will be digital thus, acknowledging the value of e-health tools is crucial, particularly for delivery of DMHS and for planning future pandemic response (Fagherazzi et al. 2020:6; Rudd & Beidas, 2020:2). However, despite digital interventions for mental health in SA HEIs, there is limited scientific evidence regarding the sustainable adoption of e-health tools in delivering DMHS to university staff.

Considering that SA HEIs are increasingly focusing on e-health tools for DMHS, it is important to investigate the impact of factors influencing the sustainable adoption of these tools on strategies for the sustainable adoption of e-health tools to deliver DMHS in SA HEIs. A previous study conducted by Fanta and Pretorius (2018:144) utilised a literature review and systems approach to investigate the interactions between these elements but it could not empirically test the relationships. Currently, no studies provide empirical evidence on the relationship between factors that influence the sustainable adoption of e-health tools and strategies for their sustainable adoption, to deliver DMHS in SA HEIs. The absence of empirical evidence leaves it uncertain and unclear which factors influence the sustainable adoption of e-health tools in SA HEIs, which may potentially impact the development and implementation of effective strategies for their long-term use in delivering DMHS. Therefore, more research is needed to understand these factors and better inform the development of strategies to sustainably adopt e-health tools.

The COVID-19 pandemic has been linked with increased psychological distress, highlighting the need for SA HEIs to embrace e-health tools for DMHS following remote and multimodal teaching and learning policies. However, considering that the future of public health is anticipated to be digital, there is a growing concern about the future direction of DMHS in the post-COVID-19 work environment (Fagherazzi et al. 2020:6; Rudd & Beidas, 2020:2; Bierbooms, van Haaren, IJsselsteijn, de Kort, Feijt & Bongers, 2020:2). This necessitates a comprehensive understanding of how the experiences learned during the COVID-19 pandemic could impact the sustainable adoption of e-health tools in the delivery of DMHS. Accordingly, this elevated the need to investigate whether a positive relationship exists between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA HEIs.

Complex challenges are known to impede the sustainable adoption of e-health tools in the delivery of DMHS. Some of the challenges include inadequate funding and ICT infrastructure, a total lack of patient adherence to technology, increasing concerns over data privacy and security and the absence of lack of patient involvement in the development of digital health initiatives (Van Velthoven & Cordon, 2019:5; Sharma et al. 2018: 2687). Accordingly, this study argues that SA HEIs will not fully grasp the current level of e-health tools without first understanding the unique challenges experienced by university staff in adopting e-health tools for delivering DMHS. As supported by Tornatzky, Fleischer and Chakrabarti (1990) and Davis (1989:320), the sustainable adoption of e-health tools requires a combination of technological, organisational, social (user-related), and environmental factors. A combination of these factors should thus provide an in-depth insight into factors contributing to the future use of e-health tools for DMHS. This in turn should help not only in the development of strategies for the successful implementation of e-health tools in the delivery of DMHS but also in the improvement of the current state of e-health tools' adoption. In this regard, it is imperative to examine the relationship between the factors that influence the sustainable adoption of e-health tools for DMHS and their current state of adoption.

The study contends that the use of these tools requires effective and efficient strategies to deliver sustainable DMHS given the increasing availability of various e-health tools worldwide. According to Graham, Lattie, Powell, Lyon, Smith, Schueller, Stadnick, Brown and Mohr (2020:1080), the shift from traditional (face-to-face) mental health services to digital platforms make alignment and integration challenging given the differences between the two approaches. This means that organisations must establish strategies that promote the effective use of e-health tools, ensuring high levels of user adoption, engagement and long-term sustainability (Graham et al. 2020:1080). Moreover, a recent guide on digital implementation by WHO (2020:7) recommended that the adoption of digital health technologies should be guided by digital health strategies that outline the implementation processes for new digital health mechanisms. Therefore, SA HEIs must develop strategies that should guide and sustain the use of e-health tools to deliver DMHS. However, while some SA HEIs have adopted e-health tools to deliver DMHS, it appears that sustainability has remained a challenge. The reason for this could be that SA HEIs are not developing and implementing effective strategies for the utilisation of e-health tools which would improve their current state of adoption as widely as it should be. Accordingly, this incited the need to examine whether a positive relationship exists between the current state of adoption of e-health tools in delivering DMHS in SA HEIs and strategies for their sustainable adoption in delivering DMHS.

Investigating the sustainability of the e-health tools has raised concerns due to the lack of clarity on how organisations should proceed with delivering DMHS (Van Velthoven & Cordon, 2019: 1 – 6; Fagherazzi et al. 2020: 1 – 6). Although previous studies address some of these issues, they have overlooked emerging economies like SA, which has significant HEIs and a potential for widespread sustainable adoption. An analysis of a recent study concerning the sustainable adoption of e-health for mental health service delivery showed that the study has a European-centric view (Van Velthoven & Cordon, 2019: 1-8). The lack of empirical evidence makes it challenging for the complexities of sustainable adoption of e-health tools for DMHS delivery to be understood within SA HEIs. Researchers believe that additional studies are necessary due to the nascent nature of the adoption of e-health tools for DMHS (Fagherazzi et al. 2020:6; Kowatsch, Otto, Harperink, Cotti & Schlieter, 2019:260). It is on this premise that this study aimed to develop a framework for the sustainable adoption of e-health tools for DMHS in a selected SA university. The development of the framework would contribute to the long-term continuous provision of DMHS, reduce the impact of mental health challenges in the workplace and enhance access to mental health care for the university staff.

1.2 Research problem statement

Prior to the COVID-19 pandemic, university staff in SA HEIs were confronted with a growing number of mental health issues, which hindered their ability to work efficiently. Factors such as increased student enrolments, reduced job autonomy, increased pressure to improve national and international research publications, demands related to postgraduate supervision, ineffective leadership and management, and increased administrative responsibilities among others are contributing to mental health problems in the SA HEIs (Kinman & Johnson, 2019:159; Gie et al. 2017:11; Barkhuizen et al. 2014:9; Bezuidenhout & Cilliers, 2010:1). Those who seek help face challenges such as stigma, confidentiality issues, shame and discrimination, while barriers to access mental health services impact the overall mental health and wellbeing of the university staff (Willie, 2017:2; Lund et al. 2012:404; Saxena & Skeen, 2012:397; Kakuma et al. 2010:122). The recent COVID-19 pandemic exacerbated the situation resulting in additional mental health concerns for the university staff (Zhang et al. 2020:2; Allen et al. 2020:233). Furthermore, concerns arose that the post-COVID-19 work environment would significantly change for the university staff and adapting to these changes could further increase psychological distress (Inchausti et al. 2020:6). The post-COVID-19 era accentuated the critical role of e-health in ensuring accessible and flexible mental health support, particularly for university staff facing evolving work dynamics. The COVID-19 pandemic has also made it essential to adopt e-health

tools to provide mental health services to the university staff in SA universities to mitigate these issues. While e-health tools facilitated digital mental health care and enabled university staff to cope with the heightened complexities from the 2020 – 2022 academic period, the main problem is a lack of empirical evidence concerning the sustainable adoption of e-health tools in delivering DMHS in SA universities. This has led to a lack of understanding regarding how to progress in delivering digital DMHS, at a selected university from 2020 to 2022. Based on this premise, the aim of this study is to develop a framework for the sustainable adoption of e-health tools that will enable the selected university to provide DMHS to the university staff.

1.2.1 Main problem statement

Due to the lack of empirical evidence concerning the sustainable adoption of e-health tools in delivering DMHS in SA HEIs, particularly during COVID-19, there is a significant gap in knowledge on how to progress towards the delivery of DMHS. To address this, a case of a selected university in Cape Town, SA from 2020 to 2022 was utilised.

1.2.2 Sub-problem statement 1

Due to the main problem, there is limited understanding of the impact of factors that influence the sustainable adoption of e-health tools in delivering DMHS on strategies for their sustainable adoption to deliver DMHS in SA HEIs. As a result, it is still unclear what factors influence the sustainable adoption of e-health tools in SA HEIs which may influence the development and implementation of effective strategies for their sustainable adoption in delivering DMHS.

1.2.3 Sub-problem statement 2

Due to the main problem, there is a lack of clarity on what the future holds in the post-COVID-19 work environment given that public health is predicted to be digital (Fagherazzi et al. 2020:6; Rudd & Beidas, 2020:2; Bierbooms et al. 2020:2). This makes it necessary to understand how the experiences gained during the COVID-19 pandemic will impact the sustainable adoption of e-health tools in delivering DMHS in the future.

1.2.4 Sub-problem statement 3

Due to the main problem, factors that influence university staff to adopt e-health tools in delivering DMHS in SA HEIs remain unknown. As a result, there is a need to identify and understand these factors to improve the current state of the adoption of e-health tools.

1.2.5 Sub-problem statement 4

Due to the main problem, the shift from traditional (face-to-face) mental health services to digital platforms has given rise to problems relating to the alignment and integration of services given the differences between the two approaches (Graham et al. 2020:1080). As a result, it appears that sustainability has remained a challenge even though some SA HEIs have adopted e-health tools to deliver DMHS.

1.3 Research questions

The following are key questions formulated to address the main problem and sub-problems of this research study:

1.3.1 Main research question

How can the selected SA university ensure sustainable adoption of e-health tools to deliver DMHS to the university staff?

1.3.2 Research sub-question 1

Is there a significant relationship between the factors that influence the sustainable adoption of e-health tools in delivering DMHS in a selected SA university and strategies for their sustainable adoption in delivering DMHS?

1.3.3 Research sub-question 2

Is there a significant relationship between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in a selected SA university?

1.3.4 Research sub-question 3

Is there a significant relationship between the current state of adoption of e-health tools in delivering DMHS in a selected SA university and factors that influence the sustainable adoption of these tools in delivering DMHS?

1.3.5 Research sub-question 4

Is there a significant relationship between the current state of adoption of e-health tools in delivering DMHS in a selected SA university and strategies for their sustainable adoption?

1.4 Research objectives

To address the research problems, the following research objectives were set:

1.4.1 Main objective

To develop a framework for the sustainable adoption of e-health tools that will enable the selected university to provide DMHS to the university staff.

1.4.2 Sub-objective 1

To investigate whether a positive relationship does exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS in a selected SA university and strategies for their sustainable adoption.

1.4.3 Sub-objective 2

To investigate whether a positive relationship does exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS at a selected SA university.

1.4.4 Sub-objective 3

To investigate whether a positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS at a selected SA university and factors that influence their sustainable adoption.

1.4.5 Sub-objective 4

To investigate whether a positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in a selected SA university and strategies for their sustainable adoption.

1.5 Hypotheses

The study aimed to address the following hypotheses:

1.5.1 Hypothesis for sub-problem 1

H_0: A positive relationship does not exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS at a selected SA university and strategies for their sustainable.

H_1: A positive relationship does exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS at a selected SA university and strategies for their sustainable adoption.

1.5.2 Hypothesis for sub-problem 2

H_0: A positive relationship does not exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS at a selected SA university.

H_1: A positive relationship does exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS at a selected SA university.

1.5.3 Hypothesis for sub-problem 3

H_0: A positive relationship does not exist between the current state of adoption of e-health tools in delivering DMHS at a selected SA university and factors that influence their sustainable adoption.

H_1: A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS at a selected SA university and factors that influence their sustainable adoption.

1.5.4 Hypothesis for sub-problem 4

H_0: A positive relationship does not exist between the current state of adoption of e-health tools in delivering DMHS at a selected SA university and strategies for their sustainable adoption.

H_1: A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS at a selected SA university and strategies for their sustainable adoption.

1.6 Delimitation of the research

An important component of any study is defining its boundaries and scope to ensure it remains focused, feasible and achievable within the given time and resources (Brynard & Hanekom, 2006:12). To maintain focus and manageability, the study was confined to a single public university in Cape Town, SA where contact-based teaching and learning between staff and students is the primary mode of delivery. The study focused on three occupational groups which are management, academic and non-academic staff from 2020 to 2022 at the selected university.

1.7 Research methodology

The study adopted a case study, focusing on a single university located in Cape Town, SA. The case study was complemented by a survey, employing quantitative research methods within a positivist research paradigm to explore the sustainable adoption of e-health tools in delivering DMHS. A deductive research approach guided hypotheses development and its empirical testing process. Using a voluntary response sampling technique, 348 participants completed an online survey on Microsoft Forms and data was subsequently processed using SPSS version 28 and AMOS 29. Data analysis involved frequency distribution, descriptive statistics, EFA, CFA, and SEM.

Several ethical considerations were rigorously upheld throughout the study including obtaining informed consent, securing permission to conduct the research, ensuring anonymity and confidentiality, avoiding harm to the respondents, maintaining honesty in presenting study results and implementing a data management plan. Chapter Six details the research methodology and further elaborates on each ethical consideration.

1.7.1 Literature review

This study reviewed a plethora of literature in four chapters, covering the following:

- The context of mental health in SA public HEIs.
- The concept of e-health tools and DMHS.
- The concept of sustainability and strategies for the sustainable adoption of e-health tools.
- Theoretical and conceptual framework for the sustainable adoption of e-health tools.

Drawing on the extensive literature review, a conceptual framework was constructed as illustrated in Figure 1.1 below. Its purpose was to serve as a guide for empirically testing the hypotheses of the study.

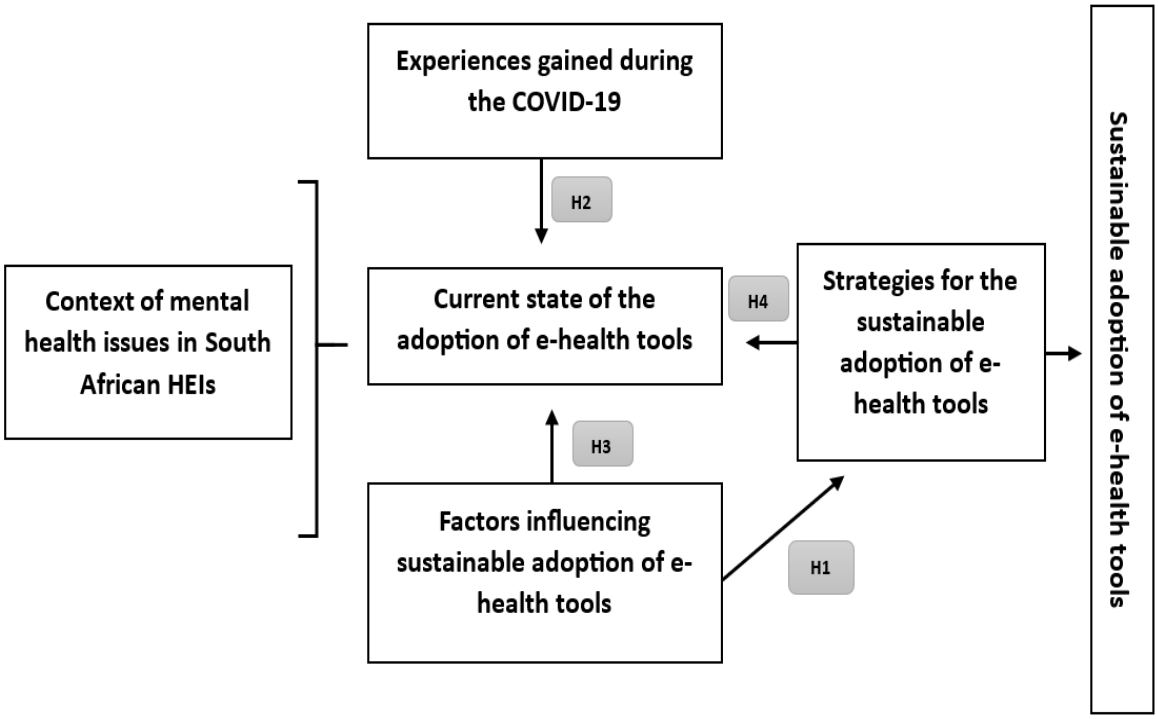


Figure 1.1: Conceptual framework for the sustainable adoption of e-health tools

Source: Author's construction based on literature review

1.8 Clarification of key concepts

It is evident from the literature that diverse social science perspectives share comparable understandings of the key concepts of sustainable adoption of e-health tools in the delivery of DMHS, although interpretations and applications vary. Therefore, to achieve its purpose, this study defines the following key concepts:

1.8.1 DMHS

Barak, Klein and Proudfoot (2009: 5 – 14) define DMHS as "mental health services delivered via the internet and through e-health tools and these include web-based interventions, online counselling and therapy, internet-operated therapeutic software and other online activities".

1.8.2 E-health tools

Gooding (2019:1) defines e-health as “a broad category of health-related ICT-based tools that process information electronically and are utilised to support and care for patient’s mental health care”. It includes the utilisation of multiple ICTs tools to support the delivery of DMHS in personalised or group mental health initiatives.

1.8.3 Mental health

Mental health is not only the “absence of mental illness” but a state of wellbeing where an individual understands their own capabilities and potential, effectively manages everyday challenges and stresses, performs productively and contributes meaningfully to their lives and more importantly engages actively in society (WHO, 2001:1).

1.8.4 Sustainable adoption of e-health tools

In this study, sustainable adoption of e-health tools refers to the university capacity to provide ongoing DMHS that benefits university staff over a long period through e-health tools, while still being able to address future mental health needs.

1.9 Significance and contributions of the research study

Five-fold contributions in the form of practical, theoretical, empirical, methodological and contextual contributions are made in this study. Although Chapter Ten provides more detailed information, the following is an overview of the significance and contributions of this research study:

1.9.1 Practical contribution

A significant practical contribution is made to address the dearth of academic research studies on the sustainable adoption of e-health tools for DMHS in SA HEIs. As a result, this fills a gap in scientific evidence by providing a framework for the sustainable adoption of e-health tools which potentially may be applicable to similar university contexts.

1.9.2 Methodological contribution

Previous studies applied qualitative and theoretical research methods in exploring the sustainability of e-health tools for DMHS (Van Velthoven & Cordon, 2019: 1 – 6; Fagherazzi et al.

2020: 1 – 6). However, there is a scarcity of studies utilising quantitative research methods in this area. In this regard, the study contends for the importance of utilising and employing quantitative research methods that are both objective and measurable (Quinlan et al. 2015:55; Bryman & Bell, 2011:17). In doing so, it generates new insights and a better understanding of the social environment within a selected SA university. Thus, this research study makes a methodological contribution by addressing a notable research gap.

1.9.3 Empirical evidence contribution

Further to the above, this research study makes an important empirical evidence contribution by means of providing evidence-based knowledge on the sustainable adoption of e-health tools for the delivery of DMHS. This contributes to the need for empirical data to inform policy decisions which enhances policymakers' abilities to make informed decisions on how technology-driven tools impact the delivery of DMHS. Moreover, empirical evidence of this study bridges the gap between theory and practice, which could ultimately contribute to improved mental health services. Thus, this study can significantly advance the achievement of SDG 3 of the UN, which seeks to ensure healthy lives and promote well-being for all at all ages.

1.9.4 Contextual contribution

The research study is also significant as it fills a contextual research gap by focusing on the sustainable adoption of e-health tools for DMHS at a selected SA HEI. In doing so, it contributes to addressing the oversight of previous studies that primarily focused on European contexts (Van Velthoven & Cordon, 2019: 1-8). This study provides applicable insights and guidance for diverse contexts, including a selected SA university and policymakers, on how to sustainably adopt e-health tools for DMHS.

1.9.5 Theoretical contributions to Human Resource Management

It is evident that the study contributes to the advancement of knowledge and practice in Human Resource Management (HRM) specifically in relation to wellness within the South African Board for People Practices (SABPP) standards model, effectively filling a critical gap in the adoption of e-health tools for DMHS in SA HEIs. The study provides empirical evidence on the factors influencing the adoption of these tools and develops a framework to ensure their long-term implementation. This contributes to HRM by offering strategic insights into improving employee well-being, engagement, and productivity in university settings.

1.10 Summary and outline of the thesis

The ten chapters of the study are organised sequentially, each exploring a different aspect and building on the preceding one. Thus, guiding readers towards a better understanding of the study. Below is what each chapter contains:

Chapter One: This chapter served as a foundation by introducing the topic, providing context, and outlining the structure of the study. In essence, this chapter outlined the main aim of the study, research objectives, research questions and the hypotheses that underpinned the research. In addition, the chapter provided a brief overview of the research methodology employed and explained the boundaries and scope of the research. Furthermore, an overview of how the literature review was presented along with a clarification of the key concepts of the study. Finally, it concluded with an overview briefly explaining the significance and contributions of the study.

Chapter Two: Although this study presents an extensive literature review in four chapters, Chapter Two contextualises mental health in SA public HEIs, including a brief historical perspective. It features a case study to introduce the university under investigation and explores the roles and responsibilities of university staff, linking their work to mental health issues. The chapter also discusses some of the factors contributing to mental health issues faced by university staff which shed light on how mental health concerns manifest in SA HEIs. Finally, it discusses the mental health concept, including benefits, common disorders, barriers to workplace support, management of mental health disorders, and consequences of poor mental health.

Chapter Three: This chapter expounds on the concept of e-health tools and DMHS including various forms and different types of DMHS. It also broadly discusses digital mental health responses during the COVID-19 pandemic at University X, herein the university under investigation. The chapter further discusses the utilisation of e-health tools and user experiences gained during the pandemic by drawing lessons from other studies in which e-health tools were used to deliver DMHS.

Chapter Four: Chapter Four discusses the concept of sustainability and strategies for adopting e-health tools for DMHS. It details the benefits of sustainable adoption and explores the challenges within economic, social, environmental, and technical pillars. The chapter also provides strategies for sustainable adoption in SA HEIs.

Chapter Five: The theoretical and conceptual framework for the study is the focus of this chapter. It starts by discussing the main theories and frameworks that serve as the foundation for investigating and understanding the sustainable adoption of e-health tools. Thereafter, a conceptual framework is presented and explained. This serves as the basis for developing and testing the study hypotheses.

Chapter Six: Chapter Six provides a detailed explanation of the research methodology used in the study which helps to understand how the researcher arrived at the conclusions. Hence, the chapter begins by revisiting the research objectives and then covers the research design, paradigm, methods, population, sampling, data collection instrument and procedures, data analysis and ethical considerations.

Chapter Seven: This chapter presents the study findings in detail, employing various means of data presentation. The research findings are presented progressively in a step-by-step manner, starting with frequency distribution, progressing through descriptive statistics, EFA, reliability and validity analyses, CFA, SEM and hypotheses testing.

Chapter Eight: Discussions of the research findings are provided in Chapter Eight, focusing on demographic information, measures of central tendencies and variability of the observed values, identified factors, and lastly hypotheses testing. The quantitative discussion provides evidence-based conclusions for this study.

Chapter Nine: The proposed framework will be presented and discussed in Chapter Nine. This will include details of how the sustainable adoption of e-health tools would enable the selected university to deliver DMHS to university staff. The framework draws largely on research findings discussed in Chapter Eight and brief additional perspectives provided by the reviewed literature.

Chapter Ten: This chapter concludes the study by summarising the research objectives and briefly explaining how each one of them was met. Subsequently, recommendations are provided in light of the research findings and the discussions provided in Chapters Seven and Eight. Next, the chapter highlights the significance and contributions, acknowledges limitations, and reflects on their impact on the findings and conclusions. It also discusses practical implications and makes several suggestions for future research explorations.

CHAPTER TWO

CONTEXTUALISING MENTAL HEALTH IN SOUTH AFRICAN PUBLIC HIGHER EDUCATION INSTITUTIONS

2.1 Introduction

Chapters Two, Three, Four, and Five provide an extensive literature review which focuses on presenting and conceptualising key constructs of the study, familiarising with relevant issues, and positioning the research within existing knowledge as outlined by Grinnell and Unrau (2005:424) and cited in de Vos, Strydom, Fouche and Delpot (2011:109). The review commences by contextualising the concept of mental health and SA public HEIs. This is particularly significant because mental health is a complex concept that is influenced by various factors, and SA public HEIs have their own unique set of characteristics and dynamics.

Given the above context, this chapter begins by providing the context of SA public HEIs including a brief historical overview. This provides a basis for understanding the current landscape in SA HEIs and its implications on the mental health of university staff. The next section features a case study to introduce the university under investigation. This overview also serves as the foundation for exploring the unique challenges faced by SA public HEIs in the current HE work environment. Following this, the study discusses the roles and responsibilities of university staff to draw the link between their duties and the mental health issues they encounter in the workplace. The subsequent section contextualises SA public HEIs by discussing factors contributing to the mental health issues faced by university staff which enhances the understanding of how these concerns manifest in HEIs. After that, the study contextualises the concept of mental health, and explores its benefits, common disorders, workplace barriers to accessing care, management of common disorders and the consequences of poor mental health.

2.2 Context of SA HEIs

Change is an ever-present and crucial part of any organisation. It has been reported that HEIs have undergone intensive and widespread changes in the past 20 years which has consequently affected the university staff's mental health (Kinman & Johnson, 2019:1). While university staff face mental health issues, it is argued in this study that HEIs in SA face enormous risks in their quest to achieve their institutional visions and missions. Hence, before exploring the issues confronting university staff in HEIs, it is necessary to generate broad insights about the unique

(contextual) elements of HEIs that may help build a context for the research study. This section therefore outlines the nature and purpose of HEIs, a historical overview of SA HEIs including the case study of the selected SA HEI. It also explains the roles and responsibilities of university staff. These explanations lead to a discussion regarding mental health and related issues within HEIs.

2.2.1 The nature and purpose of HEIs

In general, HE refers to the type of education that follows the completion of secondary education. It is made up of a wide range of tertiary institutions including universities, colleges, trade schools, technical institutions and other career-based institutions that provide different post-secondary education. HEIs, whether private or public, focus on diverse methods of teaching, learning, and research to prepare students for a wide range of roles in society or industry (Ford, 2017:571). This study particularly focuses on SA public universities that offer contact-based teaching and learning, which will be referred to as SA HEIs throughout the study. Universities are among the world's oldest institutions of higher learning (Ford, 2017:560). As a result, SA HEIs play an important role in advancing research, teaching, and learning, making them a cornerstone of society.

In society and industry, HEIs serve several functions. Melo, Sarrico and Radnor (2010:236) suggest a systems approach to HE to effectively comprehend their purpose. The authors regard HE as a process that transforms inputs (students, academics, equipment and facilities) into outputs which can generally be categorised as teaching and learning, research, and community engagement. From this perspective, HEIs are responsible for preparing graduates, conducting quality research and ensuring a well-educated society. Therefore, they play a vital role in promoting academic scholarship and intellectual activities in all aspects of human knowledge, through their core functions of teaching, learning, and research.

Nations around the world are attempting to improve their capacity through the development of new knowledge and competent human capital (Ylijoki, 2013:242). The goal is to create a more competitive workforce that provides the necessary skills and capabilities to drive innovation and economic growth. In SA, HEIs serve to meet society's development demands by providing adequate and skilled human capital for the economy (Department of Education, 1997:7). Therefore, they are crucial for equipping individuals with the skills needed to contribute to the development of the SA economy. Ylijoki (2013:242) elaborates further and states that HEIs contribute significantly to a country's prosperity through developing intellectual capital, enhancing

economic growth, encouraging personal development, and enhancing innovation. Pouris and Inglesi-Lotz (2014:1) concur, adding that in overall, HEIs contribute to social and sustainable development in the following ways: human capital development, research and development, knowledge distribution and usage and knowledge maintenance.

Other scholars believe that HEIs contribute to a country's global competitiveness and development, which is primarily influenced by its people's access to a high-quality and sustainable HE system (Barkhuizen, Roodt & Schutte, 2014:2033). This suggests that HEIs must develop the high-level skills required to sustain economic growth through a high-quality HE system. This is particularly significant since high-level competencies and knowledge are necessary for today's technologically advanced society (Badat, 2010: 10-11).

HEIs also equip individuals to maximise their abilities and personal growth opportunities (Department of Education, 1997:7). The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2022.n.p) supports this viewpoint by noting that HEIs are significant stakeholders in promoting lifelong learning. They further explain that HEIs have distinct abilities to develop and nurture students. Additionally, they can mobilise educational resources and provide educational experiences for a diverse group of people.

In SA society, HEIs are thus significant to ensure employment prospects and act as a vital mechanism for fairness in the distribution of opportunities and accomplishments (Department of Education, 1997:7). Considering the historical inequalities in SA HEIs during the apartheid era, these issues remain critically relevant in the contemporary SA society. Therefore, it is fair to state that HEIs are knowledge-producing institutions with societal duties in terms of social, cultural, philosophical, political, and economic well-being. Thus, HEIs are expected to facilitate social justice, effectively contribute to sustainable development, and strive to ensure inclusivity in HE.

2.2.2 Historical overview of SA public HEIs

In 1994, SA had 36 public HEIs that comprised 21 public universities and 15 technikons (Badat, 2010: 10). These institutions all varied in terms of government funding received, academic quality, and adequacy of infrastructure and facilities (Badat, 2010:10). Waghid (2015:2) asserts that the SA HE system was fundamentally shaped by racial discrimination, with each institution experiencing some form of institutional exclusion, and marginalisation of Blacks, Coloureds and Indians. To put it differently, Lange (2012:46) explains that before 1994, the SA HE system was separated along racial, ethnic, linguistic and geographical lines. In 1997, however, the

Department of Education (DoE) issued White Paper 3: A Programme for Higher Education Transformation, which overhauled and transformed the HE system into a single, nationalised system. The programme intended to remove fragmentation, rectify past inequalities and inefficiencies stemming from the apartheid government, and create a learning society that would unlock the creative and intellectual potential of all social groups to achieve reconstruction and development goals (DoE, 1997:3). Adapting to new realities and opportunities through transformation was also a priority for the new democratic country (DoE 1997:3).

The current SA HE landscape consists of traditional universities, comprehensive universities, and universities of technology. In addition to these institutions, other HE institutes include Technical and Vocational Education and Training (TVET) colleges, Community Education and Training (CET) colleges, private HEIs, private skills development institutions and various institutions at government-affiliated colleges. These institutions are scattered throughout SA's nine provinces. It has been reported that in 2019 there were 503 registered and established Post School Education and Training (PSET) institutions in SA (DHET, 2021:19). These comprise 26 public HEIs, 131 registered private HEIs, 50 TVET colleges, 287 registered private colleges and 9 CET colleges. As mentioned earlier, the focus of this study is on SA public HEIs (universities) that offer contact-based teaching and learning. All 26 public universities offer various programmes and conduct world-class research in many fields to enhance teaching and learning while addressing the difficulties that SA and the rest of the world confront. As such, these public universities are integral to SA's future, providing valuable resources to cultivate the knowledge and skills needed in the country.

As part of the new HE system, all SA HEIs are required to admit students of all races (Badat, 2010:11). Moreover, SA HEIs are expected to transform the curriculum and become more locally relevant while remaining geared to a knowledge-driven environment. Furthermore, increasing student enrolment and enhancing access to HE for previously disadvantaged people is generally viewed as critical to resolving apartheid inequities, building a stable society, and developing the high-level skills required to sustain economic growth (Badat, 2010:11). Thus, SA HEIs are expected to remain flexible and responsive to the changing needs of society to maintain their relevance in future.

2.2.3 The case study: A selected SA university

For ethical reasons, the identity of the selected SA HEI at the centre of this study will not be revealed and it will be referred to as University X. This section starts by providing a historical overview of the selected SA university which is then followed by a current contextual overview. The historical information about the selected SA university investigated in this study was obtained from its website and (University X, n.d.) will be used to reference and acknowledge the source of information.

University X was founded on 1 January 2005, when two Technikons in the Western Cape were merged (University X, 2024). The merger was part of a nationwide transformation that changed SA HE. Currently, University X is the Western Cape's largest university of technology. It has 5 campuses, 30 000 students across its 6 faculties and offers more than 70 programmes. University X has a long history that dates back to the 1900s when there were two separate institutions before the merger in 2005. These two institutions will be referred to as Technikon A and Technikon B for ethical reasons. The merger of Technikon A and Technikon B marked the establishment of University X, a beacon of knowledge and research in the Western Cape that has since grown exponentially.

Technikon A began as a Technical College on Longmarket Street in 1920 (University X, 2024). The establishment of Technikon A followed 10 years of community agitation for the convergence of technical courses previously delivered across a variety of sites in Cape Town. In the late 1960s, the institution was renamed the College for Advanced Technical Education. However, 10 years later, the Technikons Act of 1993 (No. 125 of 1993) was passed, and the institution became Technikon A, which then permitted it to provide degree programs. During the apartheid era, all HEIs were required to… "provide courses for white students"; but, in 1987, the enrolments shifted when the institution sought and was given permission to repeal the government's black student quota (University X, 2024). The 1990s marked the beginning of an unprecedented era for Technikon A, which introduced a revised organisational structure with six faculties, a revamped corporate brand, and a revised vision and purpose statement. Two colleges were merged into Technikon A in 2001 to become the Faculty of Education.

Technikon B was established in 1962 (University X, 2024). It was founded to respond to the constant increase in Coloured apprentices in a range of industries. In the 1970s, the institution's status was altered to a College of Advanced Technical Education. It was later renamed Peninsula

College for Advanced Technical Education. This name and status change was however short-lived, and the institution was formally established as Technikon B in 1979. Initially serving as an educational institution for Coloured people during the pre-democracy era, the school opened its doors to all races in 1987. Technikon B's academic programmes were restructured in 1997, along with the establishment of the Engineering, Business, and Science faculties. This transition was a reflection of the new democracy in SA. Technikon B became a well-recognised institution for its progressive and innovative educational approach (University X, 2024).

According to Gie (2017:72), when University X was formally established on 1 January 2005, its vision was, "To be the heart of technology education and innovation in Africa." However, this has been changed in line with its new Strategic Plan, Vision 2030 which is premised on the idea that "Smartness" must be embedded into every operational aspect of their core work (University X Annual Report, 2021:ii). The revised vision statement reads:

"University X is Africa's leading Smart University of Technology, globally renowned for innovation, with graduates that shape a better world for humanity".

The mission of University X is to transform students, "through world-class researchers who inspire knowledge production and innovation that are cutting edge" (University X Annual Report, 2021:ii).

University X is supported by the core values listed below to realise its vision and purpose:

- "Embracing a culture of Ethics and Integrity
- Seeking Kindness and showing compassion (human heartedness) for the well-being of all our students, staff, stakeholders and the University X community, as expressed in ubuntu as a way of living;
- Embracing Restoration as we deal with the legacy of our past and as we redress issues of equality, gender-based violence, and any form of discrimination;
- Being a testimony of Unity (ubunye), whilst embracing diversity (ukungafani) in all its forms by being honest, transparent, credible and respectful;
- Showing Passion and demonstrating enthusiasm, devotion, intensity, tenacity and total commitment to everything that we undertake as a university of technology; delivering uncompromising quality service, and always searching for better ways of doing things;
- Taking Accountability and accepting responsibility for all our actions and the actions that we commit to;
- Being Technologically Astute and embrace and take ownership and experiment with the possibilities technology offers".
  (University X Annual Report, 2021:98).

As previously stated, all SA HEIs are required to open their doors to students of all races under the reformed HE system (Badat, 2010:11). This study notes that University X complies with these national requirements, as evidenced by their student enrolment trends shown in Table 2.1 below. The table illustrates that the university has steadily increased Black, Indian, and Coloured student enrolment over the past five years. It appears that the university is aggressively seeking to diversify its student body, which is consistent with the national mandate requiring HEIs to admit students of all races.

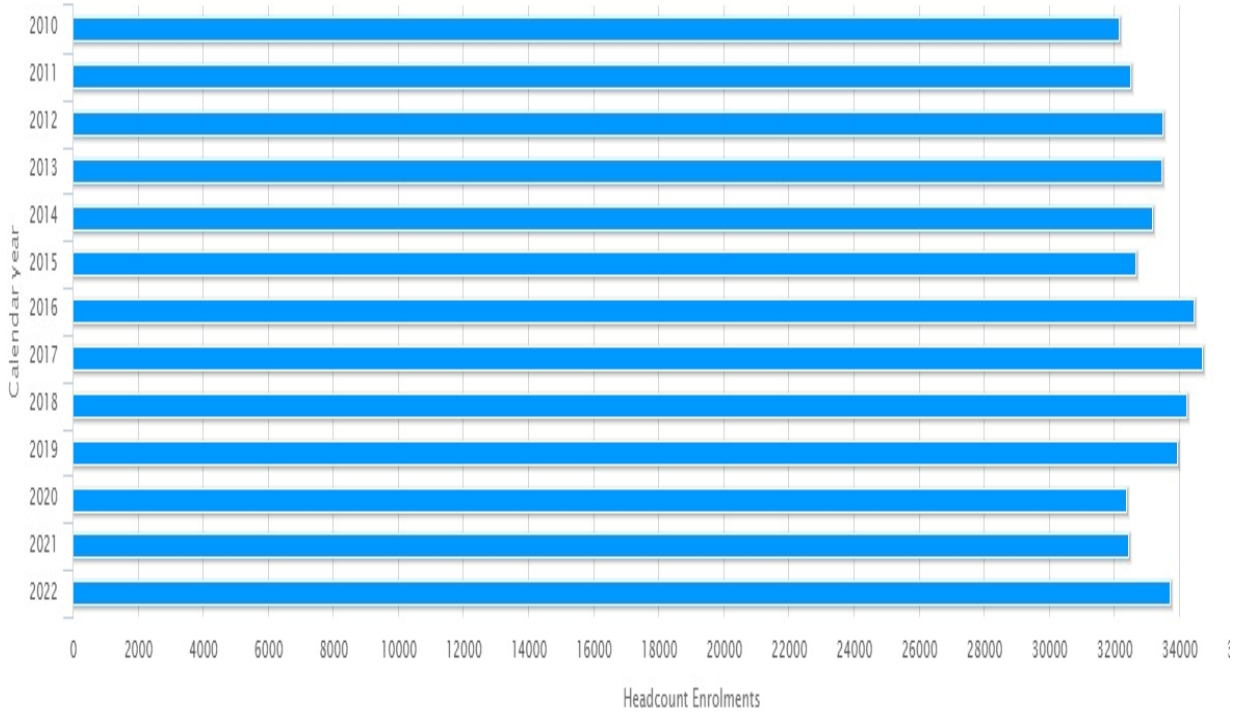


Figure 2.1: Student headcount enrolments numbers 2010-2022

Source: University X (n.d.)

The student enrolment figures reflected above align with earlier studies, which indicated that since University X officially started on January 1, 2005, enrolment has risen to over 30,000 students (Gie, 2017:72). However, as shown in Table 2.1 below, University X's actual headcount enrolment remained relatively stable ranging between 33 941 and 32 429 over the past three years (2019–2021). In light of this, the University X Annual Report (2021:14) indicated a 5% and 12% decrease in overall headcount enrolment reflecting a shortfall in meeting enrolment targets.

Table 2.1: Student enrolment trends

	2019		2020		2021		2022	
	Headcount	% of Total	Headcount	% of Total	Headcount	% of Total	Headcount	% of Total
Gender	33 941	100.00%	32 383	100.00%	32 429	100.00%	33 716	100.00%
Female	18 889	55.65%	18 107	55.92%	18 466	56.94%	19 564	58.03%
Male	15 052	44.35%	14 276	44.08%	13 963	43.06%	14 152	41.97%
Race	33 941	100.00%	32 383	100.00%	32 429	100.00%	33 716	100.00%
African	23 014	67.81%	22 625	69.87%	23 429	72.25%	25 117	74.50%
Coloured	8 341	24.57%	7 621	23.53%	7 159	22.08%	6 925	20.54%
Indian	281	0.83%	234	0.72%	209	0.64%	199	0.59%
No Information	17	0.05%	15	0.05%	31	0.10%	60	0.18%
White	2 288	6.74%	1 888	5.83%	1 601	4.94%	1 415	4.20%
Qualification Level	33 941	100.00%	32 383	100.00%	32 429	100.00%	33 716	100.00%
Occasional	131	0.39%	117	0.36%	97	0.30%	119	0.35%
Post Graduate	2 268	6.68%	2 131	6.58%	1 904	5.87%	2 273	6.74%
Under Graduate	31 542	92.93%	30 135	93.06%	30 428	93.83%	31 324	92.91%

Source: University X (n.d.)

Regarding staff headcount, University X had 2836 permanent staff in 2019 as shown in Table 2.2 below. It is also evident that as student enrolment increased as shown in Table 2.1 below, the staff headcount rose as shown in Table 2.2 below. In 2017, University X had 2976 permanent employees, the highest number recorded from 2014 to 2019. One probable explanation for this trend is that a significant portion of university staff, particularly academic staff, are nearing retirement age and consequently SA HEIs need to recruit new talent to fill their positions (HE SA, 2011). Musakuro and de Klerk (2021:11) reported that such difficulties present a risk in talent management practices, and SA HEIs are recommended to implement succession planning systems to ease the transition when university staff retire. Therefore, HEIs in SA need to take proactive steps to mitigate risks associated with sudden staff departures, to ensure successful talent management practices.

Table 2.2: Permanent staff headcount: 2014 – 2019

Display	2014		2015		2016		2017		2018		2019	
	Staff Head count	Staff Headco unt%C	Staff Head count	Staff Headco unt%C	Staff Head count	Staff Headco unt%C	Staff Head count	Staff Headco unt%C	Staff Head count	Staff Headco unt%C	Staff Head count	Staff Headco unt%C
Crafts/trades	11	0.6%	9	0.5%	8	0.3%	8	0.3%	12	0.4%	12	0.4%
Executive/admin./mgmt. professional	58	3.0%	58	2.9%	62	2.4%	54	1.8%	63	2.2%	62	2.2%
Instructional/research professional	774	39.9%	807	40.6%	842	32.3%	843	28.3%	804	27.8%	776	27.4%
Non-professional administration	599	30.9%	635	32.0%	671	25.8%	652	21.9%	577	19.9%	580	20.5%
Service	149	7.7%	140	7.0%	689	26.4%	1 095	36.8%	1 094	37.8%	1 071	37.8%
Specialised/support professional	207	10.7%	202	10.2%	200	7.7%	186	6.3%	218	7.5%	203	7.2%
Technical	140	7.2%	135	6.8%	133	5.1%	138	4.6%	128	4.4%	132	4.7%
Total	1 938	100.0%	1 986	100.0%	2 605	100.0%	2 976	100.0%	2 896	100.0%	2 836	100.0%

Source: University X (n.d.)

2.3 Roles and responsibilities of university staff

A key aspect of this study is gaining an understanding of the roles and responsibilities of university staff, as it provides insights into their duties within the HE workplace. It also helps to draw connections between their work and the mental health issues they experience in the workplace. University staff are categorised into three groups: management, academic, and non-academic staff, and they can be employed on a permanent or contract basis. Collectively, university staff contribute both directly and indirectly to ensuring their institutions achieve their vision and mission. It is also worth noting that researchers such as Gie (2017:9) argue that all university employees at SA public HEIs with contact methods of delivery employ the same categories of employees, including management, academic, and non-academic staff. The researcher further elaborates that these university employees share comparable characteristics and similar characteristics and experience comparable levels of well-being within the HE work environment. Thus, it can be argued that university staff such as management, academic, and non-academic staff share the same mental health attributes, as noted in previous research (Gie, 2017:9).

2.3.1 Management staff

Management staff refer to university leadership employees responsible for overseeing strategic and operational matters (University X Annual Report, 2021:19). For the selected SA HEI, management staff are split into two groups: Executive Management and Management Committees (University X, 2024:n.p). Examples of executive management staff include the vice-chancellor, deputy vice-chancellors, executive directors, and the registrar. Examples of

Management Committees include the deans of faculties, the dean of students and the senior director for computer and telecommunication services. According to University X (2022:n.p.), the Management Committee is responsible for carrying out the strategic plan as well as implementing Council decisions and institutional policies. Moreover, it is also the decision-making body for staff-related issues. It also oversees processes that support Council-approved policies, organisational structure modifications and revisions, matters beyond the delegated authority of line managers, and the review of performance management reports. Additionally, it serves as the decision-making body for staff-related issues.

2.3.2 Academic staff

Academic staff commonly referred to as faculty staff are also part of university employees, and they have a variety of roles and responsibilities that extend beyond teaching (Qwabe, 2016:15). Pienaar and Bester (2008:32) posit that academic staff are essential to the core operations of every HEI, and no institution of higher learning can truly achieve success unless they have well-qualified and dedicated academic staff. This implies that HEIs are more reliant on intellectual abilities as well as the commitment of their academic staff. The academic staff hierarchy has several categories, including department heads, professors, associate professors, senior lecturers, junior lecturers, and post-graduate fellows.

Academic staff deliver lectures to both undergraduate and postgraduate students across various faculties, fulfilling the teaching and learning responsibilities of their role (Jacob, Jegede & Musa, 2021:232). Academic staff are responsible for developing content for subjects or modules in line with university guidelines. They also develop learning materials for active learning and support students facing difficulties in the classroom by identifying those at risk (Jacob et al. 2021:232). Additionally, they further develop intervention measures in a timely manner. Other teaching and learning responsibilities include curriculum development and assessments, accreditation, internal and external moderation and quality assurance (Cebrián, Grace & Humphris, 2015:85). In addition, academic staff contribute to faculty and departmental administration.

Barkhuizen, Rothmann and Van De Vijver (2014:323) assert that it is also a primary responsibility of academic staff to conduct research and publish high-quality papers in accredited journals yearly. Qwabe (2016:17) elaborates that academic staff must be actively engaged in research activities to generate original knowledge through their research outputs. Apart from that, academics frequently write books and, in some cases, book chapters. This practice is crucial for

showcasing the latest advancements in their field. Moreover, peer review by other experts helps ensure the highest quality of their studies. Luzipho, Joubert and Dhurup, (2023: 6) state that academic staff are expected to attend national and international conferences in addition to supervising postgraduate students (master's, doctoral and post-doctoral). Academic staff also plan and organise research workshops, conferences, seminars and symposiums. In some HEIs, academic staff undertake fundraising duties for research projects and initiatives (Aleixo, Leal & Azeiteiro 2018:1669).

According to Pereira (2017:362), some academic staff, particularly senior lecturers, take on leadership roles in accredited journals, such as serving on the editorial team or as the editor-in-chief. Additionally, some academic staff act as journal reviewers, providing feedback on submitted papers, suggesting improvements, and advising the editor on whether to accept, reject or request revisions to the papers (Heddle & Ness, 2009:2265). Reviewers are not compensated for their work, but they are essential for ensuring the quality and accuracy of published research (Heddle & Ness, 2009:2265). They are also an important part of the research process, helping to shape the academic discourse and ensuring the integrity of the published work.

In addition to the above, academic staff are also expected to provide scholarly leadership and service within their departments, and faculties, and, in some cases, extend their contributions to society and industry (Aleixo, et al. 2018:1669). This implies that academic staff assume leadership roles, either as a chairperson or as a member of established committees within their respective departments, faculties, society or industry. For the selected SA HEI, examples of these committees include but are not limited to the following: Faculty Research Committee, Faculty Ethics Committee, Transformation Committees, Risk Management Committees, Language Committees, Health and Safety Committees, Curriculum Development Committees, Faculty Teaching and Learning Committees, Employment Equity Committees, Open Day Committee, Advisory Committee and many others.

Academic staff also contribute to community initiatives by integrating community services interventions into the curriculum (Jacob et al. 2021:232). Qwabe (2016:18) supports this view adding that academics are expected to collaborate with civil society and non-governmental organisations (NGOs) through community service outreach programmes to contribute towards community development, technology transfer and other exchanges of knowledge. Such collaboration serves to bridge the gap between academic institutions and local communities, making the knowledge and skills of both more accessible (Jacob et al. 2021:232).

2.3.3 Non-academic staff

Non-academic staff, also known as support staff, are university employees who hold administrative, technical, professional, or managerial positions. These non-academic staff provide secretarial, administrative, and technical assistance to the management as well as academic staff, either as part of a unit, department, faculty, team or individually. Qwabe (2016:1) states that non-academic staff assist in the administrative tasks of academic departments at HEIs, allowing academic staff to fulfil their respective tasks efficiently and without being overburdened. Furthermore, the contribution of non-academic staff in the HE workplace has a significant impact on the student experience (Lotkowski, Robbins & Noeth, 2004:23). Examples of non-academic staff include but are not limited to faculty managers, faculty officers, departmental secretaries, office administrators, librarians, technicians, electricians and many others who work in different specialised units, departments and faculties.

2.4 Factors contributing to mental health issues among university staff

Mental health issues are not caused by a single factor but by a combination of biological, psychological, and social or environmental factors (Connellan, 2021:162). Mental health issues are typically connected to the biopsychosocial model. Engel (1977:130) developed the biopsychosocial model and posits that health and illnesses are outcomes of the biological, psychological, and social context. These factors combine in complex ways to generate the result, which is a person's overall mental health. As an example, university staff might have a genetic predisposition (biology) to depression as well as high stress levels at work (HEIs) and in their families (social context), as well as psychological factors such as past trauma. While the biopsychosocial model can be useful in understanding mental issues, this study largely focuses on social and environmental factors. The main reason is that university staff spend more hours in the HE workplace, an environment that directly contributes towards employees' mental health either negatively or positively (Melzner, Heinze & Fritsch, 2014: 1357; Barkway, 2006:131). Thus, this study particularly emphasizes the importance of social factors in influencing mental health, given their direct impact on university staff's well-being. However, other external aspects are considered, for instance, COVID-19.

2.4.1 Poor workload management

The preceding section 2.3 above has revealed that university staff collectively perform a variety of roles and responsibilities and this has contributed towards an understanding of university staff

roles and responsibilities at typical universities. Building on the understanding of university staff roles and responsibilities, this section intends to draw connections between university staff's work and the mental health issues they experience. This is done through an understanding of workload management in SA HEIs.

Emerging evidence shows that HEIs generally use workload management strategies as a key factor in measuring employees' productivity (Okeke-Uzodike & Gamede, 2021:14). Despite this, workload management is subject to guidelines, such as workload models and policies. As such, scholars such as Qwabe (2016:1) contend that to promote transparency and equal work allocation, some SA HEIs have developed and implemented workload models and policies for academic staff. These models and policies are designed to ensure equitable allocation of teaching, research, and administrative tasks, thus providing a fair and balanced work environment (Okeke-Uzodike & Gamede, 2021:14). Consequently, these models and policies are aimed at enabling the staff to create a fair and balanced workspace, fostering transparency and equitable management of workloads (Qwabe, 2016:1; Okeke-Uzodike & Gamede, 2021:14).

However, Qwabe (2016:1) postulates that there appears to be scepticism expressed among different staff members because these workload models and policies have not been rigorously evaluated to determine their effectiveness in achieving the desired outcomes in SA HEIs. This scepticism is further exacerbated by the lack of evidence-based research to support the efficacy of workload models and policies in SA HEIs, especially during the COVID-19 pandemic. Moreover, Qwabe (2016:1) argues that some SA HEIs lack an effective workload model or policies at present for both academic and non-academic staff members. This is concerning considering the increasing workload of university staff in SA HEIs and the current hybrid models in use at most SA HEIs. This is even further compounded by the current electricity interruptions typically known as load-shedding and burgeoning work-from-home practices in SA. According to Vardi (2009:2), many academics are generally dissatisfied with their workload and working hours. Research by Du Plessis, Jansen van Vuuren, Simons, Frantz, Roman and Andipatin (2022:10) demonstrated the challenges of working from home. Among these difficulties are heavy workloads and high expectations from management, as well as a rapid turnaround for providing feedback to and from management. These factors combined can have a toll on the mental health of university staff since some employees must cope with other home responsibilities, including child care. Evidence shows that unreasonable workload and pressure from management can result in employees becoming stressed and alienated from their organisation (Mustapha & Ghee 2013:13). The mental health of staff can suffer due to these factors, with potential effects on their physical

health. This underscores the need for HEIs to be aware of these issues, and actively take steps to create a supportive environment for their staff.

2.4.2 Ongoing transformation

To understand the transformation of SA HEIs and its contribution to mental health issues, it is important to first clarify the term ‘transformation’. According to Du Preez, Verhoef and Simmonds (2016:1), transformation is all about change and evolution, which suggests that these elements are central to the notion of transformation of SA HEIs. Transformation has distinct meanings in different contexts and domains. For instance, Du Preez et al. (2016:1) expounded that transformation can refer to “processes of change in physics (a change of one element into another), mathematics (conversion of one figure into another of a similar value), linguistics (conversion of one syntactic form into another), biology (alteration of a cell), personality (change in character or appearance) and politics (ideologically driven change)”. Transformation, when viewed in this context, implies various things to different individuals, for different reasons. However, it is imperative to recognise that change has an impact on all aspects of society and often creates challenges and uncertainty but it also presents new opportunities to explore when managing transformation (Badat, 2010:33). Du Preez et al. (2016:1) assert that ongoing processes such as remodelling, modification and restructuring frequently accompany transformation. Moreover, it is suggested by Malabou (2008:5) that the actual change may result from a process or event occurring internally or externally. Thus, the core meaning of the term ‘transformation’ involves changing form as a result of internal or external processes or events.

In light of the above understanding of the term ‘transformation’ and relating it to SA HEIs, Du Preez et al. (2016:2) assert that transformation is primarily about establishing equitable and inclusive institutions that address the needs of the SA population while prioritising equity, access, and quality. In practice, this entails changing institutional structures, curricula, staff composition, and student demographics to address apartheid’s legacy and build a more diverse and equitable environment. Badat (2010:2) concurs with this perspective, adding that transformation involves addressing the structural and systemic barriers to access, participation and success of previously excluded and disadvantaged groups. Moreover, Badat (2010:2) regards transformation as a process that encompasses changing the structure, culture, and practices of HEIs. This is aimed at better representing and accommodating the influx of previously disadvantaged SAs. Hence, SA HEIs have experienced and continue to undergo long-term transformation.

Utilising the explanation provided above, it is important to note at the outset that the transition from apartheid to democracy marked the beginning of the institutional transformation agenda in SA HEIs (Badat, 2009:459). Thus, it is vital to comprehend HE and SA societal transformation. As explained earlier, prior to 1994, SA's HE was segregated based on race, ethnicity, language and location (Lange, 2012:46). A more precise argument is that of Kessi and Cornell (2015:1), who states that SA's HE was characterised by distinct institutions, primarily for various racial groups but predominantly for the benefit of 'white people'. However, after 1994, everything changed following a massive transformation of the HE sector owing to a framework of legislative acts, policies and regulations (SA DoE, 1997; SA DoE, 2001; SA DoE, 2008).

The transformation process at SA HEIs is complex, varying across different contexts, and often distinct from one institution to another (Grange, Du Preez, Ramrathan & Blignaut, 2020:44). However, what is clear is that structural changes brought about by transformation policies resulting from the merger of technikons and universities had a significant impact on SA HEIs. This led to an increase in bureaucracy, which adversely impacted HEIs and university staff (Dhanpat et al. 2019:1). This bureaucracy resulted in a myriad of problems, including a decline in staff morale, which in turn reduced overall performance, hampered research productivity, and increased workloads within the institutions (Dhanpat et al. 2019:9). Gie (2017:2) argues that the transformation of SA HEIs is intended to drive economic growth and social change. Thus, tying social responsiveness to economic demands as previously argued by other researchers (Singh, 2012:3). However, as all SA HEIs had to welcome numerous students of all races, transformation policies led to the massification of HE to align with the industry requirements of the 21st-century workplace (Bozalek, Ng'ambi & Gachago, 2013: 420). Nevertheless, the influx of students increased workloads for HEI staff, since institutions could not expand their workforce at the same pace. This resulted in existing staff taking additional responsibilities to meet the demands of a larger student population (Barkhuizen et al. 2014:322). The increased workload puts university staff under significant pressure and stress which is often associated with poor employee wellbeing experiences (Gie, 2017:255). Thus, increased academic workload due to transformation is a key factor contributing to mental health issues of university staff at SA HEIs.

2.4.3 Decolonisation initiatives

In the present discourse of the SA HE, decolonisation is a complex and much-discussed topic (Senekal & Lenz, 2020:157). In different contexts, it has different connotations. However, researchers largely concur that decolonisation focuses on resolving the lingering colonial

influences within the SA HE system (Dhanpat et al. 2019:1; Heleta, 2016:6). Heleta (2016:1) strongly argues that the epistemologies and knowledge systems in SA HEIs, have remained largely unchanged since the end of apartheid. These arguments imply that the SA HEIs curriculum remains Eurocentric, with Western epistemologies and knowledge systems. In view of this, Molefe (2016:32) advocates for the decolonisation of curricula within SA HEIs to end Western epistemologies. This necessitates a complete transformation of the whole epistemology framework that underpins the existing educational system (Letsekha, 2013:9). Ramoupi (2014:271) also strongly argues that the SA HE curriculum should reflect African realities and the social context for black SAs, rather than 'colonial' worldviews. Heleta (2016:7) supports the latter by stating that if no changes are made, the curriculum will continue to propagate the view that Africa has little to offer. Thus, the push for decolonisation in SA HEIs arises from the need to address historical inequalities and injustices.

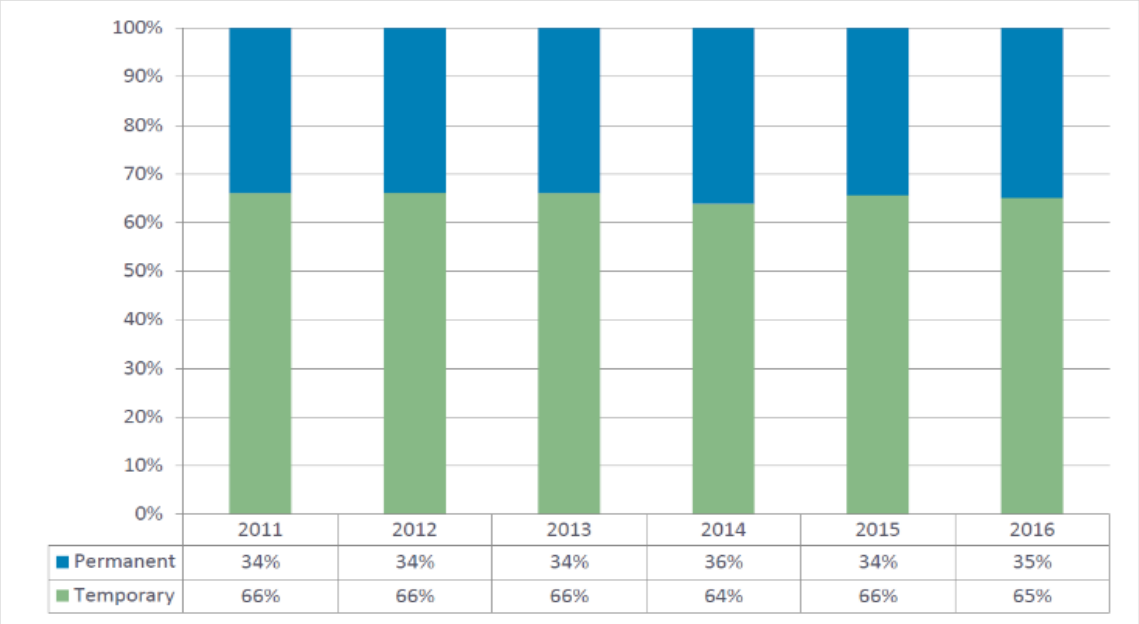
Despite policy changes adopted by professional bodies and frameworks, the transformation of the HE curriculum has been minimal (Ramrathan, 2016:2). Heleta (2016:7) contends that transformation, equality, and equity have not progressively evolved, despite these efforts. Furthermore, discussions regarding decolonisation of the curriculum are positioned in a HE system that is facing pressures from a variety of sources, including talent management challenges, lingering effects of the recent COVID-19 pandemic, a weak economic environment, political instability, an increasing focus on the Fourth Industrial Revolution (4IR), and the advancement of curriculum internationalisation (DHET, 2021:25; Musakuro & de Klerk, 2021:11). All of these issues have an impact on how SA HEIs are addressing curriculum decolonisation. COVID-19 has adversely impacted service delivery, including traditional teaching and learning methods. The poor economic environment is affecting government funding, while political instability is creating leadership challenges. The growing emphasis on the 4IR is influencing perceptions of technological advancement. The advancement of curriculum internationalisation is reverting HEIs to Western epistemologies. However, since 1994, and more recently during the decolonisation-related student demonstrations in 2015, it appears that ongoing decolonisation discussions in SA HEIs have had an impact on academic staff and their main responsibilities (Heleta, 2016:1). In this regard, Dhanpat et al. (2019:5) recommend that SA HEIs attract and retain leaders, academics, and administrators with expertise and passion for African content to decolonise the curriculum. Since student enrolments are increasing and the curriculum is changing continuously, scholars such as Pillay (2020:14785) assert that academic staff need to re-evaluate existing teaching and learning strategies and apply new novel methods of teaching

larger classes to sustain high-quality HE. Therefore, SA HEIs must invest in the necessary resources and support to ensure that academic staff can meet the changing demands of their teaching environment.

2.4.4 Poor talent management practices

Talent management is a crucial and pressing strategic issue confronting SA HEIs (Musakuro & de Klerk, 2021:1). A recent DHET Annual Performance Plan 2021/22 (2022:25) reported that SA HEIs are struggling to attract and retain competent staff. This is particularly concerning as a lack of competency in the HEI sector could have a detrimental effect on the quality of HE in SA. Thus, considering talent management as a factor contributing to mental health issues among university staff is imperative for understanding the broader context of HE problems. Musakuro and de Klerk (2021:3) assert that talent management is critical to achieving organisational success, ensuring that the right people are in the right roles and are equipped to perform to the best of their abilities at the right time. Painter-Morland, Kirk, Deslandes and Tansley (2019: 137) postulate that "employee satisfaction and morale can be influenced by talent management practices which directly affects their mental health", suggesting that prioritising talent management is key to creating a positive work environment and fully utilising skills and abilities of the university staff.

Talent management issues linked to job security are a major issue in SA HEIs, with an increasing number of academic staff working on fixed-term contracts (Kerr, 2021:27). This means that fixed-term contract employees do not have guaranteed work beyond the end of their contracts, leading to a more uncertain and insecure working environment that negatively affect mental health, productivity, and job dissatisfaction (Hill, MacNamara, Collins & Rodgers, 2016:9). According to the Council for HE (CHE) (2018:41), as illustrated in Figure 2.1 below, 65% of academic employees in SA public HEIs are temporary employees. Recent research attributed this to poor talent management practices at SA HEIs (Musakuro & de Klerk, 2021:12).



	2011	2012	2013	2014	2015	2016
Permanent	34%	34%	34%	36%	34%	35%
Temporary	66%	66%	66%	64%	66%	65%

Figure 2.2: Proportion of permanent vs. temporary academic staff members from 2011 to 2016

Source: CHE (2018:41)

More than a decade ago, it was reported that the majority of academic staff was approaching retirement age, creating a need to recruit new talent to SA's HEIs (Badat, 2010:24). However, as shown in Figure 2.2, the employment of temporary employees in SA HEIs has remained relatively constant since 2011, indicating poor talent management practices. This suggests that SA HEIs are not aggressively recruiting permanent employees, as they rely more on temporary staff to fill positions. Among other implications, the continuous employment of temporary employees implies that these individuals are unable to benefit from long-term job security, career growth, and other benefits such as salaries, and opportunities that are typically offered to permanent staff members (Strydom, 2011:71-73). Moreover, the lack of job stability and benefits can create a challenging work environment. Temporary employees may feel undervalued and uncertain about their future, which can adversely affect their mental health. A study by Strydom (2011:74) revealed that the continued employment of temporary employees resulted in employees experiencing feelings of insecurity, low self-worth, and hopelessness, leading to an overall decline in their mental health.

Research shows that in the past, academic careers were often viewed and admired for various reasons including low stress, job stability, flexible working hours, light workloads, overseas visits to academic conferences, and autonomous work (Poalses & Bezuidenhout, 2018:170). However,

nowadays the difficulty of securing research funding, publishing in high-impact and peer-reviewed journals, and the highly competitive environment of academia is overshadowing these benefits (Du Plessis, 2020:10). Moreover, the evolving landscape of academia in recent times has made these benefits less certain and more difficult to obtain, given the increasing workloads and reduced job resources (Barkhuizen, Roodt & Schutte, 2014:2034). For these reasons, researchers such as Barkhuizen and Rothmann (2008:321) regard HEIs as “stress factories” with unattractive working environments for novice scholars. Further to that, the modern academic profession is now widely recognised as a much more demanding profession, requiring hard work, long hours and high levels of commitment (Barkhuizen et al. 2014:2034). These changes mean that the rewards of an academic career may no longer be guaranteed, and those who choose to enter the field must be prepared for a much greater level of dedication and effort if they are to succeed.

2.4.5 Increased globalisation and internationalisation

The concept of globalisation is generally complex due to the multiple meanings that emerge from its many facets and diverse impacts worldwide. Despite the absence of a universal definition, it is often acknowledged that the concept entails the connectivity and interconnection of organisations and people throughout the world that subsequently contributes to global cultural, political, and economic integration (Shahidi & Seyedi, 2012:1300). The processes that drive globalisation have been ongoing for several years, but recent technological advancements accelerated and intensified them (Dzvimbo & Moloi, 2013:8). Technology advancements such as the internet, mobile devices, and transportation systems have enabled companies to access broader markets and customers, promoting competition and encouraging companies to maximise lower costs and new opportunities (Shahidi & Seyedi, 2012:1300). Globalisation has significantly impacted how people interact, work, and live as economies and cultures have become increasingly interconnected. To this end, globalisation remains one of the most significant issues to which HEIs must adapt to remain relevant, competitive, and sustainable (Popescu, 2015:417). However, other researchers such as Tankou Epse Nukunah, Bezuidenhout and Furtak (2019:285) posit that HEIs are well positioned to establish and sustain a successful globalisation process. Mtshweni (2022:243) concurs, adding that HEIs have a crucial role in influencing global issues such as globalisation. Thus, HEIs should act as drivers of change. In this context, Mense, Lemoine, Garretson and Richardson (2018:47) postulate that globalisation is the driving force behind the changes in HEIs, such as technological adoption, economic policies, knowledge expansions, and global integration of value systems and ideologies.

Owing to the recent developments in the global economy that have had a significant influence on HEIs, the strategic response to globalisation has come to be recognised as internationalisation. Dzvimbo and Moloi (2013:4) state that the internationalisation of HE involves a structured process of integrating global elements into HE to enhance educational goals, functions, and delivery, thereby promoting the quality of research and education. Moreover, the process of internationalising HE is regarded as a complex phenomenon in which multiple programmes and policies are established by both the universities and government at bilateral, regional, and global scales (Verger & Hermo, 2010:105; Dzvimbo & Moloi 2013:4). In light of this, authors such as Dzvimbo and Moloi (2013:4) emphasise that internationalisation is a philosophical stance with political and social aims that does not always consider economic issues. Rensburg, Motala and David (2015:92) further make a statement that in today's knowledge-based society, the premise for internationalisation is enhanced by cultural and social connectedness, enhanced economic development and competitiveness, shared knowledge building, and the pursuit of a more inclusive and compassionate prosperous society. This indicates that the concept of internationalisation is inextricably linked to geopolitical influences that impact the nature of academia, knowledge generation, and sharing.

A historical review of the internationalisation efforts in SA HEIs reveals that the concept is not new to the country. Sehoole (2006:5) asserts that the SA HE has origins in colonisation, shaped by Dutch and English influences, and is frequently argued to have been modelled after European institutions. However, the current discourse on internationalisation is mostly tied to the current understanding and interpretation of what globalisation entails. In HEIs, the growing emphasis on globalisation increasingly prioritises student and staff mobility as well as international research collaborations, with significant implications for the sector. Hénard, Diamond, and Roseveare (2012) affirm that globalisation enables the movement of students, university staff, information, and knowledge both physically and digitally. It also enables virtual access and the exchange of policies and practices. This, in turn, brings together students and university staff from different HE systems, resulting in a mixed and diversified learning environment. However, previous reports revealed that some HEIs often expect international students to adjust to their HE contexts (Hénard et al. 2012:25). This causes mismatches and misconceptions, which result in a fundamental rift between students and university staff (Ryan & Carroll, 2005:5).

The growth of HEIs has been attributed to globalisation and internationalisation, but these two elements have also been regarded as influential factors driving change within HEIs (Rensburg et al. 2015:92). Al Serhan and Houjeir (2020:1370) contend that globalisation and

internationalisation have created new opportunities for HEIs, such as the ability to attract diverse sources of funding and attract international staff from around the world, and extending their reach beyond national borders and collaborating with other HEIs worldwide. Thus, furthering the development of HEIs. Al Serhan and Houjeir (2020:1370) also postulate that globalisation and internationalisation have intensified competition among universities in areas such as research, teaching, student and staff exchange, and technology transfer.

Globalisation and internationalisation are not without challenges in HEIs. Globalisation and internationalisation have significantly contributed to mental health issues amongst university staff in SA HEIs (Fynn & van der Walt, 2023:8). This is largely attributed to increased workload, growing performance expectations, and job insecurity due to the introduction of cutting-edge technologies, which are among the main causes of rising stress levels in HEIs (Fynn & van der Walt, 2023:8). Furthermore, the presence of a large number of foreign nationals in HEIs, who may be subjected to different norms and expectations is contributing to feelings of isolation and cultural incompatibility (Sabzalieva, 2020:6). Evidence suggests that the pressures of meeting globalisation demands significantly contribute to stress, burnout, and depression among university staff (Kelly, 2003: 469).

Jasson (2020:9) asserts that university staff are subjected to a variety of work-related pressures because of the numerous obligations and responsibilities they must fulfil. Their roles and responsibilities demand a broad spectrum of skills to successfully achieve the desired outcomes in the HE work environment. To this end, several researchers posit that these changes in SA HEIs are mainly influenced by globalisation, increasing internationalisation, and innovations in ICT, and other social and economic transformations in SA HEIs (Barkhuizen et al. 2014:322; Rensburg et al. 2015:92; Kritz, 2006:5). Moreover, these factors pose numerous challenges for university staff, who not only face an increasing number of roles and responsibilities but are also confronted with limited resources. They are required to develop and implement effective teaching strategies in the aftermath of COVID-19, adapt to evolving technologies such as learning management systems and other non-teaching platforms and deliver quality education to a growing student population all with budgetary constraints.

Consequently, the evolving HE environment has necessitated increased adaptability and flexibility among university staff including developing advanced skills to meet new demands. However, frequent power outages, the growing reliance on hybrid learning models, and ongoing student protests often challenge university staff to manage their time efficiently to meet these demands in

SA HEIs. When time management is ineffective, it can lead to feelings of overwhelm and stress, exacerbating mental health issues. This is often compounded by a lack of support from university management, long working hours, heavy workloads, and limited resources leading to burnout (Knight, Carlisle, O'Connor, Briggs, Fothergill, Al-Oraibi, Yildirim, Morling, Corner, Ball & Denning, 2021:9). As a result, staff members may feel underappreciated and unable to cope with the high demands of their roles.

2.4.6 Impact of COVID-19

According to WHO (2022:n.p), COVID-19 is "an infectious disease caused by the SARS-CoV-2 virus". Alimohamadi, Sepandi, Taghdir and Hosamirudsari (2020:307) postulate that the common symptoms of COVID-19 include "fever, dry cough, and tiredness and other less common symptoms include aches and pains, nasal congestion, headaches, conjunctivitis, sore throat, diarrhoea, loss of taste or smell and a rash on the skin or colouring of the fingers or toes". COVID-19 was initially discovered in the Chinese city of Wuhan at the end of December 2019, and the virus rapidly spread throughout the city and to other countries, impacting the lives of many people in various ways (Magamela, Dzinamarira & Hlongwa, 2021:1). Following a thorough assessment of the outbreak, the WHO (2020:n.p) declared COVID-19 a pandemic on 11 March 2020, with 118 000 confirmed cases in 114 countries and 4 291 deaths. In SA, President Cyril Ramaphosa addressed the nation on 15 March 2020 announcing a National State of Disaster and declaring a total lockdown for all SAs, except essential service providers starting at midnight on Thursday, 26 March 2020. Due to the increase in the COVID-19 cases and deaths in SA, the government further adopted containment and mitigation measures to prevent the spreading of the virus (Khoza, Khoza, & Mukonza, 2021:108). One of the measures encompassed lockdown, and as a public health measure, 'lockdown' refers to a restrictive series of non-pharmaceutical interventions designed to limit the movement of people (Misra, Joshi, Sarwal & Rao, 2022:2). During the pandemic, the lockdown was used as a measure to prevent the spread of COVID-19 by restricting people's movements. Other measures introduced in SA include isolation protocols, the wearing of face masks, regular handwashing of hands, and the use of sanitisers, quarantines, social distancing, and prohibition of mass gatherings (Khoza et al. 2021:108; Magamela et al. 2021:1). Although these measures were essential to curb COVID-19, they directly threatened the completion of the 2020 academic year for SA HEIs (Van Niekerk & Van Gent, 2021:1). Due to the severity of the pandemic, SA HEIs had to shift to emergency remote learning (Du Plessis et al. 2022:2). This was the reality at the time when it became evident that SA HEIs would be closed

for a prolonged length of time following the “president’s proclamation of a national state of emergency and a lockdown model consisting of multiple risk levels” (Makokoane, 2021:58).

The COVID-19 pandemic exposed the vulnerability and fragility of SA’s HE sector. For instance, historically black institutions in SA struggled with migration to online teaching and learning (Mtshweni, 2022:237). Sonn, Du Plessis, Jansen Van Vuuren, Marais, Wagener and Roman (2021:8) concur, noting that although well-resourced HEIs were prepared for online teaching and learning before the lockdown began, historically black institutions lacked the same competitive edge and were disadvantaged due to the limited mobile data and laptops for both staff and students. Furthermore, the lack of critical ICT tools, and infrastructure and limited technical knowledge of online pedagogies added to the challenges of transitioning to online teaching and learning (Wangenge-Ouma & Kupe 2020:10). This highlights that prior to the pandemic, some SA HEIs lacked capabilities for emergency remote learning, and suitable models for online teaching and learning. The COVID-19 pandemic exacerbated existing inequalities, further hindering the ability of under-resourced institutions to deliver academic scholarship, and compromising their role in serving the public good (Wangenge-Ouma & Kupe 2020:11). Moreover, the pandemic exposed inequities at SA HEIs given the challenges experienced related to online teaching and learning, signifying that some SA HEIs may be unprepared and potentially left behind in the 4IR (Du Plessis et al. 2022:2). However, Du Plessis et al. (2022:2) also point out that most SA HEIs have business continuity strategies in place because of lessons gained during the 2015/2016 #FeesMustFall movement. Despite these strategies, at the time of conducting this study, many SA HEIs were still struggling to adapt to the pandemic and its effects on the way teaching and learning. This means that the risk of some institutions being left behind was very real and could have a detrimental impact on students and staff.

COVID-19 transformed SA HEIs through the widespread adoption of online teaching and learning. Hybrid and blended learning models transformed the role of academics, making them more involved and engaged in the evolving teaching methods. A hybrid or blended learning model entails any combination of in-person and remote learning, requiring additional resources and activities (Prasetya, Wibawa, Hirashima & Hayashi, 2020:277). Nowadays it seems SA HEIs are embracing hybrid and blended educational strategies that are associated with SA realities despite the challenges mentioned earlier. Moreover, this is becoming more feasible as COVID-19 regulations have been steadily eased. In addition, current and ongoing power outages in SA are also contributing to the use of hybrid learning in HEIs, which leads to increased challenges for university staff and students alike. Electricity challenges continue to impact HEIs in SA, causing

a detrimental effect on teaching and learning as well as the mental health of university staff. Increased load shedding means that students and staff are unable to rely on electricity. This can cause disruptions in classes including delays in assignment submissions and examination seating. Consequently, it can cause stress and anxiety among staff and students potentially impacting the educational experience in the long term.

Between 2020 and 2022, the pandemic created uncertainty about the future modes of delivery for HE in SA. Without a clear DHET position on future modes of delivery of HE, and the COVID-19 pandemic, researchers such as Khoza et al. (2021:117) encouraged university staff and students alike to utilise online learning to develop their digital abilities in line with evolving educational trends. Wangenge-Ouma and Kupe (2020:11) endorsed the latter by suggesting a hybrid or blended teaching and learning approach in which HEIs develop strategies around their current institutional capabilities. The scholars further explain that all SA HEIs should consider implementing and scaling up blended learning since it has the potential to enhance quality, extend access, and bring other cost-saving benefits. However, as previously discussed, inequalities continue to dominate SA history, raising practical concerns about the future usage of hybrid, blended, and online learning models. Thus, this study contends that even if hybrid, blended, and online learning models are indefinitely implemented in the near future, student's access to online learning platforms would be hampered due to the challenges previously mentioned. Besides historical disparities, the digital divide is a major barrier to online teaching and learning in SA, with uneven access to computers and the internet impacting the feasibility and sustainability of these methods (Mpungose, 2020:2).

Prior to COVID-19, research by Allen and Seaman (2013:6) found that academics were resistant to online teaching and learning because they believed educational principles were being threatened. Literature shows that senior academics, in particular, prefer the traditional contact mode of teaching (Goolnik, 2012:10). In light of the increasing acceptance of new methods of teaching and learning in SA HEIs, Dhanpat et al. (2019:5) argue that academics perceive themselves as challenged and lack critical skills necessary to effectively utilise digitally based teaching and learning systems, which may lead to mental health problems for academic staff. However, Mhlanga, Denhere and Moloi (2022:4) posit that during COVID-19, academics were compelled to embrace novel teaching pedagogies to allow the continuation of academic programmes. Unfortunately, the pandemic also led to a sharp rise in teaching workload, a lack of ICT skills, various pedagogical issues related to online learning (Du Plessis et al. 2022:10; Wangenge-Ouma & Kupe 2020:10). These challenges were exacerbated since academics had

scanty or no experience with online teaching and learning (Hedding, Greve, Breetzke, Nel & Van Vuuren, 2020:1). The causes of this phenomena include a lack of adequate training in effective online teaching and learning prior to the rapid transition among university staff (Mhlanga et al. 2022:4). Thus, academic staff had to quickly upskill themselves and become familiar with “online teaching and learning systems” in addition to their existing administrative duties.

As mentioned above, SA adopted numerous containment and mitigation measures to prevent the spread of the virus and restrict population movement, as was the case worldwide (Magamela et al. 2021:1; Sahu, 2020:1; Olawale, Mutongoza, Adu & Omodan, 2021:180). Whilst these measures were essential, their implementation had unintended implications for the mental health of university staff (Van Niekerk & Van Gent, 2021:2; Olawale et al. 2021:180). A survey conducted by Laher, Bain, Bemath, de Andrade and Hassem (2021:225), concluded that the hybrid learning approach led to the loss of social aspects of university life, creating anxieties and fears that impacted the mental health of university staff and students. The COVID-19 pandemic presented a risk to HEIs’ progress and completion of the 2020 academic calendar (Van Niekerk & Van Gent, 2021:2). To maintain and continue with academic operations, several HEIs were forced to transition from the traditional learning model (face to face) to a blended or hybrid learning model, for which relatively few institutions and university staff were prepared (Sahu, 2020:2). Hybrid learning models, however, presented various challenges to both university staff and students, for instance, lack of access, training and availability of learning resources (Dhawan, 2020:16; Olawale et al. 2021:190). Other researchers reported that the hybrid learning approach impacted assessment and evaluation, particularly for students with limited access to the internet, which negatively impacted their grades or results (Sahu, 2020:2; Dhawan, 2020:16). During the pandemic, academic staff were required to provide additional support to students, despite struggling to cope with their own increased job demands due to sudden changes in the academic calendar and the associated lack of physical interaction (Van der Ross, Olckers & Schaap, 2022:2). Furthermore, university staff were forced to take on additional responsibilities at home, such as home-schooling their children, while grappling with the difficulties and anxieties caused by the pandemic. Barkhuizen et al. (2014:322) assert that increased job demands on university staff may result in burnout and poor commitment levels. This can lead to decreased job satisfaction and heightened levels of stress, which can have a detrimental impact on the university staff's overall performance.

COVID-19, and the absence of farewell rituals for the loved ones, had a significant impact on the mental health of those affected. As of 8 August 2022, there were 4 004 555 confirmed cases of

COVID-19 in SA, with 101,982 deaths (WHO, 2022:n.p). Many people were buried without traditional funeral rituals, resulting in complicated grief and depression. As noted by Chen (2022:13), the inability to engage in in-person contact and communication with the deceased before or during their death, due to pandemic-related restrictions, exacerbated the distress and complicated grief of individuals. This highlights the difficulty of dealing with grief during the pandemic, as individuals had to bid farewell without the usual physical and emotional support of family and friends.

2.5 The concept of mental health

The previous section laid the foundation for understanding the current landscape of SA HEIs. It explained the nature and purpose of HEIs, provided a historical overview of SA public HEIs including the selected SA public HEI case study and the roles and responsibilities of university staff. It also explored the factors contributing to mental health issues among university staff. Building on the understanding of SA HEIs, this section explores the concept of mental health in SA HEIs. It helps to form a comprehensive picture of mental health issues in SA HEIs.

2.5.1 Defining mental health

To contextualise the concept of mental health, it is important to restate the definition of mental health even though this was done in the preceding chapter. This chapter seeks to further understand the concept and highlight key factors contributing to the mental health issues in the HE work environment. According to WHO (2001:1), mental health refers to “a state of good health in which each individual understands his or her own capacity, can manage life’s regular pressures, can perform effectively and meaningfully, and can participate in society”. This definition includes three basic aspects: well-being, effective functioning in an individual’s life, and in a community, all of which contribute to mental health (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011:99). These aspects are interconnected and influences each other. For example, if an individual can manage life’s pressures, they are more likely to effectively function in their life. This in turn leads to increased productivity in the workplace or successful functioning in the community. In further defining and understanding these three basic aspects, Westerhof and Keyes (2010:111) state that mental health is also associated with emotional, psychological, and social well-being. The positive dimensions of mental health are outlined in the WHO’s definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2013: 1). From this definition, it is noted that health is imperfect without mental

health. Health cannot and therefore should not be considered as simply the apparent lack of disease or illness, but instead as a condition of positive physical, mental, and social well-being (Sartorius, 2006:662). However, Connellan (2021) suggests that mental health is a spectrum, with individuals on one end demonstrating resilience and coping well with life's challenges, while others struggle with mental health disorders that affect their daily functioning, as illustrated in Figure 2.3 below. Connellan (2021:148) also explains that it is possible and even normal for individuals to fall somewhere in the middle, and if one falls in the centre of the spectrum, he or she is likely to describe their mental health as "fine". This means that while some individuals may be resilient to the stresses of daily life and can cope with life's uncertainties, others may be more vulnerable and experience mental health issues that interfere with their daily functioning. There is no universal standard for resilience and mental health, and people's experiences can differ significantly.

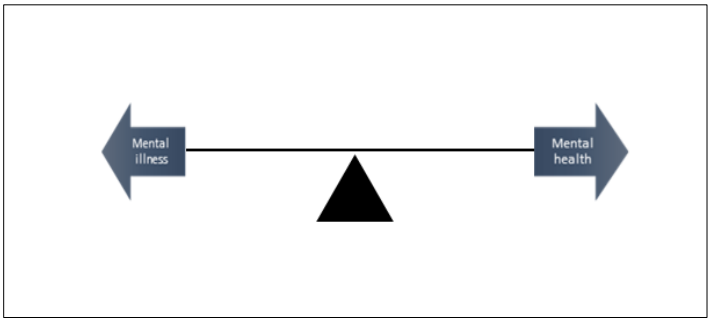


Figure 2.3: Mental health continuum

Source: Connellan (2021:148)

2.5.2 Benefits of mental health

The significance of mental health is that it relates to the essence of who individuals are, the way they get involved, connect, learn, work, and how they feel happiness and experience suffering (United Nations, 2020: 5). In view of this, it seems mental health is more significant than ever, and its essential value is that it impacts every aspect of human life. Thus, mental health can be seen as the foundation of an individual's well-being, providing them with the necessary means to be resilient in the face of adversity. Moreover, mental health has an impact on people's abilities to deal with stress. O'Hagan and Quinn (2018:7) argue that mental health helps employees such as university staff to sustain healthy relationships, make informed decisions, manage physical health and well-being, and help them to self-actualise. This suggests that it is imperative for SA

HEIs to provide support for their employees' mental health to ensure an efficient, productive and healthy work environment. In addition, Mulutsi (2017:1) asserts that mental health encourages good behavioural choices and lowers the need for medical interventions. Therefore, focusing on mental health is not only beneficial for an individual's well-being, but it can reduce the financial strain that medical interventions can bring while encouraging good health.

It has also been observed that mental health has a reciprocal link with well-being and productivity in workplaces such as HEIs (WHO, 2013:21). This suggests that good mental health can lead to increased productivity, job satisfaction, and employee engagement. Therefore, in SA HEIs, increased good mental health can lead to increased productivity, such as more research outputs, which can benefit HEIs as a whole. The UN (2020: 5) stresses that prioritising mental health is essential for countries to successfully navigate and recover from the COVID-19 pandemic. This suggests that investing in mental health is essential for SA HEIs to thrive and recover from the post-pandemic.

Depression, anxiety, PTSD and workplace bullying can have harmful effects on individuals, societies, and workplaces including HEIs (Guthrie et al. 2017:30; Muazzam, Anjum & Visvizi, 2020:9; Mensah, 2018:2671). This can result in reduced productivity, strained healthcare systems, and an overall increase in social tensions and instability. Research also shows that people with mental health issues often find it difficult to perform everyday tasks such as self-care, exercising and healthy eating (Sharma, Madaan & Petty, 2006:106). There is also evidence that individuals with poor mental health are more likely to experience physical health issues, including high blood pressure, heart disease, and diabetes (Mushtaq, Shoib, Shah & Mushtaq, 2014:3). Mushtaq et al. (2014:3) report that sleep problems often accompany poor mental health, which can further exacerbate physical and mental health issues. Based on this, it is evident that poor mental health can have severe adverse consequences. These issues should be prioritised by SA HEIs, who should address them appropriately to reduce the associated risks.

Good mental health may further assist university staff to cope with life's stressors, enabling them to have healthy relationships and make meaningful contributions to SA HEIs and society at large. Mental health is essential for university staff to realize their full potential and perform their duties effectively. This will in due course benefit both their institutions and the community as a whole. To summarise, mental health is imperative for the well-being of university staff and their ability to function efficiently in the HE workplace. This is due to the fact that they are responsible for producing graduates and generating new knowledge through research and innovation. This

suggests, that when university staff have good mental health, they will be more efficient, have better relationships with their colleagues, manage their workloads, and are better equipped to support and inspire their students. Having healthy staff in HEIs helps create an overall improved learning environment for students. Hence, providing adequate support for staff's mental health should be a priority for SA HEIs.

2.6 Common mental health disorders

It should be highlighted at the outset that each mental health disorder has its own set of unique symptoms, although there are fundamental indications of mental disorders (Meyer, Matlala & Chigome, 2019:26). Therefore, it is vital to note that these symptoms might differ from person to person, necessitating effective management strategies for mental disorders. While there are several types of mental health disorders, the study considers depression, anxiety, trauma, PTSD and bipolar disorder. In addition, the study also discusses occupational stress and burnout, as they are often linked to workplace mental health issues in SA HEIs. However, it is imperative to note that occupational stress and burnout are not entirely considered mental health disorders (WHO, 2019, n.p). Nevertheless, it is important to acknowledge that these factors can contribute to mental health disorders and should be recognised when comprehending the mental health of university staff. This will lead to a deeper insight into mental health issues within SA HEIs.

2.6.1 Depression

Depression is a major and common mental health illness worldwide. It has been defined as a common mental health disorder, characterised by sadness, loss of interest or pleasure, feelings of guilt or self-worth, disturbed sleep or appetite, feelings of tiredness and poor concentration WHO (2017:5). Gilbert (2007:5) provides a more accurate description of depression, explaining that it impacts individuals differently and manifests across various aspects of functioning, including the following:

- **Motivation** – Depressed individuals often exhibit apathy, low energy, loss of interest in things that once seemed meaningful, and have a pessimistic outlook on the future.
- **Emotion** – Depression reduces pleasant feelings in moderate to severe cases because the person has trouble finding pleasure.
- **Cognitive** – Individuals with depression may experience cognitive difficulties, including problems with attention, concentration, and memory. These issues can sometimes lead others to mistakenly believe they have dementia.

- **Behavioural** – Depressed individuals often withdraw from previously enjoyable activities, including socialising with family and friends, and tend to avoid seeking help from others.
- **Biological** – Sleep problems are common among depressed people, suggesting that they sleep lightly and wake up too soon. Also, depressed people tend to lose interest and appetite in sex.

Whilst there is still more research to be undertaken to better understand depression, the available evidence indicates that it is caused by a complex interplay of hereditary factors, changes in neurotransmitters and dopamine, altered endocrine function, and psychosocial factors (Meyer et al. 2019:26). This suggests that depression's fundamental causes are obscure. Guthrie, Lichten, Van Belle, Ball, Knack and Hofman (2017:30) assert that severe depression can contribute to suicide in HEIs, which is mainly attributed to the "culture of perfection" among university staff. The pressure to achieve perfection in a competitive academic environment can be overwhelming. This can contribute to feelings of worthlessness, shame and hopelessness, which can escalate to severe depression (Guthrie et al. 2017:30). Thus, depression can lead to suicidal thoughts and actions. Such an impact was evident in the suicide of an academic and Dean of a leading SA university (Mensah, 2018:2671). The Dean was 51 years old at the time and was a professor when he died after suffering from depression for almost two years (Mensah, 2018:2671). After his suicide, a report was released indicating that there was no record of a formal university programme to deal with university staff's psychological trauma at that time (Nhlapo, Somadoda, Gobodo-Madikizela & Walaza, 2020:109). Additionally, there was no record showing that the former Dean received mental health treatment or support prior to his death (Nhlapo et al. 2020:109). The report clearly shows a failure to provide adequate support for the Dean during his time of need, highlighting the importance of establishing mental health programmes in SA HEIs.

As highlighted above, depression may be dangerous to health, especially if it occurs frequently and with moderate or severe intensity. Approximately 300 million people worldwide are often diagnosed with depression, and it was previously stated that depression was then the second most common illness in 2020 (WHO, 2017:5). A study conducted by Stander, Korb, de Necker, de Beer, Miller-Janson and Moont (2016:4) found that at least one in four employees in the SA workplace have been diagnosed with depression. Another study found that half of those diagnosed have taken time off work at some point due to their condition. On average, employees with depression took 18 days off work in SA in 2016 (SADAG, 2016 n.p). This suggests that depression is a serious issue that affects the productivity and attendance of employees in SA workplaces, with tangible economic implications for businesses.

In accordance with the viewpoints of Du Plessis (2017: 221), mental health problems such as depression usually lead to undesirable, expensive and often devastating consequences for both the individual and the organisation. For instance, depression can make the affected individual underperform at work. Stander et al (2016:6) report that employees who worked when depressed and with reduced cognitive function had adverse working behaviours. The tasks varied in difficulty, and sad employees linked their poor performance to concentration issues, forgetfulness, and indecision. Furthermore, the sad employees had considerably impaired relationships with their colleagues to the extent that they ended up withdrawing and complaining, highlighting the profound emotional impact of depression on functionality. These research findings are aligned with the definition and symptoms of depression explained earlier (WHO, 2017:5; Gilbert, 2007:5). Therefore, the repercussions of a depressed state of mind can be severe and far-reaching, affecting individuals in different ways including their social interactions.

2.6.2 PTSD

Some of the concerns related to mental health in the HE work environment include trauma and PTSD. These two types of mental health are explored separately first, then combined to have a comprehensive understanding of their impact on the HE work environment. Trauma is “an emotional reaction to a horrific experience such as rape, war, car accident, or natural disaster” (Ratangee, 2021:47). One can therefore conclude that trauma is about events and their impact on mental health. Traumatic events can have long-term psychological effects, such as PTSD. These effects can make it difficult for university staff to concentrate on their work, leading to lower performance in HE. By understanding the individual and combined impact of trauma and mental health issues, universities and other employers can develop better strategies to support individuals. This will create healthier work environments.

Van der Kolk (2000:8) states that numbness, withdrawal, confusion, shock, and speechless terror are some of the common reactions to a traumatic event or experience. Even though these feelings are normal, studies show that some individuals find it difficult to recover from a traumatic experience (Van der Kolk, 2000:8). This suggests that people who experience traumatising incidents may have difficulties adapting and coping in the short term, but they generally recover over time. However, if an individual’s trauma symptoms worsen and linger for months or years after the event, interfering with daily functioning, they may be suffering from PTSD. PTSD is thus a mental health illness induced by a lengthy distressing experience. Common symptoms of PTSD include abnormal emotions, flashbacks, strained interpersonal relationships, and even physical

problems such as headaches (Rowell & Thomley, 2013:n.p). This also suggests that a victim of a traumatic experience is more prone to dissociation if the distressing event lasts longer. Moreover, PTSD symptoms present significant challenges in social or occupational settings and they can impair one's ability to perform everyday activities.

COVID-19 is widely considered a traumatic event (Forte, Favieri, Tambelli & Casagrande 2020:2). This means that people who have experienced or are still experiencing trauma due to the pandemic may be more vulnerable to developing PTSD and its associated symptoms. This could lead to further impairments in their ability to perform day-to-day activities. Therefore, it is essential for individuals exposed to the trauma of COVID-19 to receive the necessary support and resources to prevent the development of PTSD and its associated symptoms, which could otherwise lead to further impairments in their daily functioning.

Wangenge-Ouma and Kupe (2022:18) state that the COVID-19 pandemic began as a public health issue but escalated into a global social, economic, political, and technological crisis. This suggests that the implications of the pandemic have been far-reaching and exposed structural vulnerabilities throughout the world. Wangenge-Ouma and Kupe (2022:18) further view the recent pandemic as a "wicked" challenge that brought instability, turmoil, and difficulty to many people and society. The researchers also note that HEIs have long operated in unpredictable, demanding, and competitive environments, with COVID-19 being the most recent disruptive challenge they faced. Thus, HEIs need to prepare for future disruptive events by designing resilient systems and implementing strategies that can be quickly adapted to changing conditions.

2.6.3 Generalised anxiety disorder

While other anxiety disorders exist, this study focuses on generalised anxiety disorder, the most common type, characterised by persistent worry, feeling overwhelmed, and difficulty in sleeping (Meyer et al. 2019:26). In addition, generalised anxiety disorder is characterised by a forward-looking mood state in which a negative event is anticipated (Craske, Rauch, Ursano, Prenoveau, Pine & Zinbarg, 2011:370). Meyer et al. (2019:26) further assert that generalised anxiety disorder is sometimes connected with PTSD, higher rates of drug addiction, and obsessive-compulsive disorder. Thus, it is clear that generalised anxiety disorder is a complex disorder with a range of possible consequences.

COVID-19 was identified earlier in this study as a factor contributing to mental health issues in HEIs. Sahu (2020:3) postulated that the rapid increase in COVID-19 cases, including deaths,

created anxiety, fear, and uncertainty among the university fraternity. In light of the increased awareness of COVID-19 risks, previous research has demonstrated that employees' concerns and fears of infection, and uncertainty about their future health and safety are important issues (Hall et al. 2008: 446–452). These feelings of helplessness and lack of control are likely to increase as employees become increasingly concerned about their health and safety. Moreover, the fact that the post-COVID-19 work environment was expected to change, for many employees adapting to the changing work environment also contributed to additional stress and anxiety (Inchausti et al. 2020:6).

The COVID-19 vaccination process was another aspect that contributed to the challenges university staff faced in adapting to the post-pandemic work contributing to increased anxiety. Vaccines are among the most effective preventative measures, and their effectiveness depends on widespread acceptance (Omer, Salmon, Orenstein, Dehart & Halsey, 2009:1981). COVID-19 vaccinations are particularly crucial for safeguarding personal health, protecting the most vulnerable groups, and facilitating the reopening of social and economic activities amid the ongoing pandemic (Cooper, van Rooyen & Wiysonge, 2021:922). However, the re-opening of HEIs caused heightened emotions, anxiety and uncertainty among university staff in SA. Recent surveys have reported that vaccine hesitancy is an emerging problem not only in SA but globally (Murphy, Vallières, Bentall, Shevlin, McBride, Hartman, McKay, Bennett, Mason, Gibson-Miller & Levita, 2021:5; Cooper et al. 2021:922). Fear of the unknown, concerns about contracting the virus, and worries about being unable to protect oneself or loved ones are among the main reasons for vaccine refusal (Murphy et al. 2021:6). Furthermore, the lack of clear guidance from the government and a general mistrust of the vaccine contributes to the overall uncertainty and anxiety surrounding vaccination (Cooper et al. 2021:922).

As evidence of vaccine refusal increased, some SA HEIs began to adopt mandatory COVID-19 vaccination policies for university staff and students (Phakathi, 2021:n.p). Although mandatory vaccinations can be ethically justified (WHO, 2022:1) the initial discussions were not well received in SA HEIs, and this caused a lot of anxiety among university staff and students. Despite these potential ethical justifications, the introduction of vaccine mandates in SA HEIs was met with resistance and apprehension from staff and students alike (George, Strauss, Lansdell, Nadesan-Reddy, Moroe, Reddy, Eshun-Wilsonova & Moshabela, 2022:11). Therefore, it is clear that vaccine mandates are a complex ethical issue that requires careful consideration before implementation.

2.6.4 Bipolar disorder

According to Grande, Berk, Birmaher and Vieta (2016:1561), bipolar disorder is a recurrent mental health disorder characterised by elevated fluctuations in mood state and energy including manic episodes of high energy and euphoria to depressive episodes of low energy and sadness. It can cause difficulties with concentration, motivation, and interpersonal relationships, all of which can impair a person's ability to perform effectively at work (Grande et al. 2016:1561). Meyer et al. (2019:26) concur, noting that people with bipolar disorder experience extreme and intense shifts in mood, energy, and activity levels. These shifts can disrupt the workplace, resulting in a decline in job performance, increased absenteeism, and even dismissal. In some cases, employees may choose to switch to less demanding jobs to better manage their stress and workload (Marwaha, Durrani, & Singh, 2013:189). Consequently, it is evident that bipolar disorder can have a profound negative effect on an individual's personal and professional life.

Evidence indicates that people with bipolar disorder find it difficult to complete basic tasks as they may experience extreme shifts in mood, energy and activity levels (Anderson, Haddad & Scott, 2012:345). Moreover, these shifts often impact job performance and, in some cases, lead to withdrawal from work and social activities. This can negatively impact relationships with co-workers and supervisors. Bipolar disorder, with its complex shifts in mood, energy, activity, and concentration, is a difficult mental health condition to manage in the workplace (Meyer et al. 2019:26). For example, a university staff member suffering from bipolar disorder may have difficulty maintaining a consistent work schedule due to fluctuations in energy levels and concentration. Thus, SA HEIs must provide adequate mental health support to help staff perform their duties effectively.

2.6.5 Burnout

The WHO (2019, n.p) included burnout in the 11th Revision of the International Classification of Diseases (ICD-11) as an occupational occurrence. However, it is not classified as a medical condition and is defined as a condition believed to be caused by unmanaged and prolonged work-related stress (WHO, 2019, n.p). Burnout is generally characterised by three dimensions. First, feelings of exhaustion or fatigue; second, growing mental detachment from one's job; and finally, feelings of negativity or cynicism toward one's career (WHO, 2019, n.p). Similarly, Du Plessis (2017: 225) defines burnout as a total depletion of physical and mental resources caused by striving to reach an unrealistic work-related goal. Employees who are over-dedicated to achieving

their goals are typically identified as workaholics and are prone to burnout. These employees often neglect family and social engagements leading to an unbalanced lifestyle. Meyer and Kruger-Pretorius (2018:217) state that burnout employees are usually exhausted, inefficient, and unproductive. The subsequent incapacity at work can result in stress, increased alcohol consumption, and conflicts with colleagues.

Smith, Segal, and Robinson (2021: n.p.) present a new perspective on the causes of burnout. The authors assert that burnout is caused by personality traits, the workplace and the employee's lifestyle and life expectations. Firstly, personality traits such as perfectionism, pessimism, reluctance to delegate tasks, and high-achieving personalities such as those seen in Type A personalities, can contribute to burnout. Secondly, workplace or job-related factors contributing to burnout include unrealistic job expectations and monotonous, repetitive and unchallenging tasks. Job-related causes of burnout include high-pressure work environments, dysfunctional workplace dynamics and a lack of rewards and recognition. Lastly, employees' own lifestyles and life expectations also contribute to burnout. Smith et al. (2016: n.p) A work-life imbalance, taking on too many roles and responsibilities both inside and outside the workplace, insufficient support, and a lack of sleep or relaxation can all contribute to burnout. Kleovoulou (2021:87) maintains that since burnout was originally conceptualised in the early 1970s, a lot of academic research has focused on this issue, and it is clear that it is non-discriminatory and happens across cultures. Kleovoulou (2021:87) is of the view that burnout affects people of all genders and can occur in various occupations and fields. In HEIs, burnout is a common problem experienced by university staff (Guthrie et al. 2017:8). Using a large sample of N=1439, a research study conducted by Padilla and Thompson (2016:551) reported that time allocation and perceived pressure to complete tasks contributed to university staff burnout. Kinman (2014:220) concurs, adding that the problem is getting worse alongside the increasing job demands in the HE work environment. However, the increasing job demands are not surprising, given the significant increase in student numbers and the growing pressures for efficiency and accountability in HEIs (Kinman, 2014: 220). In SA, it has been reported that more students from diverse backgrounds are entering HE because of historical inequalities (Barkhuizen et al. 2014: 322). A substantial number of these students enrolling in university programmes have received a poor quality of education which contributes to the burden on academics in SA (Barkhuizen et al. 2014: 323). In addition to the increasing student numbers, university staff are also facing an increase in related to postgraduate supervision (Naidoo-Chetty & Du Plessis, 2021: 277; Barkhuizen et al. 2014:330). This has had a major impact on university staff workloads, making their roles increasingly complex.

2.6.6 Occupational stress

Occupational stress refers to the physiological and psychological state of disruption caused by the presence of an unanticipated, disruptive, or stimulating event (Harn, Payne & Lucas, 2009: 55). This definition denotes that unexpected changes related to factors or events in one's life either real or imagined create pressure, tension or worry. This in turn affects an individual's physiological and psychological state. Edlin and Golanty (2014:44) explain that stress is made up of four components namely, environmental (stressors), mental, emotional, and physiological. The authors further elucidate that there is a relationship between an individual and their environmental situations or life events. This relationship involves the mental, cognitive, emotional, and physical reactions to those occurrences. In essence, stress arises from thoughts that lead to either pleasant or unpleasant conditions. Therefore, how an individual responds to stress can significantly affect their physical and mental health.

A study by Barkhuizen and Rothmann (2008:321) confirmed that organisations like HEIs are sources of stress that affect the mental health of university staff. In addition, research has shown that university staff are exposed to various organisational stressors in HEIs. In Chapter One, it was argued that some of the stressors include rising student enrolments, reduced job autonomy, heightened pressure to improve national and international research publications, greater demands related to postgraduate supervision, inadequate leadership, and management, escalating administrative responsibilities, poor working relationships, and a lack of engagement in decision-making are particularly detrimental to one's well-being (Kinman & Johnson, 2019:159; Gie, Slabbert & Haydam, 2017:11; Barkhuizen, Rothmann & Van de Vijver, 2014:330; Bezuidenhout & Cilliers, 2010:1). Additionally, factors such as limited promotion opportunities, inadequate compensation, poor working conditions, job insecurity, unrealistic deadlines, and workplace bullying also contribute to the stressors in HEIs. (Badenhorst & Botha, 2022:11; Du Plessis, 2020:2). Consequently, HEIs must take proactive measures to address these factors to mitigate their effects on staff.

Occupational stress in HEIs leads to adverse effects, such as poor job satisfaction, decreased work performance, deteriorating health and mental health, strained interpersonal relationships, high absenteeism levels, and increased staff turnover (Luzipho et al. 2023: 6; Du Plessis, 2020:11). All of these issues can have a significant impact on HEIs' overall functioning. Therefore, university staff must be provided with the support they need to cope with occupational stress.

2.7 Barriers to mental health care and support in the workplace

Mental health care in workplaces, including universities, encounters numerous barriers that hinder access to support and adversely affect staff well-being. This section explores these barriers in detail.

2.7.1 Stigma

Stigma is a major barrier to accessing mental health care in the workplace, as individuals may hesitate to seek help for fear of discrimination or judgement (Lund et al. 2012:404). Kakuma et al. (2010:122) concur, adding that many employees may feel uncomfortable disclosing their mental health issues to their employers, fearing repercussions such as discrimination, lack of job security and career mobility. People with mental illness are often ostracised and marginalised in society, leading to shame and isolation (Petersen & Lund, 2011:755; Barkway, 2006:133). This demonstrates that the stigma associated with mental health issues can prevent people from openly discussing their mental health. Furthermore, this discourages individuals from seeking mental health treatment or support, which can exacerbate their mental health and negatively impact their overall quality of life.

2.7.2 Lack of resources

Mental health care and support in the workplace are often limited by a lack of resources. Research shows that some employers do not have the financial means or expertise to provide the necessary support and resources, such as mental health professionals (Willie, 2017:2). This is due to financial constraints, limited understanding of mental health issues or a reluctance to invest in mental health services. Willie (2017:2) affirms that limited resources often result in employees feeling unsupported, which can lead to decreased productivity, increased absenteeism, and a negative work environment. This implies that a lack of resources can hinder employees' access to mental health services, leading to inadequate management of mental health issues in the workplace. This includes mental health interventions that can be provided in the workplace (Lund et al. 2012:404). Therefore, employees may not receive the help they need, aggravating their mental health problems. This can create a detrimental cycle in the workplace due to inadequate resources, lack of support, and inadequate mental health interventions. Thus, organisations must provide the necessary resources, support, and mental health interventions to break this cycle and ensure effective management of employees' mental health.

2.7.3 Lack of awareness and education about mental health

As both employees and employers may not recognise the signs and symptoms of mental illness, Trump and Hugo (2006:260) assert that lack of awareness and education hinder access to support in the workplace. This suggests they may also be unaware of the resources and interventions available to help support those struggling with mental health issues. Studies show that without proper education and awareness, it is challenging to comprehend and assist employees experiencing mental health problems (Lund et al. 2012:404). A lack of awareness can contribute to stigma, making individuals feel ashamed or embarrassed to discuss their mental health problems in the workplace. To foster a supportive environment for mental health in workplaces like SA HEIs, employers should prioritise educating and raising awareness among their staff about mental health issues.

2.7.4 Data privacy and confidentiality

There is evidence that data privacy and confidentiality issues contribute to workplace barriers to mental health care and support. Edwards and Crisp (2017:227) posit that employees are often reluctant to seek mental health care if they believe their private information might be shared with their employer or manager. Furthermore, if an employer or manager has access to an employee's medical records, they might be less inclined to promote or hire that individual. This indicates that some employees worry about their mental health issues being exposed, which could adversely affect their career prospects. Kagee, Remien, Berkman, Hoffman, Campos and Swartz (2011:86) concurs, adding that some employees fear that their employers or colleagues will discover their mental health issues, which may lead to discrimination or unfair treatment. As a result, employees may avoid seeking help, support or treatment due to fear of being judged or mistreated in the workplace. Thus, concerns about privacy and confidentiality can be a barrier to seeking mental health care.

2.8 Management of mental health disorders

According to Meyer et al. (2019:27), mental health issues are complex to manage, and the effective management of mental disorders is multifaceted, with integrated strategies, comprising pharmacological, physical, psychological and social interventions. The researchers assert that pharmacological strategies refer to the use of drugs or medicines that treat mental health disorders. This means that the drugs are used to directly target the underlying chemical

imbalances in the brain that are responsible for the mental health disorder, thus improving the patient's condition.

Meyer et al. (2019:27) also assert that physical interventions include electroconvulsive therapy, which is a therapeutic strategy for severely depressed individuals. This therapy involves sending electrical currents through the brain, which causes a seizure and helps to reduce the symptoms of depression. It is usually reserved for individuals who have not responded to other treatments.

In terms of psychological interventions for mental health management, cognitive behaviour therapy, psychoeducation, family-based education, and supportive psychotherapy can be used for treatment. These interventions enable individuals to gain insight into their thoughts and feelings, identify and modify unhelpful behaviours, and provide a supportive environment to help them cope with the challenges they face.

Meyer et al. (2019:27) explain that social interventions are geared towards improving mental health management, minimising symptoms, and restricting potentially harmful behaviour. They include "social skills training, housing aid, supported employment, and adaptation to communal life". For example, social skills training may involve educating a person about the impact of COVID-19 in the workplace. Additionally, social interventions may include providing resources for stress management, anxiety, and depression as a result of the pandemic.

2.9 Consequences of poor mental health

Bouzikos, Afsharian, Dollard and Brecht (2022:1) assert that some employers often provide Employee Assistance Programmes (EAP) to employees experiencing work-related and personal issues. This statement suggests that offering EAPs helps employees balance their personal and professional lives. However, evidence shows that employees do not actually utilise EAPs and other mental health programmes due to factors such as stigma, concerns about data privacy, fear of discrimination or job loss, or simply a lack of awareness of these programmes (Govender, 2021:21). Vandayar (2021:246) argues that failing to address employees' mental health needs at an early stage, results in not only individual and organisational consequences but also increased organisational costs as shown in Table 2.3 below.

Table 2.3: Consequences of unaddressed mental health issues

Individual consequences	Organisational consequences	Organisational costs
Health problems **Physica**l: Back problems, Musculoskeletal, Cardiovascular disease, Irritable bowel syndrome, Ulcers, migraines, skin, impaired immune function **Mental**: Depression, anxiety, trauma, PTSD, Bipolar disorder etc.	**Absence from work** • Sickness absence • Absence of family issues • Arriving late/leaving early • Disability absence **Accidents/errors** • Increased accidence rate • Increased error rate **Disciplinary issues** • Increased discipline problems • Increased grievance issues • More time dealing with employee personal issues **Morale/motivation** • Team relation issues • Low employee motivation **Turnover** • High employee turnover • High training costs • Loss of knowledge/expertise **Additional** • Presenteeism • Poor customer relations • Violence at work • Vulnerable to litigation • Poor company image • Quality control problems	• Sick pay • Temporary employee replacement costs • Disability payment medical claims • Equipment repair/replacement costs • Supervisor time/salary • Disciplinary costs • Recruitment costs • Training costs • Redundancy/early pension costs • Loss of customers • Litigation costs • Increased insurance premium payments
Behavioural • Increased alcohol/drug use • Poor interpersonal communication • Eating problems (Over/under) • Sleeping problems • Increased smoking • Poor work-life balance • Increased aggression/irritability • Reduced patience		
Cognitive • Reduced concentration/focus • Poor judgement/perspective • Reduced creativity • Rigid/obsessive thinking • Reduced motivation • Reduced commitment		

Source: Vandayar (2021:246)

The consequences of a lack of attention to mental health issues in the workplace include health problems such as physical back problems, musculoskeletal, cardiovascular disease, irritable bowel syndrome, and migraines, among others as illustrated in Table 2.3. In addition, there are mental health problems such as depression, anxiety, trauma, PTSD, bipolar disorder, hypomanic episodes, manic episodes and lifestyle diseases. Other individual consequences are linked to behavioural and cognitive aspects. These conditions can lead to organisational consequences such as an increase in absenteeism, accidents/errors, disciplinary issues, morale/motivation concerns, turnover issues and other additional concerns. These organisational consequences can have numerous costs and some of them include: sick pay; temporary employee replacement costs; disability payment medical claims; equipment repair/replacement costs; supervisor

time/salary; disciplinary costs; recruitment costs; training costs; redundancy/early pension costs; loss of customers; litigation costs and increased insurance premium payments all of which can harm the organisation.

Vos, Abajobir, Abate, Abbafati, Abbas, Abd-Allah, Abdulkader, Abdulle, Abebo, Abera, and Aboyans (2017:1229) conducted a systematic analysis of the global burden of disease study and found that 1.1 billion people worldwide experience mental health issues and substance use, with depressive disorders being the most prevalent. Furthermore, there is evidence shows that developing countries, including SA, face the highest number of mental health issues, which are associated with violence and trauma, poverty and hunger, as well as limited or in some cases non-existent access to mental health services (Wang, Aguilar-Gaxiola, Alonso, Angermeyer, Borges, Bromet, Bruffaerts, De Girolamo, De Graaf, Gureje & Haro 2007:848; Kohrt, Hruschka, Worthman, Kunz, Baldwin, Upadhaya, Acharya, Koirala, Thapa, Tol & Jordans, 2012:272). Despite this high prevalence, research shows that developing nations invest less than 3% of their health budgets in mental health care although mental diseases account for 25.5% of disability years lived (Meyer et al. 2019:27). This indicates that developing nations require increased mental health investments to address growing needs.

2.10 Summary

This chapter has developed a context for SA HEIs, highlighting key details about their nature and purpose. A case study was employed to provide an overview of the SA HEI. It also explained university staff roles and responsibilities and explored key factors contributing to their mental health issues including workload management, transformation, decolonisation, talent management, globalisation and internationalisation and COVID-19. In addition, the chapter contextualised mental health by defining it and discussing its benefits. The study argued that mental health relates to the essence of who individuals are and the way they get involved, connect, learn, work, and how they feel happiness and experience suffering (UN, 2020: 5). In light of this, the study argued that mental health is more significant than ever. Its primary value is that it affects all aspects of human life.

Although there are several types of mental health disorders, the study considered depression, anxiety, trauma, PTSD, and bipolar disorder. Importantly, the research explored occupational stress and burnout, which are frequently associated with workplace mental health problems in SA HEIs. However, it is worth noting that occupational stress and burnout are not fully recognised as

mental health issues by the (WHO, 2019, n.p) even though they contribute to the development of mental health problems. The chapter also discussed several barriers to mental health care including stigma, lack of resources, lack of awareness and education about mental health, as well as data privacy and confidentiality. It was noted that these barriers present challenges to accessing mental health care and support, negatively impacting staff well. This highlights that mental health issues are complex to manage, and the effective management of these disorders is multifaceted, with integrated strategies, comprising pharmacological, physical, psychological, and social interventions (Meyer et al. 2019:27). It was concluded that poor mental health has many consequences, including individual and organisational consequences, and organisational costs.

Despite numerous barriers to mental health care and the serious consequences of poor mental health care, the study suggests that SA HEIs can improve mental health care through e-health tools. These technologies can make mental health care more accessible, affordable, and efficient for university staff (UN, 2017: 32). In addition, they can reduce the barriers to mental health care (Hanisch, Twomey, Szeto, Birner, Nowak & Sabariego, 2016:9). As such, the introduction of e-health tools could have a positive impact on mental health care and lead to improved mental health outcomes in SA HEIs. At present, it appears that conversations concerning technology-driven mental health interventions continue to dominate the literature (Kowatsch et al. 2019:260). This indicates that technology-driven mental health solutions remain a priority in the field and are likely to be further explored in the near future. Considering this, policymakers must have empirical evidence to make informed decisions on the long-term adoption of e-health tools for DMHS. Therefore, the following chapter will continue the literature review by discussing the concept of e-health tools and DMHS in detail.

CHAPTER THREE

THE CONCEPT OF E-HEALTH TOOLS AND DMHS

3.1 Introduction

This chapter expounds on the concept of e-health tools and DMHS and is divided into five sections. The first section broadly explains the concept of e-health tools. The second section discusses various forms of e-health tools for delivering DMHS. The third section explains different types of DMHS. The fourth section details digital mental health responses during the COVID-19 pandemic at University X. The fifth section discusses the utilisation of e-health tools and user experiences gained during the COVID-19 pandemic.

3.2 The concept of e-health tools

The term electronic health, commonly known as e-health, became popular in literature in early 2000 and thereafter definitions of the term have differed in the literature depending on the functions, technology uniqueness and the stakeholder perspective (Pagliari, Sloan, Gregor, Sullivan, Detmer, Kahan, Oortwijn & MacGillivray, 2005:16). Over the years, numerous studies have been conducted on e-health, and the term e-health has been applied in various contexts, resulting in multiple interpretations. In some cases, e-health still lacks a universally accepted definition across studies (Shaw, McGregor, Brunner, Keep, Janssen & Barnet, 2017:2). The lack of a consistent definition has also created uncertainty among academics, policymakers, providers, and end-users of e-health tools (Pagliari et al. 2005:1). Based on this, this study examines selected definitions to establish a working definition that will be applied consistently throughout the research.

In literature, the most widely used definition of e-health is that of Eysenbach (2001:1) who defines it as “an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the internet and related technologies”. This suggests e-health is more than technology; it is a mindset of global interconnectedness aimed at improving healthcare worldwide through ICT. While this definition is useful, it needs to be adapted and contextualised for this study where e-health tools are considered specifically for the delivery of DMHS.

WHO (2016:11) defines e-health as the cost-effective and safe utilisation of ICTs in support of health and health-related disciplines such as health-care services. Safi et al. (2018:2) support the latter by stating that e-health is a broad concept that involves utilising and integrating advanced ICTs to treat and care for patients. The usefulness of this definition is that it regards technology as a tool that enables a process, function, or service, for instance, a health website on the internet The value of this definition lies in its view of technology as a tool that facilitates a process, function, or service, such as a health website on the internet. (Oh, Rizo, Enkin & Jadad, 2005:9). Therefore, the use of ICTs in health and related disciplines aims to expand, support or enhance human activities, rather than replace them. As Eyesenbach (2001:1) argues, e-health increases efficiency, enhances quality, empowers patients, encourages a true relationship between patients and the health professionals, educates patients, facilitates the exchange of information, extends healthcare beyond traditional boundaries, and ensures equitable access to health care. Considering this, e-health has the potential to transform DMHS, resulting in improved outcomes and enhanced quality of life.

Based on the aforementioned definitions, e-health is established as a broad category of health-related ICT-based tools that process information electronically and are utilised to support and manage patient mental health care. In other words, e-health is used to refer to the utilisation of multiple ICTs tools that support the delivery of DMHS in personalised or group mental health initiatives (Gooding, 2019:1). Examples of e-health tools include desktop computers, laptops, smartphones, tablets, and other mobile devices and applications. These e-health tools serve various functions including but not limited to communication, sharing mental health information, promoting mental health online, enhancing mental health literacy, storing and accessing information, providing clinical decision support, monitoring patients or populations, delivering internet-based cognitive behavioural therapy, and aiding in the diagnosis, prevention and treatment of patients (Gooding, 2019:3; Asi & Williams 2018:116; Schueller, Washburn & Price, 2016: 145).

The use of e-health tools facilitates mental health service delivery in the workplace by influencing the design and accessibility of these services. More critically, it affects how mental health services are provided in both formal and informal workplace settings (Howarth, Quesada, Silva, Judycki & Mills, 2018:2). Furthermore, the utilisation of e-health tools is increasingly gaining popularity worldwide as various countries are recognising that modern ICTs and internet access have become an integral and inseparable part of daily life (Aungst & Patel, 2020:1). On one hand, individuals rely on the internet as their primary source for health-related information and

communication. On the other hand, organisations are increasingly adopting e-health tools to deliver mental health services, driven by the COVID-19 crisis and government policies and regulations (Fagherazzi et al. 2020:6). Consequently, this creates an exciting opportunity for mental health providers to leverage digital technology to enhance service delivery and improve mental health outcomes. Capitalising on this opportunity can reduce the stigma associated with mental health issues and foster a more inclusive environment where individuals feel comfortable seeking support (Hanisch, et al. 2016:9).

As previously mentioned, e-health tools rely on internet connectivity and computers and can be accessed through various devices, including smartphones, tablets and mobile applications (Mwangama et al. 2020:7; Fairburn & Patel, 2017:19). The internet is one of the world's most rapidly advancing technologies, continually presents new opportunities for digital mental health care. Its growth and evolution have significantly impacted how people communicate, share information, stay connected, and, most crucially, access DMHS. Thus, it is unsurprising that authors such as Salahuddin and Gow (2016:1142) report that both developed and developing economies are increasingly adopting measures to enhance internet usage within their countries. The same authors further assert that internet usage in SA has been growing at a rapid pace, allowing the country to catch up with developed economies. Considering this, it is crucial to examine the most recent data on internet access in SA's latest internet access data by location, urban or rural status, and province, as presented in Table 3.1.

Table 3.1 shows that the Western Cape (25,9%) and Gauteng (16,4%) provinces had the highest rates of household internet access, whereas Mpumalanga (1,7%) and Limpopo (1,9%) had the lowest. Internet availability was 17,2% in metropolitan areas, while rural areas had only 1,2% access. In the Eastern Cape (0,2%), North West (0,3%) and KwaZulu Natal (0,2%) provinces internet access was even lower, remaining below 1%. The percentage of households with access to the internet at work (17.6%), internet cafes (13.6%) or educational institutions (13.6%) is higher than the percentage of households with access at home (10.4%). Gauteng (27.8%) and the Western Cape provinces (22.2%) had the highest proportion of households accessing the internet at work, while the North West province (6.6%) had the lowest percentage.

Table 3.1: Households' access to the internet

Place where Internet is accessed	Rural/ Urban status	Province (per cent)									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
At home	Metro	30,3	10,7	-	12,1	10,2	-	16,5	-	-	17,2
	Urban	18,3	5,1	6,7	5,1	10,0	5,2	15,4	2,5	4,4	8,8
	Rural	12,2	0,2	4,1	4,5	0,2	0,3	29,7	1,0	1,3	1,2
	Total	**25,9**	**5,0**	**5,9**	**7,1**	**6,4**	**2,4**	**16,4**	**1,7**	**1,9**	**10,4**
At work	Metro	20,4	16,2	-	18,8	27,9	-	29,0	-	-	26,1
	Urban	27,9	11,8	18,1	9,4	22,3	13,0	20,1	10,0	17,8	17,1
	Rural	11,9	7,2	5,8	8,9	3,2	1,7	9,1	4,4	4,8	4,6
	Total	**22,2**	**11,3**	**14,4**	**12,1**	**17,3**	**6,6**	**27,8**	**6,8**	**7,3**	**17,6**
Using mobile devices	Metro	75,4	61,7	-	62,8	83,5	-	72,4	-	-	73,4
	Urban	78,9	73,2	64,3	66,3	80,8	72,9	74,5	68,7	79,1	73,7
	Rural	55,0	53,6	52,9	72,5	57,8	61,7	63,2	66,3	57,5	59,2
	Total	**75,4**	**60,5**	**60,8**	**66,0**	**73,2**	**66,5**	**72,6**	**67,3**	**61,7**	**69,4**
At Internet cafes or educational facilities	Metro	17,1	12,5	-	5,8	28,2	-	23,2	-	-	21,6
	Urban	18,3	1,6	1,4	6,5	7,4	3,6	24,6	18,8	1,7	11,1
	Rural	3,7	1,3	0,0	11,3	3,9	2,7	16,9	8,1	1,5	3,5
	Total	**16,8**	**5,4**	**1,0**	**6,9**	**14,4**	**3,1**	**23,3**	**12,7**	**1,5**	**13,6**

Source: Statistics SA (2022:46)

One-third of the SA population, or around 22 million individuals own a mobile device that can be used to access the internet (Rabe, 2022:2). To this end, Table 3.1 above shows that mobile internet connectivity has made the internet considerably more accessible to rural households. Across the country, mobile device internet access (69.4%) accounted for the most frequently utilised method of internet connectivity. Although mobile internet access devices are less common in rural areas (59.2%) than in urban and metro areas (73.7% and 73.4%), they remain the predominant method of internet access in rural areas. This indicates that rural areas are becoming increasingly connected through mobile internet access devices, even though there remains a gap between urban and rural usage.

3.3 E-health forms for DMHS

Since their inception, various e-health tools have been used for DMHS, and several studies have investigated their effectiveness. This section, therefore, discusses various e-health forms for DMHS to provide more insight into how they are accessed and used effectively. Additionally, it helps identify the strengths and weaknesses of each form, enabling the sustainable delivery of DMHS.

3.3.1 M-health

WHO (2017:31) defines m-health as the use of mobile devices to improve public and medical health care, including mental health. Mobile devices include mobile phones, patient monitoring devices, personal digital assistants, and wireless devices. Due to their large-scale penetration in developing countries like SA, m-health has emerged rapidly over the years to help deliver health and information services including mental health care. The global number of mobile phone users has been growing exponentially, with the most significant increase occurring in developing countries, which account for more than 5.5 billion users (WHO, 2016:28). In Africa, it is estimated that e-health tools such as mobile devices account for 90-98% of all internet connections (Mwangama et al. 2020:7). Given the rise in mobile phone ownership, including among socioeconomically disadvantaged individuals, mobile phones have become a relatively affordable method for delivering information through m-health (Norris, Swartz & Tomlinson, 2013:381). Vally (2006:156) states that the internet offers a huge potential for reaching many people in SA with e-health tools for DMHS. Moreover, Moock (2014:2) reports that the internet can connect individuals who might not otherwise meet, particularly those separated by time and location. The benefits typically include access to valuable information and good opportunities for social support. The sustainable adoption of m-health can significantly impact DMHS in SA HEIs due to internet connectivity and application compatibility of smartphones (UN, 2017: 32). Therefore, this potential could be used to facilitate more accessible, equitable and cost-effective mental health services for university staff in SA HEIs.

Today's mobile smartphones are equipped with several interesting functions such as short messaging service (SMS), cameras, applications, a global positioning system, streaming, podcasts, and other features (Norris et al. 2013:381-385). These features present opportunities to SA HEIs for more user engagement, enhanced facilitation, and improved treatment process (Price, Yuen, Goetter, Herbert, Forman, Acierno, & Ruggiero, 2014:2). Thus, SA HEIs can leverage m-health to address COVID-19 mental health concerns by focusing on providing information and raising awareness, offering diagnosis and treatment, facilitating consultations, and enhancing the dissemination of mental health resources to university staff (WHO, 2012:79). In this way, m-health can enhance mental health support for university staff by delivering timely interventions and improving access to specialist services during crises.

SMS text messages, which may be delivered to any mobile phone user, have a broader audience than mobile applications and are cost-effective (Mbunge, Batani, Gaobotse & Muchemwa,

2022:3). Furthermore, they allow for instantaneous communication with a large group of people, providing an excellent platform for digital mental health promotional campaigns. Researchers such as Hassounah, Raheel and Alhefzi (2020:7) assert that SMS text messages were heavily used during the recent pandemic. The scholars further claim that SMS text messages were also used to undertake preventative measures during the COVID-19 epidemic. They also posit that SMS messages served as reminders, encouraged compliance, and promoted health awareness, providing crucial home-based support during the pandemic.

SMS text messages for mental health services are not new in SA, even though there is potential to expand their reach and effectiveness through new communication channels. A research study by Tomita, Kandolo, Susser and Burns (2016:7) demonstrated that depression screening using SMS-based solutions is a practical, palatable, and trustworthy alternative for mental health care in low-resource countries like SA. This is despite possible adoption constraints including network and other system issues. In this regard, SMS-based solutions can effectively and affordably deliver DMHS in low-resource countries, reaching individuals who might otherwise lack access to mental health support.

Research on m-health for the management of mental health has primarily been conducted in cognitive behavioural therapy (Bidargaddi, Schrader, Klasnja, Licinio and Murphy, 2020:7; Röhricht, Padmanabhan, Binfield, Mavji & Barlow, 2021:14). Through cognitive behavioural therapy, patients can explore and address how their thoughts, feelings, and behaviours are contributing to their issues. Rooksby, Elouafkaoui, Humphris, Clarkson and Freeman (2015:84) elaborate further that cognitive behavioural therapy is typically used in a structured manner with a professional therapist. During these sessions, a patient's distorted thinking and beliefs are modified, resulting in changes in behaviour. One of its advantages is that it helps patients become aware of negative thoughts, enabling them to view challenging situations with greater clarity and respond to them more effectively (Moock, 2014:3). As Watts, Mackenzie, Thomas, Griskaitis, Mewton, Williams and Andrews (2013:9) explain that m-health is particularly well suited for cognitive behavioural therapy due to its structure and emphasis on homework as a means of learning. Furthermore, the authors highlight that m-health offers a significant advantage for cognitive behavioural therapy by enabling the recording and categorisation of anxiety-inducing events as and when they occur. A further point made by Bidargaddi et al. (2020:2) is that since people are constantly near their phones, m-health can detect change over time by utilising passive sensing and real-time evaluation capabilities. Such capabilities make it easier to identify patterns, track progress, and identify areas of improvement, thereby providing a more comprehensive and

accurate evaluation of an individual's health over time. This also provides the potential for the early identification of mental health issues and timely interventions to support those in need. Moreover, m-health may expedite the completion of cognitive behavioural therapy and encourage participation by enabling some activities to be carried out independently of the therapist, owing to their portability (Norris et al. 2013:381).

Modern smartphones, have many useful features and can connect to mental health care applications, usually known as applications. Despite the evidence that not everyone owns a smartphone, DMHS are becoming more popular and sought after (Mbunge et al. 2022:3). Hsu and Lin (2015:46) note that smartphone applications usage has grown rapidly alongside the increase in smartphone ownership. As smartphones become more accessible, both developing and developed nations are harnessing mental health applications to improve their citizens' mental health (Price et al. 2014:434; Mahoney, Elders, Li, David, Haskelberg, Guiney, & Millard, 2021:9; Mbunge et al. 2022:3). For instance, 'THIS WAY UP' in Australia provides mental health services to those who are experiencing signs of anxiety and depression, while 'Just a Thought' in New Zealand provides free access to online psychological assistance and education (Mahoney et al. 2021:2). In SA, 'DrConnect' and 'Hello Doctor' are examples of applications that provides DMHS (Mbunge et al. 2022:5). Research shows interesting findings about the utilisation of smartphone applications. Gupta (2013:3), for example, suggests that, on average, smartphone users spend 82% of their mobile minutes utilising mobile applications, with the remaining time being spent on making calls, sending text messages, emails and other activities. In light of these findings, Price et al. (2014:428–429) argue that mobile applications present a unique opportunity to enhance user engagement by offering immediate psychological support. They also facilitate improved treatment processes and help sustain gains after sessions of therapy. Norris et al. (2013:381-385) concurs, adding that applications help users evaluate themselves and increase their self-awareness. Other researchers posit that the value of applications rests in their capacity to improve, supplement, and promote cognitive behavioural therapy interventions including psycho-education (Clough, Rowland & Casey, 2019:7). Wang, Kung and Byrd (2018:3) assert that applications are beneficial since they facilitate more accurate reporting, contribute to predicting future health outcomes, ensure secure storage of patient data, and allow for referrals. Applications are beneficial because they facilitate more accurate reporting and streamline the referral process. However, the use of mobile health applications for healthcare services such as DMHS is plagued with many challenges that detract from their effectiveness. Some of the challenges were detailed in a study by Mbunge et al. (2022:5), including sporadic internet access, network issues causing

reporting delays, private and security concerns, and limited availability of smartphones capable of supporting mobile health applications.

3.3.2 Telehealth

Telehealth, often known as telemedicine, is the remote provision of medical services, particularly mental health, via the use of ICTs (Tuckson, Edmunds & Hodgkins, 2017:1585). This means telehealth bridges the geographic separation between the patient and the clinician (Snoswell, Taylor, Comans, Smith, Gray & Caffery, 2020:2). Telehealth is generally utilised in real-time (synchronously), either through a phone call or a short video, and it can be utilised asynchronously, in which a recorded stored message is delivered via email, video, or any other telephonic means (WHO, 2017:60). The efficacy of telehealth is that it can be used by SA HEIs to provide university staff with mental health services to alleviate depression, stress, and other related maladies (Asi & Williams, 2018:116). The main advantage of telehealth to SA HEIs is that it is feasible and can be generally accepted by end-users and providers. Telehealth is cost-effective, provides privacy, and can be accessed at any time and from any location (WHO, 2017:60). As Tuckson et al. (2016:1585) concur that telehealth contributes to improved patient experiences, improved public health, and reduced health care costs per person.

A systematic literature review study by Mbunge et al. (2022:5) indicates that telehealth services include a wide range of remote medical services, including telepsychiatry, teleconsultation, and telerehabilitation, among others. The researchers further report these were widely utilised during the recent pandemic in SA. Due to travel restrictions and the consequent absence of in-person medical care, research shows that COVID-19 altered traditional means of obtaining medical care (Monaghesh & Hajizadeh, 2020:2). In this regard, Kamulegeya, Bwanika, Musinguzi and Bakibinga (2020:2) assert that owing to telehealth's ability to facilitate patient-doctor interactions without physical interaction, COVID-19 has largely contributed to a surge in telehealth, especially in the delivery of DMHS in resource-constrained settings. Furthermore, Monaghesh and Hajizadeh (2020:7) assert that telehealth enables teleconsultation, in which people may obtain medical assistance and advice from health practitioners on a variety of medical issues, including mental health. The researchers also posit that teleconsultations were conducted in a safe environment during the pandemic. This was because patients and mental health practitioners could interact remotely, reducing the risk of transmission.

Although telehealth has its benefits, there are drawbacks associated with its use. For example, patients may not receive the same level of service as they would in an in person-consultation with a mental health practitioner (Lipschitz, Connolly, Van Boxtel, Potter, Nixon & Bidargaddi, 2022:5). Technical problems, such as a loss of internet connection, can disrupt consultations, especially given the current frequent and unpredictable load shedding issues in SA (Reese, Slone, Soares & Sprang, 2015: 280). Additionally, patients may not always be forthcoming about their symptoms or may withhold key information, potentially leading to a misdiagnosis. However, with the right measures in place, Mbunge et al. (2022:8) conclude that telehealth has the potential to provide meaningful and effective digital mental health care.

3.3.3 Social media

Wankel, Marovich and Stanaityte (2010:242) define the term social media as a form of interactive technology that allows the creation and sharing of information through online platforms. They are often regarded as platforms where people connect, exchange ideas, and interests and establish relationships, especially among people with similar interests or backgrounds. For example, social media platforms such as Instagram, WhatsApp, and X formerly known as Twitter, YouTube, LinkedIn, TikTok, Facebook and many others allow users to post photos, videos, and messages and interact with each other (Duffett, 2015:43). With this, users can engage with each other and create online communities of people with similar interests. Sawyer and Chen (2012:165) argue that through connecting people, social media can foster a sense of community and allow for the exchange of information in a way that can be beneficial to all users. For example, online discussion forums, Facebook groups, WhatsApp groups, and X (Twitter) hashtags provide people with a platform to share their experiences and gain knowledge from others in the community. In the delivery of DMHS in SA HEIs, social media platforms can be used to create online support groups for individuals with similar mental health issues. Korda and Itani, (2013:21) continue further and state that social media simplifies content creation and information sharing with a much broader audience than conventional media allows.

According to Sparta (2012:16), a key characteristic of social media platforms as an interactive technology is their pervasiveness, which makes them fascinating. In line with this, Gwaka (2015:14) assert that millions of individuals have embraced social media platforms as a result of their proliferation, accessibility, and affordability. In the context of mental health care, Kruzan, Fitzsimmons-Craft, Dobias, Schleider and Pratap (2022:10) point out that social media platforms have become increasingly popular among individuals who use them to connect, engage, and seek

help when they are experiencing mental health problems. Researchers have demonstrated, for instance, that people share their mental health problems, and seek help from others on social media platforms (Cunningham, Hudson & Harkness, 2021:251; Padín, González-Rodríguez, Verde-Diego & Vázquez-Pérez, 2021:14; Saud, Mashud & Ida, 2020:8). As explained in the previous chapter, many countries including SA adopted numerous containment and mitigation measures to prevent the spreading of COVID-19 virus transmission and restricted the movement of people. To this end, social media platforms were particularly effective for connecting individuals, spreading awareness, and disseminating information about mental health issues (Saud et al. 2020:8). This suggests that these platforms allowed people to easily connect with their peers and discuss their challenges in a safe online environment. It also implies that social media allows people to access educational resources, such as articles and videos on mental health issues. This may have increased awareness and encouraged more people to seek help.

However, social media can also have a negative impact. Social media can be a platform for cyberbullying and spreading false information (Giumetti & Kowalski, 2022:4). Cyberbullying can have a devastating effect on the victims, often leading to depression and anxiety. False information can be problematic, as it may lead individuals to make decisions based on inaccurate information. Furthermore, research shows that excessive use of social media can lead to addiction, especially for those who spend significant time engaging online (Leung, 2014:435).

3.3.4 The 4IR

Zorzenon, Lizarelli and Daniel (2022:2) assert that the 4IR (industry 4.0) denotes significant technological, industrial, societal, and process changes happening in the 21st century due to digitalisation and increased connectivity. A further distinction is that of Moosavi, Bakhshi and Martek (2021:3) who consider 4IR to be a digital transformation driven by ICTs that promote machine-human interaction to optimise systems. The scholars also assert that the main goal of the 4IR is to increase efficiency and productivity through data-driven automation carried out in real-time. In view of this, 4IR, therefore, involves the integration of a complex set of technologies into human and business operations. As technology advances, the health care sector has become one of the most affected industries. Gomes de Melo e Castro e Melo and Araújo (2020:328) affirm that the 4IR is profoundly influencing how healthcare is delivered and how governments and stakeholders engage with patients and healthcare professionals. Some of the 4IR technologies that are impacting health care delivery include but are not limited to artificial intelligence, machine learning, virtual reality, Internet of Things and cloud computing. It is thus imperative to explore

each of the aforementioned 4IR technologies separately to better understand how they aid in the delivery of DMHS.

3.3.4.1 Artificial intelligence

Artificial intelligence denotes computer capabilities that resemble human intelligence (Moosavi et al. 2021:3). It consists of hardware and software systems designed to mimic the reasoning and judgment of human beings (Zorzenon et al. 2022:7). Researchers such as Bai, Dallasega, Orzes and Sarkis (2020:3) concur in this regard. They indicate that artificial intelligence emphasises the development of intelligent machines, computers, or systems with sophisticated algorithms capable of functioning like humans in various aspects such as perception, learning, problem-solving and decision-making. Recently, artificial intelligence has been utilised in the delivery of DMHS. Web-based and mobile applications have been developed using artificial intelligence to improve user experience and customise DMHS interventions and support social suicide prevention initiatives (D'Hotman & Loh, 2020:3; D'Alfonso, 2020:112). D'Alfonso (2020:113) asserts that predictive and detection models for mental health conditions are being utilised using data-driven artificial intelligence technology. This essentially collects information from multiple sources, including social media interactions and personal digital device usage. Thus, these sources are used in data mining to gain insight into patient behaviour including mental health. However, Navarro, Damen, Takada, Nijman, Dhiman, Ma, Collins, Bajpai, Riley Moons and Hooft (2021:7) contend that predictive and detection models can become biased and inaccurate if trained on unrepresentative or biased data, suggesting that they need to be developed and utilised with caution, particularly in DMHS. Therefore, to maximise the efficacy of data mining in DMHS, careful consideration must be given to the data sources used.

3.3.4.2 Machine learning

Machine learning, a 4IR technology within artificial intelligence, is transforming the provision of DMHS by focusing on the development of computer programmes which when fed with data, teach themselves to learn, understand, reason, plan and act accordingly (Magwegwe, 2021:266). Machine learning uses historical data to analyse problems, identify patterns, and suggest suitable solutions (Moosavi et al. 2021:4). The main benefit of machine learning is that it aids in making predictions or decisions without being explicitly programmed to do so (Liu, Feng, Ahmed, Shahid & Guo, 2022:2). Machine learning algorithms are often utilised in a broad range of applications, including DMHS, where it might be challenging or impractical to design traditional algorithms that

capable of carrying out tasks efficiently (Magwegwe, 2021:266). Research shows that technologies like machine learning are effectively used to analyse and monitor mental health conditions such as depression and anxiety. For example, Burdisso, Errecalde, and Montes-y-Gómez (2019:189) developed machine learning models that accurately predicted depressive symptoms using text data from Reddit, a popular social media platform. Thus, machine learning could potentially be an effective tool for early depression detection amongst social media users and could strengthen well-established depression detecting practices.

Araújo (2020:328) concluded that the usefulness and efficacy of machine learning in developing nations like SA, where rising mortality rates are linked to a shortage of medical professionals, lies in its ability to assist in future predictions, potentially benefitting patients. In this manner, machine learning and artificial intelligence could provide more precise diagnoses and comprehensive medical history data, helping reduce mortality and aid decision-making by predicting health conditions and illnesses.

However, Ray, Bhardwaj, Malik, Singh and Gupta (2022:4) argue that machine learning and artificial intelligence could never completely replace the expertise and intuition of experienced mental health practitioners. The researchers argue that while e-health tools and related technologies offer valuable support, they cannot fully capture the complexity of mental health. Overreliance on these tools could result in numerous errors and misdiagnoses. The justification for this argument is that experienced mental health practitioners make more accurate diagnoses given their knowledge, skills, experience and subtle cues from their patients. Machines, on the contrary, lack intuition and can only make diagnoses according to the data given to them.

3.3.4.3 Virtual reality

Virtual reality, another 4IR innovation, is transforming DMHS by using computer-generated simulations to immerse users in virtual environments (Bai, Dallasega, Orzes & Sarkis, 2020:3). This implies that users of virtual reality can experience immersion in a real-world environment even when they are not actually there. The following components are generally found in virtual reality systems: visual processing units, 3D stereo displaying units, monitoring systems, and additional components such as joysticks and sensory gloves that enable a sense of touch stimulation (Baghaei, Chitale, Hlasnik, Stemmet, Liang and Porter, 2021:2). Oculus Quest 2, HTC Vive, and Sony PlayStation virtual reality, Samsung Gear virtual reality, Google Cardboard, and virtual reality head-mounted displays are some of the examples of virtual reality, which all enable

users experience a virtual setting (Baghaei et al. 2021:2; AlAwadhi, AlHabib, Murad, AlDeei, AlHouti, Beyrouthy & Dan Al-Kork, 2017:2).

Virtual reality has been utilised as a clinical tool in studies involving mental health and in therapeutic settings, with effective results (Baghaei, et al. (2021:9). Furthermore, a study carried out by Bell, Nicholas, Alvarez-Jimenez, Thompson and Valmaggia (2022:174) found significant evidence that demonstrates virtual reality's effectiveness as a mental health assessment tool, including a greater capability to manipulate and control experimental conditions. Thus, research and clinical practices in mental health could benefit significantly from improved methodological quality and the ability to conduct more precise and personalised assessments of individuals. However, Bell et al. (2022:174) cautioned that adopting virtual reality into clinical and research settings is not without its challenges, including cost, accessibility, and technical challenges.

3.3.4.4 Internet of Things

'Internet of Things' is another 4IR technology that is also transforming how DMHS are delivered. Moosavi et al. 2021:3 define it as a network of physical objects, such as devices, machinery, or appliances, that have sensors, software, network connectivity, and computational capability built in to collect, share, and act on information, typically without human intervention. The Internet of Things is regarded as a revolutionary and rapidly developing 4IR technology in which everything (smart objects and smart devices) is interconnected via the internet to facilitate real-time data collection and information sharing (Zorzenon et al. 2022:7). Singh (2018:224) argues that one industry where the Internet of Things is flourishing is health care. One reason for this growth is the increasing number of internet-connected devices, with even more anticipated in the future (Kelly, Campbell, Gong & Scuffham, 2020:2). The Internet of Things can be viewed as any portable device that can collect health related data and connects to the internet, including computer devices, mobile phones, wearables, and other devices (Dang, Piran, Han, Min & Moon, 2019:1). Considering this, the Internet of Things is significant to the health care because it may assist patients in monitoring their mental health through wearable technology and medical sensors that can continuously record essential information through tracking and health monitoring. Hence, Internet of Things through networked devices enables the collection of detailed data to assess the patient's physical and mental health conditions by measuring body temperature, blood pressure, and sugar levels (Singh, 2018:224). In the event of a medical emergency, such as a spike in blood pressure, Internet of Things-based medical devices can alert a healthcare practitioner or family members. Moreover, the Internet of Things also makes it

possible to diagnose mental health disorders early, allowing patients to begin therapy before the condition becomes severe. (Singh, 2018:224). According to Kelly et al. (2020:2), the Internet of Things in mental health care could transform current care delivery models into hybrid systems, enabling the health system to leverage its existing workforce in more innovative and effective ways. Furthermore, Kelly et al. (2020:3) believe that this model of health care delivery encourages better self-management since most patients, over 90%, manage their own lifestyles outside of clinical settings and hospitals, suggesting it is imperative to equip individuals with tools for effective health management.

3.3.4.5 Cloud computing

In the context of the internet, cloud computing is an on-demand, self-service technology that allows users to use computer resources from anywhere in the globe at any time (Kuo, 2011:2). Other researchers define cloud computing as an internet-based enterprise services and applications, such as cloud storage, servers, and software (Moosavi et al. 2021:3). This definition suggests that cloud computing is an ICT service that allows data access and storage via the internet. For instance, cloud computing provides users with the ability to store and access data remotely using devices such as smartphones, tablets, and laptops. Cloud-based computing has many advantages over on-premises computing in terms of data collection, storage, and transmission between connected devices (Lustgarten, Garrison, Sinnard & Flynn, 2020:28). With cloud computing, patients can access their electronic and personal health records online in real-time (Kuo, 2011:6). Electronic health records are computerised systems that deliver real-time, patient-centred records that provide quick and safe information to authorised users (WHO, 2012:78). They typically contain patient information, including medical history, diagnosis, treatment, medications, and links to related services (WHO, 2012:78). Personal health records, on the other hand, refers to computerised health records that an individual creates and maintains to manage their health (WHO, 2012:78). The individual can choose to keep the personal health records private or to make it available to healthcare providers, such as mental health care professionals. Wiljer, Urowitz, Apatu, DeLenardo, Eysenbach, Harth, Pai and Leonard (2008:2) state the main benefit of utilising personal health records is that they retain information of the user depending on their mental health history.

For health care to remain cost-effective, efficient, timely, and of high quality, Kuo (2011:2) believes continuous and systematic innovation is essential. Martinez-Martin and Kreitmair, 2018:2) further argue that innovation is even more imperative due to the sensitivity of the data of patients. Thus,

new technologies and processes can provide drastic improvements in the storage of patient data. Lustgarten et al. (2020:28) assert that cloud computing makes it possible to store patient data online (cloud) rather than locally. By storing the data on the cloud, it can be accessed from anywhere, allowing medical practitioners to access patient information promptly and effortlessly. This eliminates the need for a physical location to store and manage data, increasing the efficiency and accuracy of healthcare records (Kuo, 2011:10). Moreover, Lustgarten et al. (2020:28) argue that cloud computing reduces the risk of data loss due to fire, flood, natural disaster, and theft and this increases security, as the data is not stored on a single computer.

Notwithstanding the benefits of cloud computing, there are also some potential risks associated with it. Data breaches are one of the main concerns associated with cloud computing in the healthcare industry. It has been reported that cloud computing databases are sometimes accessed by unauthorised users due to software vulnerabilities, security breaches, and human error (Seh, Zarour, Alenezi, Sarkar, Agrawal, Kumar & Ahmad, 2020:2). As a result, sensitive data can be exposed through data breaches. The study by Seh et al. (2020:5), found that 13.49 million health records were exposed from 2005 to 2009 (5.41% of breaches), and 78.18 million were compromised from 2010 to 2014 (31.38% of breaches). Another potential risk of the utilisation of cloud computing is data loss. Storing data on cloud servers can lead to accidental deletion or corruption of data, which can lead to the loss of sensitive information (Kuo, 2011:7). In conclusion, researchers such as Wies, Landers and Lenca (2021:5) argue that privacy breaches and security vulnerabilities make the use of e-health tools less acceptable. Therefore, it is evident that cloud computing demands robust security measures, requiring organisations to address potential risks when implementing these solutions.

3.4 DMHS

A review of the literature on DMHS reveals that there is presently no universally accepted terminology used to expound on many types of DMHS delivered via the internet and e-health technologies. Terms that have been used to categorise DMHS include web-based therapy, e–therapy, e-counselling, online counselling, e-health, e-mental health, cyber therapy, computer-mediated therapy, e–interventions, and digital interventions, among others. Researchers have made an effort to provide uniform terminologies to classify different types of DMHS, but the lack of clarity and consistency remains a challenge (Barak, Klein & Proudfoot, 2009: 5 – 14; Abbott, Klein & Ciechomski, 2008: 361 – 363; Vally, 2006: 152 – 162). However, the most comprehensive study is that of Barak et al. (2009: 5– 14), who categorise DMHS into four: web-based

interventions, online counselling and therapy, internet-operated therapeutic software and other online activities. This study uses this as a guide to discuss different types of DMHS.

3.4.1 Web-based interventions

Barak et al. (2009: 5) state that web-based interventions are largely self-directed initiatives delivered via a structured online intervention and accessible through a website, often used by individuals seeking DMHS. Web-based interventions include a digital intervention programme that provides health-related information and resources through interactive several web-based components. This enhances and improves people's knowledge, awareness, and understanding of their mental health. Web-based interventions can be divided into three types, and these are discussed below:

3.4.1.1 Web-based education interventions

Web-based education interventions provide mental health-related knowledge to individuals usually through self-help suggestions and resources for additional assistance and referrals. These types of websites for mental health services do not usually involve therapist interaction or treatment. According to Barak et al. (2009: 7), web-based education interventions are primarily designed, to provide university staff, the participants in this study with access to information about health and mental health. Naturally, web-based education intervention material is therapeutically inactive since the content's sole purpose is to increase and improve the consumer's information and comprehension of the subject matter of health and wellbeing (Barak et al. 2009: 7).

3.4.1.2 Self-guided web-based therapeutic interventions

Barak et al. (2009: 8) assert that web-based therapy aims to improve cognitive, behavioural, and emotional wellbeing. Unlike the former, this intervention includes content that is based on theory and is also supported by traditional face-to-face treatment and prevention programmes through the internet. The behavioural change content for this intervention is also active as it provides users with instructions and specific details in a comprehensive and structured format. However, this type of web-based intervention does not include a therapist and client interaction but is rather self-guided suggesting that users may struggle with motivation and adherence without the direct support of a therapist (Barak et al. 2009: 8). Additionally, there may be difficulties in correctly interpreting and applying the intervention content on their own.

3.4.2 Human-supported therapeutic web-based interventions

Human-supported therapy approaches, like the former, provide behaviour modification information aimed at promoting meaningful change. This intervention involves the assistance, direction, and feedback of a health professional or, in some circumstances, a peer helper.

3.4.2.1 Online therapy

Online therapy refers to the practice of maintaining contact and interaction between a client and a registered therapist that is typically conducted remotely through various ICT technologies (Rochlen, Zack & Speyer, 2004: 270). According to Cowpertwait and Clarke (2013: 248), the majority of online therapy utilises cognitive behavioural therapy (CBT), which is often conducted over several months or weeks. Moreover, it includes interactive sessions meant to prevent and manage depression, anxiety, and other mental health issues (Rochlen et al. 2004: 270). Thus, the main goal of online therapy is to assist individuals in resolving life and relationship issues. Online therapy usually involves a structured programme whereby users or clients' complete modules or exercises and receive feedback on their progress periodically (Cowpertwait & Clarke, 2013: 248). The therapist and client communicate using the internet's convenience, facilitating real-time and time-delayed conversation (Vally, 2006: 152). E-therapy is thus regarded for the present study as the provision of DMHS by a licensed professional through one or a combination of several digital health technologies. There are benefits of using online therapy including accessibility for people with limited physical limitations, convenience, and affordability since it can be accessed in remote areas. The internet generally makes mental health treatment more accessible (Baumel, 2015: 317).

3.4.2.2 Internet-operated therapeutic software

Internet-operated therapeutic software makes use of advanced computing capabilities that include artificial intelligence in three subgroups (Barak et al. 2009: 11). The first subgroup is that of robot simulation whereby a therapist interacts with a client or patient for therapy. The second type of internet-based therapy software employs artificial intelligence, which is used for evaluation, treatment selection, and progress tracking. The third type of internet-based therapeutic software is gaming and three-dimensional (3D) simulations, which primarily focus on solution-focused treatment for individuals suffering from anxiety, depression, behavioural issues, or social skills challenges. However, the application of internet-based therapy software is

expensive, time-consuming, and needs a high level of technical skills to design and operate successfully, which discourages mental health practitioners from utilising this type of e-health tool.

3.4.2.3 Other online activities

The fourth digital mental health service consists of other online activities which are also supported by the internet and various e-health tools. According to Barak et al. (2009: 12), online activities are generally suggested by the mental health practitioner as supplements to the primary treatment modality. These can either be an online intervention or a traditional face-to-face intervention. Examples of these online activities include online support groups, personal blogs, podcasts, social media platforms and online assessments among others.

Online support groups are made up of people who have mental health difficulties who gather online to engage and connect, either in real-time or at a later time via discussion groups (Abbott et al. 2008: 363). Furthermore, these online support groups often include a therapist whose primary function is to moderate and facilitate the correct usage of these group sessions. Lawlor and Kirakowski (2014:154) explain that online support groups are widely recognised as an appropriate form of mental health service delivery for individuals who have mental health problems. Emerging evidence has so far been substantiated by an increasing amount of both domestic and global mental health organisations that are incorporating these groups as an option to their online mental health services. Due to the general privacy and usage of asynchronous text communication, online support groups provide a one-of-a-kind atmosphere in which individuals can freely engage and converse (Lawlor & Kirakowski, 2014:154). Personal privacy and asynchronous text messaging have a good influence on mental health. For example, anonymity allows for self-disclosure by establishing a secure atmosphere in which individuals can express themselves without shame or negative consequences in their daily life (Frye & Dornisch, 2010: 1126).

Online mental health checks and evaluations are another online activity for digital mental health technologies. These activities relate to online websites that demand users to fill out questionnaires to gain information on their mental and physical health (Ybarra & Eaton, 2005:77). One of the advantages is that they allow users to indicate their mental health status.

Personal blogs and social media platforms also make up the list of other online activities for mental health services. Personal blogs and social media permit individuals to share content online, and in response, other members can offer feedback or communicate online via chat. Some of the

main benefits are that they require no technical expertise to operate, availability at all times, and their widespread popularity, given the millions active social media accounts globally (Naslund, Bondre, Torous & Aschbrenner, 2020: 253). To name a few, social media sites like Facebook, WhatsApp, Instagram, Twitter, and YouTube are rapidly evolving. Recent research shows there is a lot of interest among researchers and mental health practitioners in utilising social media for DMHS (Naslund, Aschbrenner, McHugo, Unützer, Marsch & Bartels, 2019:405; Välimäki, Athanasopoulou, Lahti & Adams, 2016:2). Social media platforms present individuals, mental health practitioners and organisations with an opportunity to share and discuss various mental health topics, promote new ideas and debate various mental health issues in a digital form using the internet (Naslund et al. 2019: 412). The impact of social media is that it directly involves users in their health and social media can be utilised to promote mental health since it quickly disseminates mental health information to a large population (Välimäki et al. 2016:2).

3.5 Digital mental health response during the COVID-19 pandemic at University X

Dr Zweli Mkize, the former minister of health, confirmed the first COVID-19 case in SA on 5 March 2020 (Department of Health, 2020:n.p). SA, like many other countries worldwide, responded by declaring a state of disaster and further introducing regulations for public health measures (Department of Co-operative Governance and Traditional Affairs, 2020:n.p). Some of the measures introduced in the country as explained above included lockdowns, isolations, wearing of face masks, washing of hands, and the use of sanitisers, quarantines, social distancing, and prohibition of mass gatherings. In response to the pandemic, many changes were experienced in all facets of life with SA HEIs pivoting to e-health tools as a crucial intervention. This section explores University X's DMHS initiatives as a case study of DMHS in response to COVID-19.

3.5.1 Higher Health and SA Depression and Anxiety Group

According to DHET (2022:24), the DHET appointed Higher Health, a national agency of the DHET, to coordinate with public universities and TVET colleges in combating mental health challenges during the pandemic. Upon receiving the mandate, Higher Health took the following actions: firstly, developing Post School Education and Training (PSET) guidelines on COVID-19, secondly driving the COVID-19 communication campaign in all SA HEIs and lastly conducting training and development capacity workshops on COVID-19. Higher Health engaged in a communication campaign, which was of particular interest to SA HEIs. Higher Health developed mental health resources in collaboration with WHO, the National Institute for Communicable

Diseases (NICD), and the Department of Health and further distributed them through to SA HEIs (DHET, 2022:24).

To address mental health issues in the SA HEIs, on 28 July 2020, Higher Health, in partnership with SADAG provided DMHS as an intervention to COVID-19. SADAG is largely considered Africa's largest non-profit mental health care and advocacy organisation (Kakuma et al. 2010:118). It is based in SA and focuses on capacity development, awareness programs, and counselling programmes. According to Lal (2019:58), mental health services are often provided by non-profit organisations, and it is no surprise that Higher Health partnered with SADAG. What is particularly notable about the Higher Health and SADAG partnership was its ability to quickly provide much-needed mental health services to university staff during a period of unprecedented crisis, free of charge. This collaboration, therefore, demonstrated how two organisations can come together to provide essential support for those in need during difficult times.

The provision of DMHS involved a customised three-tier programme to support university staff struggling with mental health, focusing on understanding the causes and effects of the pandemic and offering targeted assistance. In the first tier of the programme, university staff were introduced to initiatives aimed at promoting psychological resilience, recognising, and reducing anxiety, stress, depression and preventing suicide. The programme also included peer-to-peer counselling, mental health self-risk assessments, and a wide range of communication initiatives. Notably, the first tier of the programme encompassed interventions that sought to explore the causes and harmful psychological and physical impacts of gender-based violence, which is a prevalent concern in the PSET sector.

The second tier consisted of a 24-hour, toll-free helpline staffed by Higher Health, providing support in 12 official SA languages. The programme offered staff members on all university campuses free telephone and SMS counselling, crisis intervention and support, referrals to mental health professionals, and other psychosocial services. To ensure its success, Higher Health provided support for programme implementation and capacity building to SA HEIs.

At the third tier of the programme, Higher Health appointed 10 clinical psychologists, across all SA provinces. The psychologists provided counselling and referred cases to appropriate professionals for further mental health care.

3.5.2 Momentum Wellness

While conducting the study, the researcher, who was an employee at University X, became aware of the employee wellbeing services provided to University X by Momentum Wellness, a brand of Momentum Metropolitan Holdings Limited in 2022. The researcher managed to obtain a copy of the presentation from the Department of Human Capital of University X, which detailed employee wellbeing services offered by Momentum Wellness. The employee wellbeing services consisted of psycho-social counselling, medical support, trauma support, family care, legal advice, financial advice, debt restructuring, and on-site mobile medical clinics.

3.5.2.1 Psycho-social counselling

During her presentation to University X, Townsend (2022:4) explained that Momentum Wellness's psycho-social counselling was geared toward non-clinical assessment and referral. It was a short-term therapy support and psycho-education service. If a patient (university staff) requires long-term specialist intervention, the patient (university staff) would be referred to a medical aid or a public sector provider. 10 steps were provided to the university staff regarding management referral for psycho-social counselling services. These steps are outlined below.

1. "Identifying the problem.
2. Speaking to a case manager if the one need advice.
3. Discussing referral with employee and obtain consent.
4. Provision of non-emergencies contact will be made with the employee within 48-72 hours.
5. Emailing the completed form directly to the case manager only.
6. Completing a referral form found on the website or request one through webchat.
7. The manager will be informed when the counselling session is booked.
8. Employee receiving counselling.
9. Employee must first give consent to provide referring manager with feedback.
10. If the referring manager requires feedback regarding the employee, they will be emailed a closing report once the case is closed" (Townsend, 2022:4).

3.5.2.2 Medical support

Medical support through the 'Hello Doctor' application was also included in the employee wellbeing services provided by Momentum Wellness to University X (Townsend, 2022:4). 'Hello Doctor' is a mobile and web-based application designed to relieve the public health system of its

burden by eliminating long queues and reducing the high patient load at public clinics (Mbunge et al. 2022:5). It provides users instant access to registered doctors, anytime and from any location at no cost (Townsend, 2022:9). It also connects the patient to a doctor conveniently and cost-effectively and patients can request a call-back from the doctor. According to Mohd and Mustafah (2021:20) the 'Hello Doctor' application allows a patient to send questions via SMS and the conversations with the doctors are considered private and confidential. Moreover, Townsend (2022:9) asserts that upon a call-back request, a doctor will call back within an hour to provide medical guidance and support. The Hello Doctor service is available in all official SA languages (Townsend, 2022:9). However, the Hello Doctor service platform does not provide prescriptions or diagnoses rather it only focuses on medical guidance and support. The Hello Doctor service platform, therefore, serves as a platform to offer necessary guidance and advice from verified healthcare professionals, rather than providing medical prescriptions or diagnoses.

3.5.2.3 Trauma support

Trauma can severely impact employees' mental health (Ratangee, 2021:47). For instance, people who have experienced traumatic events have a higher risk of developing mental illnesses such as depression and PTSD (Rowell & Thomley, 2013:n.p). Momentum Wellness created a 24/7 trauma support line for University X staff, offering assistance with emotional challenges arising from COVID-19 and related events. By providing this support line, it appears Momentum Wellness helped alleviate the mental health burden of University X staff. This allowed them to manage the mental health consequences of traumatic events, such as COVID-19, more effectively. Thus, it is evident that Momentum Wellness had a positive impact on University X.

3.5.2.4 Family care

In Chapter Two, it was argued that university staff were forced to take on additional responsibilities at home, such as home-schooling their children, while grappling with the difficulties and anxieties caused by the pandemic. This, in turn, added greater strain to an already difficult situation. To assist university staff with family care responsibilities, Momentum Wellness offered support, including information and guidance on childcare, eldercare, education, social benefits, and disability (Townsend, 2022:10). Family care support also included helping staff locate local services like schools, hospitals, and doctors.

3.5.2.5 Legal advice

Legal advisory services were also part of the employee wellbeing services, with Momentum Wellness legal advisors guiding employees' current situations through the telephone (Townsend, 2022:11). However, they did not provide legal representation. Compared to medical and trauma services available 24 hours a day and seven days a week, legal advice was offered through a telephone call during office hours only: Monday to Friday, 08h00am-16h00pm.

3.5.2.6 Financial advice

Momentum Wellness also provided financial advice based on a university staff's present circumstances (Townsend, 2022:12). Despite their assistance, they did not provide any specific investment advice. Similar to the legal advice, the financial advice was telephonically available during office hours only: Monday to Friday, 08h00am-16h00pm.

3.5.2.7 Debt restructuring

Debt entrapment may be stressful and detrimental to one's mental health (Meltzer, Bebbington, Brugha, Jenkins, McManus & Dennis, 2011:777). In light of this, Momentum Wellness advised the university staff of University X that their service provider (Debt Rescue) was available to help with debt restructuring (Townsend, 2022:13). Debt Rescue evaluated individuals to determine if they qualified for restructuring and then took all required actions to halt debt collection. Debt restructuring services, in contrast to other employee wellbeing services that were offered for free, were provided for a fee as set out by the National Credit Regulator. However, the fee varied depending on the circumstances and the overall amount of debt.

3.5.2.8 On-site mobile medical clinics

Finally, Momentum Wellness through its primary health nursing sister provided medical support for the university staff (Townsend, 2022:14). With this service, Momentum Wellness further enhanced its commitment to the wellbeing of the university community. This provided an invaluable service, ensuring that staff members had access to timely and adequate health care. According to Townsend (2022:14), "the nurse focused on fundamental primary health screenings, such as temperature, blood pressure, HIV/AIDS testing, and the distribution of basic schedule one medication and where necessary, the nurse referred patients (university staff) for further medical care".

3.5.3 Other online mental health initiatives

Along with digital mental health and employee wellbeing services provided by Higher Health, SADAG and Momentum Wellness, University X also provided numerous online mental health initiatives including webinars, online workshops, and online resources. It appears from this that University X went above and beyond to ensure that the university staff had access to DMHS throughout the pandemic, enabling additional care and support. It is however imperative to note that several mental health webinars and online workshops were conducted by University X through Microsoft Teams. To this end, this section provides an overview of some of the mental health online webinars and workshops that University X offered to its employees.

One of the mental health webinars that was hosted by the Lifestyle and Wellness Department of University X was titled “Self-Management in the New Normal”. The webinar was conducted online on 26 August 2020 for 1 hour and 30 minutes. The webinar covered topics that included work-life balance, principles and motives, self-motivation, dreams and goals. The ultimate goal was to provide university staff with self-management abilities related to self-awareness, and self-regulation, and how this helps in adjusting to the new normal and finding balance.

Another noteworthy webinar was hosted on 3 December 2020 for 1 hour and 30 minutes. It was titled “Grief and bereavement during COVID-19”. The webinar focused on reducing and overcoming symptoms associated with grief and bereavement during the pandemic. Neimeyer, Klass and Dennis (2014:496) define grief as a response to the loss of something or someone that holds significance. As many lives were lost during COVID-19, it became essential to host the webinar for university staff.

As part of the aforementioned webinars, the Department of Student Counselling at University X also hosted a series of online webinars and workshops that were open to all university students and staff. For instance, they hosted a webinar on 16 September 2020 titled “Mental illness and COVID-19 Pandemic”. In addition, they hosted another workshop on 17 September 2020 titled “Overcoming COVID-19: Power-Up, Positive Thinking and Mind-Set”. The webinars and online workshops discussed relevant topics regarding the impact of COVID-19 on mental health and the challenges that staff and students were facing at the time. They also focused on coping strategies and methods for maintaining a positive mental outlook when dealing with the daily challenges of maintaining a healthy life balance during this time. A key component of the webinars and online workshops was to identify potential stressors and create realistic solutions to reduce their impact.

By attending the webinars and online workshops, participants had the opportunity to become more informed and knowledgeable about University X's mental health initiatives and how to use them to their benefit. This is consistent with a recent study which revealed that during COVID-19, online webinars were utilised to explore ways to help people manage their mental health during the pandemic and adapt to ever-changing circumstances (Labrague, 2021:1903).

Given the above-explained DMHS responses during the COVID-19 at University X, the study contends that the previous three years (2020 – 2022) have been noteworthy. Even though it is unclear how many university staff members utilised these services, what remains evident is that during the pandemic, University X was able to develop and launch various DMHS in conjunction with Higher Health and SADAG. This helped university staff cope with the stress and anxiety associated with the pandemic. Moreover, University X was able to partner with Momentum Wellness to provide employee wellbeing services, demonstrating a further commitment to the mental health of its staff. Additionally, the university also launched a series of online workshops and further provided online resources to help staff learn more about coping strategies and stress management techniques.

3.6 E-health tools and user experiences gained during the COVID-19 pandemic

The study in Chapter One proposed that university staff's COVID-19 experiences could significantly impact the long-term use of e-health tools in DMHS. Although the actual user experiences gained at University X are not yet known, it is important to draw lessons from other studies in which e-health tools were used to deliver DMHS. Such findings, conclusions, and recommendations from other research studies can be used as a benchmark to understand potential user experiences at University X. The information can also be used to devise effective strategies for introducing e-health tools at University X to ensure the best possible user experience sustainably.

COVID-19 has been linked with increased psychological distress, highlighting the necessity for SA universities to embrace e-health tools for DMHS because of remote teaching, multimodal teaching and learning policies. However, considering that the future of public health is anticipated to be digital, there is a concern about what the future holds for DMHS in the post-COVID-19 workplace setting (Fagherazzi et al. 2020:6; Rudd & Beidas, 2020:2; Bierbooms, van Haaren, IJsselsteijn, de Kort, Feijt & Bongers, 2020:2). This necessitates a comprehensive understanding of how the experiences learned during the COVID-19 pandemic could impact the sustainable

adoption of e-health tools in the delivery of DMHS. Accordingly, this elevated the need to investigate whether a positive relationship exists between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.

The landscape of DMHS has changed as a result of COVID-19 (Mbunge, Muchemwa & Batani, 2022:6). In contrast to the hesitation and scepticism that was evident before the pandemic, literature analysis indicates that COVID-19 significantly increased the incorporation of e-health tools in the provision of DMHS (Reingold, Hadjipanayis, van Esso, Del Torso, Dornbusch, de Guchtenaere, Pancheva, Mujkic, Syridou, Valiulis & Mazur, 2021:6). This suggests that, even with the challenges of the pandemic, the mental health care providers were rapidly embracing e-health tools to provide better mental health care. Moreover, the transformation reflects the potential of digital interventions to bridge the gap between the need and access to mental health care.

A study by Murphy, Scott, Salisbury, Turner, Scott, Denholm, Lewis, Iyer, Macleod and Horwood (2021:169) found that the utilisation of DMHS as an alternative for in-person consultations accelerated during COVID-19. This reflects that e-health tools are becoming more widely accepted for mental health care, even in times of crisis. In this regard, several authors predict that the increasing comfort with DMHS will drive the continued growth of this trend (Fagherazzi et al. 2020:6; Rudd & Beidas, 2020:2; Bierbooms et al. 2020:2). As a result, it is essential to leverage digital technologies to address mental health needs in the post-COVID-19 pandemic. This view is supported by Ellis, Meulenbroeks, Churruca, Pomare, Hatem, Harrison, Zurynski and Braithwaite (2021:12). The researchers believe that e-health tools will remain a vital part of DMHS in the digital age based on their demonstrated cost-effectiveness and efficacy.

In their study, Wang, Sun, Liu and Lai (2022:224) revealed that users were largely satisfied with the health care services provided through e-health tools. The researchers found several factors that contributed to user satisfaction, including convenient procedures, excellent service attitudes, professionalism, and reasonable fees. Therefore, user satisfaction can be regarded as indicative of the efficacy of e-health tools in delivering quality DMHS. In light of this, user satisfaction can serve as a significant indication to evaluate how well e-health tools work in delivering high-quality digital mental health care.

Modern smartphones, as was already discussed, have a broad range of useful features, and may connect to mental health care applications. In this regard, Sinha, Meheli, and Kadaba (2023:7)

analysed real-life data to determine the relationship between mental health needs, the COVID-19 pandemic, and whether artificial intelligence-led interventions (Wysa) are effective and acceptable. Their study reported that emotional distress increased significantly during the pandemic, leading to greater utilisation of an artificial intelligence-driven mental health application (Wysa). The Wysa application was also shown to reduce anxiety and depression symptoms significantly when utilised by users. Research showed the value of contextualising interventions and provided evidence that digital health initiatives can improve the delivery of evidence-based mental health care to large populations. Considering these latest research findings, it is pertinent to note that e-health tools through smartphone applications have the potential to revolutionise mental health services on a large scale and further underscore the need for more artificial intelligence-driven mental health applications for crisis support.

As highlighted by Ngcobo-Sithole and Mabusela (2022:257), a key lesson from COVID-19 is the need for all healthcare services to have standard protocols and systems for remote interventions. For SA HEIs, such protocols and systems could help guarantee that university staff receive the necessary DMHS promptly in the event of a future crisis. However, Ngcobo-Sithole and Mabusela (2022:257) argue that it will take significant investments and commitments from governments and other key stakeholders to ensure that people in remote areas and the most vulnerable receive DMHS through e-health tools.

In developed countries, e-health tools in the form of telemedicine have seen significant success, particularly in Europe and America, where there has been significant growth and development during the COVID-19 pandemic. This is despite the fact that there are still facing challenges towards sustainable adoption (Mbunge et al. 2022:7). The success of e-health tools can be attributed to the convenience, cost-effectiveness, and accessibility they provide to patients, as well as the increased efficiency and accuracy of diagnosis and treatment (Tebeje & Klein, 2021:153). Thus, SA HEIs can benefit from the experiences of developed countries in adopting e-health tools sustainably.

Despite the benefits, there were notable challenges associated with using e-health tools during the pandemic, including ethical concerns like privacy and data protection (Ngcobo-Sithole & Mabusela, 2022:258). As the utilisation of e-health tools has grown during the pandemic, so too have concerns about patient data security and the risks associated with its misuse. For instance, a recent study conducted by Ngcobo-Sithole and Mabusela (2022:258) reported that patient information was of concern during COVID-19 over the use of e-health tools as users feared that

their data may be compromised, which may impact patient-provider trust. There are studies that have demonstrated that e-health users were concerned about their personal information and medical records being shared with third parties (Tagde, Tagde, Bhattacharya, Tagde, Chopra, Akter, Kaushik, & Rahman, 2021: 52811). In line with this finding, Bassan (2020:10) also reported that users were concerned about the risk of their data being used for purposes other than the ones it was originally intended for, such as marketing. Apart from these ethical concerns, Naidoo, Bottomley, Naidoo, Donnelly and Thaldar (2022:13) argued that SA currently lacks specific laws that deal with artificial intelligence in health care. This means that there are no specific legal frameworks to help guide policymakers and other stakeholders on the ethical implications of using artificial intelligence in health care including DMHS. For University X, the lack of legislation leaves them vulnerable to potential misuse of artificial intelligence in the provision of DMHS, as well as legal repercussions for those who may be affected. Notwithstanding this, Naidoo et al. (2022:15) recommend that the SA government should establish a national policy framework to guarantee the ethical, responsible, and controlled development and use of artificial intelligence in healthcare. Consequently, for University X, the main lesson here is that all these ethical issues and the lack of artificial intelligence legislation can hamper the sustainable adoption of e-health tools for the delivery of DMHS. Thus, it is vital for University X to ensure that all ethical considerations and regulations are adhered to when sustainably adopting e-health tools for DMHS.

3.7 Summary

This chapter reviewed literature relating to the concept of e-health tools and DMHS. It established that e-health encompasses various ICT-based tools used to support and care for patients' mental health. The review also highlighted that e-health tools perform different functions which include but are not limited to communication, mental health information sharing, online mental health promotion, mental health literacy, information storage, and access, clinical decision support, patient and/or population monitoring, internet-delivered cognitive behavioural therapy, diagnosis, prevention and treatment of patients (Gooding, 2019:3; Asi & Williams 2018:116; Schueller et al. 2016: 145). The literature review also highlighted that the utilisation of e-health tools is heavily reliant on internet connectivity and computers to function effectively, and they can be linked to a broader spectrum of ICT tools.

The literature review highlighted various forms of e-health tools that help to deliver DMHS. These include m-health, telehealth also known as telemedicine as well as social media applications. In addition, some of the 4IR technologies that contribute to the delivery of DMHS were also

discussed. These included artificial intelligence, machine learning, virtual reality, Internet of Things and cloud computing. The broad discussion of e-health forms and 4IR technologies provided valuable insight into how mental health services are accessed and used effectively, enhancing an understanding of their respective strengths and weaknesses.

Due to the lack of standardised terminology used to describe many types of DMHS delivered via the internet and e-health technologies, the study relied on Barak et al. (2009:5–14) to guide the discussion of different DMHS types which consist of four categorised types of DMHS including web-based interventions, online counselling and therapy, internet-operated therapeutic software and other online activities.

The chapter then shifted to discuss DMHS responses at University X during the COVID-19. With SADAG as a key partner, Higher Health led a comprehensive PSET response to COVID-19 as the national agency of DHET dedicated to staff wellbeing. The intervention addressed the mental health needs of university employees across all SA HEIs. Furthermore, Momentum Wellness, a brand of Momentum Metropolitan Holdings Limited, also provided employee wellbeing services to University X in 2022. The employee wellbeing services consisted of psycho-social counselling, medical support, trauma support, family care, legal advice, financial advice, debt restructuring, and on-site mobile medical clinics. Along with digital mental health and employee wellbeing services provided by Higher Health, SADAG and Momentum Wellness, University X also provided numerous online mental health initiatives including webinars, online workshops, and online resources. From this, it appears that University X went above and beyond to ensure that the university staff had access to DMHS throughout the pandemic, enabling additional care and support during an unprecedented time.

This chapter concluded by discussing e-health tools and user experiences gained during the COVID-19 pandemic using other recent studies, as University X's actual user experiences are still unknown. Some of the user experiences from the literature include, among others, the significant increase in the use of e-health tools, increased patient satisfaction, increased utilisation of artificial intelligence-driven mental health applications, the need for standard protocols and systems capable of handling a wide range of remote interventions as well as heightened ethical concerns about e-health tools (Reingold et al. 2021:6; Wang et al. 2022:224; Sinha et al. 2023:7; Ngcobo-Sithole & Mabusela, 2022:257). The following chapter continues to review the literature and discusses sustainability and e-health tools adoption strategies.

CHAPTER FOUR

THE CONCEPT OF SUSTAINABILITY AND STRATEGIES FOR THE SUSTAINABLE ADOPTION OF E-HEALTH TOOLS

4.1 Introduction

This chapter explores the notion of sustainability and strategies for implementing e-health tools in a sustainable manner. It commences with an explanation of sustainability and its application to the adoption of e-health tools for DMHS. Subsequently, the chapter discusses the benefits of the sustainable adoption of e-health tools, followed by an overview of the challenges involved. The challenges are explained under the economic, social, environmental, and technical pillars of sustainability. To address the challenges, the study theoretically proposes strategies aligned with these four pillars of sustainability to promote and facilitate the sustainable adoption of e-health tools DMHS in SA HEIs.

4.2 The concept of sustainability and adoption of e-health tools

Sustainability, commonly known as sustainable development in the literature, is widely recognised as one of the most important issues of the 21st century and tackling the difficulties that underpin the concept is critical (Moore, Mascarenhas, Bain & Straus, 2017:1). Thus, understanding the concept of sustainability and adoption of e-health tools raises important questions about what it is, why, and how best to manage and improve sustainable adoption of e-health tools in delivering DMHS. A literature exploration on search engines shows the term sustainability is a catchphrase or catchword for academic papers as well as themes of academic conferences (Mensah, 2019:2). Perhaps, this suggests the term sustainability is a contemporary and top buzzword. However, this is not surprising because more than a decade ago, Scoones (2007:589) noted that almost everything nowadays is described as ‘sustainable’, for instance, there are sustainable economies, cities, businesses, resource management, livelihoods, and of course, in this study sustainable adoption of e-health tools in delivering DMHS.

It is worth noting that, HEIs have long been regarded as influential actors and change agents in society (Hyytinen, Laakso, Pietikäinen, Ratvio, Ruippo, Tuononen & Vainio 2023:119). In recent years, researchers such as Mpofu, Mpofu, Mantula and Shava (2024:475) argued that HEIs are influential actors and change agents in advancing sustainability efforts of the UN SDGs, particularly SDG 3: Good health and well-being, which aims to “ensure healthy lives and promote

well-being for all at all ages". To this end, Zhou, Rudhumbu, Shumba and Olumide (2020:89) posit that HEIs typically fulfil this role through multifaceted approaches encompassing research, education, public engagements, and governance and operations. This perspective suggests that HEIs have the potential to be drivers of change through research endeavours, academic discourse, and public engagement initiatives to help achieve SDG 3. Furthermore, HEIs can provide institutional support through their governance and operations to ensure that sustainability efforts are effectively implemented which would then contribute to the development of innovative solutions for promoting health and wellbeing.

The term "sustainability" as a policy concept originated from the Brundtland Report of 1987 (World Commission on Environment & Development, 1987). Kuhlman and Farrington (2010:3437) postulate that sustainability has become an expression of what public policies are ought to achieve. Furthermore, the same authors argue that over the years, the concept has shifted its meaning and to this end, defining sustainability in the context of the adoption of e-health tools in delivering DMHS has been elusive. Moore et al. (2017:1) maintain that there is a lack of a consistent definition of sustainability in the literature. This emanates from the fact that literature on sustainability is to a larger extent more theoretical and provides little guidance on how to sustain the adoption of e-health tools in delivering DMHS (Stirman, Kimberly, Cook, Calloway, Castro & Charns, 2012:10; Tricco, Ashoor, Cardoso, MacDonald, Cogo, Kastner, Perrier, McKibbon, Grimshaw & Straus, 2015:8). Moreover, sustainability is often measured from different levels; for example, local or global however in this study, the focus is on the former. Local sustainability is therefore the focal point of this study, providing a unique perspective on the subject but it is imperative to acknowledge the existence of global sustainability as well.

Due to the lack of standardised terminology used to define "sustainability", the study considers diverse definitions of sustainability to draw more insights into the concept. According to the World Commission on Environment and Development (1987), sustainability refers to the process of meeting the needs of the present without compromising the ability of future generations to meet their own needs. Although useful, this definition has been widely criticised in the literature. This stems from the fact that the definition provides no details regarding the nature of a sustainable society and how individuals should behave to achieve sustainability. According to Chambers, Glasgow and Stange (2013:2), sustainability refers to a continuous adaptation process that allows an intervention to fit within a changing context. Scheirer and Dearing (2011:2060) goes further and state that sustainability is an evidence-based outcome of an implementation process that allows the users to continue to benefit from an intervention. Kuhlman and Farrington (2010:3441)

add that sustainability is the process of maintaining well-being over a long period. Moore et al. (2017:1) conclude by stating that the definition of sustainability includes five constructs, and these include a defined period, clinical intervention to be delivered, individual behaviour change, the programme, and the programme that must continue to produce benefits for individuals.

The term ‘sustainability’ lacks a universal definition, as many scholars vary in their inclusion of certain aspects, leading to differing interpretations across the literature. For this research, sustainable adoption of e-health tools refers to the university capacity to provide ongoing DMHS that benefits university staff over a long period through e-health tools, and the ability to address future mental health needs.

Sustainability is commonly linked with ecological effectiveness, and it relies on three pillars which are economic, social, and environmental (Mensah, 2019:9). However, as Figure 4.1 below depicts, researchers are embracing a fourth pillar of sustainability, the technology pillar (Fanta & Pretorius, 2018:135). The argument is that technology is often entrenched in the sub-systems that comprise the economy, society and environment (Musango & Brent, 2011:88). Even though technology is continuously evolving, its role is to promote equitable, affordable, and universal access to health services such as DMHS (WHO, 2021:4).

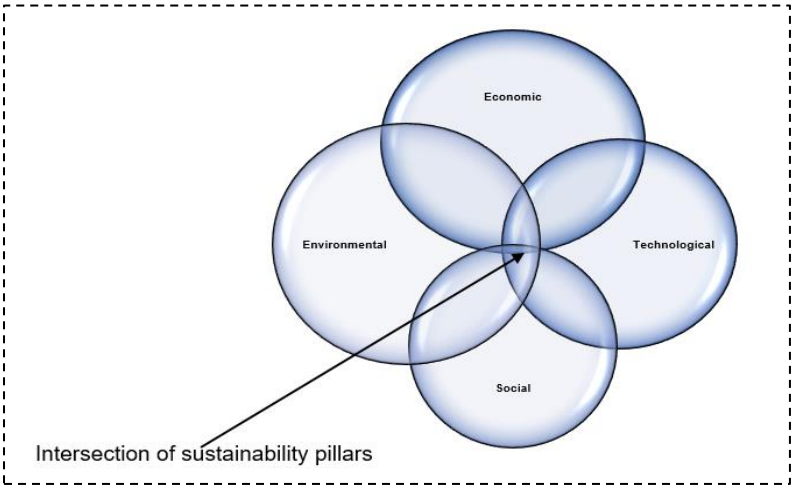


Figure 4.1: Intersection of sustainability pillars

Source: Fanta and Pretorius (2018:135)

Economic sustainability is an integral part of sustainability and in resource-constrained countries such as SA, it is critical to the long-term viability of e-health tools (Fanta & Pretorius, 2018:136).

It is primarily concerned with maintaining economic development to meet current demand levels without jeopardising future needs (Mensah, 2019:9).

Gidigbi (2021:28) defines social sustainability as the ability of a social system to maintain a specified level of social wellbeing. It is concerned with the notions of accessibility, equity, empowerment, institutional stability, and participation (Mensah, 2019:9). As an essential pillar of sustainability, social sustainability aims to fulfil social objectives such as social cohesion and equitable access to vital services like mental health support (Sharifi & Simangan, 2021:9). In the context of e-health tools, social sustainability is reflected in how individuals interact within and outside the organisation. Furthermore, Fanta and Pretorius (2018:136) argue that if end-users inside the organisation (HEIs) embrace the technology, the adoption of e-health tools can be long-term sustainable.

Mensah (2019:10) affirm that environmental sustainability focuses on preserving the natural environment and its ability to sustain human life and activities. Furthermore, environmental sustainability addresses a variety of issues, one of which is resource efficiency (Sharifi & Simangan, 2021:13). The idea is to manage resources in the best way possible leading to the commitment to protect and conserve ecosystems now and in the future. Guerriero, Haines and Pagano (2020:494) postulate that environmental sustainability must be viewed as a structural requirement for promoting health. In the modern era, it is critical to put health and sustainability at the centre of the economy by implementing post-COVID-19 policies that aid in the achievement of a variety of goals, including health and environmental sustainability (Guerriero et al. 2020:494). The SA HEIs, where ICTs are utilised for DMHS in various workplace settings, constitute the natural environment in this study. In the context of e-health tools, Fanta and Pretorius (2018:136) maintain that it is illogical to exclude environmental sustainability from the implementation of sustainability for e-health tools because the system for e-health tools is adopted and used within organisations (environment).

It is also imperative to comprehend that sustainability attempts to accomplish a system's social benefits, economic development, and environmental quality all at the same time (Fanta & Pretorius, 2018:134). In delivering DMHS, the long-term sustainability of e-health tools thus depends on the interconnection or interplay between economic, social, environmental and technological pillars of sustainability (Fanta & Pretorius, 2018:135; Hay, Duffy & Whitfield, 2014:233; Musango & Brent, 2011:86).

4.3 Benefits of the sustainable adoption of e-health tools

Literature shows that the sustainable adoption of e-health tools for DMHS has many benefits to the end-users, providers and healthcare practitioners. Before discussing these benefits, it is worth emphasising that several scholars propose that it is more suitable to use the term 'opportunities' instead of benefits or advantages (Moock, 2014:2; Vally, 2006: 156). The argument is that e-health tools provide opportunities to improve one's mental health repertory as well as prospects to enhance the approach itself. However, further analysis reveals that both terms have largely the same meaning but are used interchangeably in the literature.

As university staff in SA HEIs continue to confront increasing mental health issues that hinder their work efficiency, so does the demand for increased mental health care. Thus, e-health tools can help SA HEIs manage mental health challenges. The usefulness and role of e-health tools is that they enhance the provision of services by improving access to digital mental health care in remote areas (Titov, Hadjistavropoulos, Nielssen, Mohr, Andersson & Dear, 2019:1). Improving and expanding access to DMHS through e-health tools is vital. Mental health issues are widespread in the SA population including university staff. This is because people who suffer or encounter mental health problems usually do not receive proper care or treatment (Bruwer, Sorsdahl, Harrison, Stein, Williams & Seedat, 2011:774; Kinman & Johnson, 2019:159; Gie et al. 2017:11; Barkhuizen et al. 2014:9; Bezuidenhout & Cilliers, 2010:1). Utilising e-health tools expand access to a vast of mental health information through online programmes (Balcombe & De Leo, 2021:5).

E-health tools also provide benefits to the users including availability, cost-effectiveness, and convenience (Gainsbury & Blaszczynski, 2011:491). The cost of mental health care can be effectively reduced by using e-health tools, which increase efficiency and decrease in-person consultations or visits. For example, the recent pandemic has demonstrated the availability, cost-effectiveness and convenience of e-health tools in sustaining the delivery of DMHS while eliminating the danger of viral transmission in the setting of an outbreak. Kane, Baumgart, El-Hage, Deloyer, Maes, Lebas, Marazziti, Thome, Fond-Harmant and Denis (2022:2) explain that during the COVID-19 pandemic, e-health tools enabled remote monitoring and treatment of patients, and these technologies were employed in a variety of strategies to limit the danger of viral transmission while providing vital DMHS. Thus, mental health care providers and patients were able to communicate remotely, saving time and improving accessibility.

Using e-health tools can improve mental health care coordination for patients, leading to better outcomes. The utilisation of e-health tools in the form of telehealth can also benefit university staff by enabling effective communication through various forms of remote communication (WHO, 2012:78). According to Aungst and Patel (2020:2), the utilisation of telehealth allows for the delivery of DMHS for self-care which in turn supports the mental health diagnosis, monitoring, and treatment of patients remotely (Asi & Williams, 2018:116). E-health tools may assist patients in efficiently managing their mental health care, which will result in better outcomes. In addition, e-health tools also disseminate mental health information and aid in communication (Moock, 2014:2). Blair and Abdullah (2018:4) revealed in their study that e-health technologies can enable people to access social media platforms that have a good influence on users' mental health, enabling them to obtain social support despite geographic distances.

E-health tools, through interactive media and personalised methods, promote continuity of digital mental health care and service engagement (Lal, 2019:57). This is significant, considering the high rates of disengagement associated with traditional face to face mental health services (O'Brien, Fahmy & Singh, 2009:565). Moreover, e-health tools also enable digital mental health interventions for people who prefer to seek help anonymously for fear of stigmatisation (Lal, 2019:57). Besides, this is also useful for individuals seeking help regarding their mental health problems but may be hesitant to use traditional face to face services (Gainsbury & Blaszczynski, 2011:491).

Several scholars have concluded that e-health tools that provide DMHS are effective and hold great potential (Andrews, Cuijpers, Craske, McEvoy & Titov, 2010:4; Gainsbury & Blaszczynski, 2011:495). Also, three meta-analyses have concluded that DMHS for a range of mental health conditions are equally effective as traditional face-to-face services (Lehtimaki, Martic, Wahl, Foster & Schwalbe, 2021:16; Garrido, Millington, Cheers, Boydell, Schubert, Meade & Nguyen, 2019:15; Gainsbury & Blaszczynski, 2011:497). Thus, demonstrating efficacy across various mental health issues and holding substantial potential is significant. It helps in the establishment of scientific evidence that helps to make informed decisions for a wide variety of key stakeholders. Table 4.1 below summarises the benefits of the sustainable adoption of e-health tools for DMHS.

Table 4.1: Summary of benefits to the sustainable adoption of e-health tools

Benefit	Explanation
Access	Users can access DMHS and vast amounts of information in remote areas via computers, laptops, tablets, mobile devices and other devices (Titov et al. 2019:1).
Convenience	Users can access mental health services anywhere at any time, saving time and money (Gainsbury & Blaszczynski, 2011:491).
Cost savings	Utilising e-health tools can reduce mental health care costs by increasing efficiency and reducing in-person visits, especially during a crisis like COVID-19 (Kane et al. 2022:2).
Improved patient outcomes	With e-health tools, users can make better-informed decisions regarding their health (Norris et al. 2013:381-385).
Data management	E-health tools eliminate the need for a physical place to store and manage data, improving the efficiency and accuracy of mental health care records (Kuo, 2011:10).
Improved communication	E-health tools improve patient-provider communication and allow for the dissemination of current and up-to-date mental health care information (Gomes de Melo e Castro e Melo and Araújo, 2020:328; Moock, 2014:2).
Anonymity	E-health tools enable digital mental health interventions for people who prefer to seek help anonymously for fear of stigmatisation (Lal, 2019:57).
Promote continuity	E-health tools, through interactive media and personalised methods, promote the continuity of digital mental health care and service engagement (Lal, 2019:57).
Social support	Through social media platforms, e-health tools can impact people's mental health, enabling them to obtain social support despite geographical distances (Blair & Abdullah, 2018:4).
Awareness, connections and dissemination	Social media platforms are useful for connecting people, raising awareness, and providing information on mental health issues (Saud et al. 2020:8).
Effectiveness	DMHS have potential and is equally effective as traditional face-to-face services (Lehtimaki, et al. 2021:16; Garrido, et al. 2019:15; Gainsbury & Blaszczynski, 2011:497).

Source: Author's own creation based on the literature review

4.4 Challenges to the sustainable adoption of e-health tools

Despite the benefits, there are challenges to the sustainable adoption of e-health tools for DMHS. In the same way that benefits are better perceived as opportunities, barriers to the sustainable adoption of e-health tools for DMHS should also be regarded as challenges (Vally, 2006: 156). This indicates that, while e-health technologies provide exciting prospects for DMHS, they come with a set of challenges, that require solutions and strategies to sustainably adopt them. The challenges are discussed below in terms of the economic, social, environmental, and technological pillars of sustainability.

4.4.1 Challenges to the economic sustainability of e-health tools

As explained in Chapter Three, e-health tools rely heavily on internet access and computers to work efficiently and they can be linked to a broader range of ICT tools such as mobile devices, tablets, smartphones, and mobile software applications (Mwangama et al. 2020:7; Fairburn & Patel, 2017:19). However, in Africa, the accessibility, quality and cost of internet and ICT tools remain expensive and out of reach for many people. This indicates that DMHS are not always accessible to some patients due to the lack of e-health tools and internet costs resulting in inequities in access to mental health care. A recent survey revealed that internet, data services and products are still out of reach to over half of the SA population (Gillwald, Mothobi & Rademan, 2018:97). This means the internet is highly priced for many people in SA. In SA HEIs, the problem of internet access seems to remain an area of primary concern due to the adoption of multimodal teaching and learning policies. As a result, it has been reported that university staff in SA HEIs have been discouraged from effectively utilising internet services due to the limited access and poor internet connection speeds (Maphalala & Adigun, 2021:2). This is however not surprising given that previous scholars reported that in SA HEIs, there is a lack of bandwidth management skills and poor internet policies that impact the effective utilisation of internet (Njenga, 2011:39). In addition to these challenges, Grzybowski (2022) affirm that smartphones, which are part of e-health tools remain expensive and unaffordable to the majority of population in low-income countries including SA. Although challenges exist, reports indicate that smartphones will represent 88% of total internet connections in Sub-Saharan Africa by 2030, with SA accounting for 94% compared to the global average of 92% (Global System for Mobile Communications Association, 2023:15). These reports suggest, smartphone users will increase substantially in the near future, potentially including university staff partly due to increasing affordability (Global System for Mobile Communications Association, 2023:15).

Limited funding is another challenge to the sustainable adoption of e-health tools in SA, impacting DMHS. Temesgen (2019:37) asserts that funding limits internet access, as well as the availability of cutting-edge infrastructure and access to smartphones and tablets capable of supporting health applications. Research conducted by Lewis, Synowiec, Lagomarsino and Schweitzer (2012:332) reported that in low and middle-income countries such as SA, there are several programmes to expand e-health services. Unfortunately, these programmes are often impeded by their continued reliance on donor funding, which highlights the significance of eventually transitioning to alternate and diverse sources of funding. Hence the more the availability of sustainable sources of funding, the better the increased sustainable adoption rates of e-health tools (Fanta & Pretorius, 2018:141).

Most of the e-health initiatives are funded by non-profit organisations (NPOs) and multinational organisations which implies their operations are for non-financial objectives to generate a social benefit of mental health care (Lal, 2019:58). However, as explained in a research study by Choto (2019:3), socioeconomic disparities and the low quality of life in emerging nations like SA have increased the demand for social support. The author further elucidates that due to the influx of new competitors in the NPO sector, there is now fierce rivalry for donor funding. Notably, the 2008 global economic crisis had a detrimental effect on philanthropic endeavours, which resulted in a shrinkage and unpredictability in donor contributions (Christine, 2011:111). In light of the fierce rivalry for donations, it seems that NPOs are operating in an unfavourable environment. Since 2004, SA NPOs were already experiencing uncertainty regarding donor funding (Netswera, 2004:31). According to Kyalimpa (2017:22), the funding of most NPOs in sub-Saharan Africa is highly dependent on one external source. Nhaitayi (2014:2) reports that some NPOs have shut down while others have reduced their activities because of serious financial and capacity issues. Since NPOs fund most e-health initiatives, which has a detrimental impact on the delivery of DMHS in SA HEIs. As explained above, some NPOs are experiencing a reduction in donor funding, and some have even shut down or scaled back their operations, creating a high level of unpredictability of DMHS in SA HEIs.

4.4.2 Challenges to the social sustainability of e-health tools

Sharifi and Simangan (2021:9) explain that the user's views regarding the usefulness of e-health tools, their attitudes, problem-solving abilities, competency, and trust in using the e-health tools have a direct impact on the adoption and effectiveness of e-health tools. However, end-users' skills in utilising e-health tools in developing countries such as SA are lower compared to those

in developed countries which makes it challenging to sustainably adopt e-health tools for DMHS (Ahmad, 2014: 1288).

Berkman, Davis and McCormack (2010:12) contend that the sustainable adoption of e-health tools requires users (university staff) to have digital health literacy for effective health decision-making. Literature shows that poor health literacy contributes to the challenges of sustainable adoption of e-health tools by making it difficult to understand and follow health instructions. This leads to ineffective self-management of health issues and insufficient utilisation of preventative measures (Stormacq, Van den Broucke & Wosinski, 2019:249). A study conducted by Bantom, De La Harpe and Ruxwana (2016:6) found that in certain rural areas of SA, some patients struggle with reading and interpreting medical records. As a result, this can have serious consequences for the patients' health including delayed or missed diagnoses which may hinder timely interventions and put their lives at risk. Despite the lack of clarity in the literature regarding digital health literacy in SA urban areas, another study conducted by Posiliti and Cilliers (2019:269) found that SAs have limited digital health literacy skills that enable them to seek health information. Consequently, the study concluded that the lack of digital health literacy skills adversely impacts the successful implementation of e-health initiatives.

While SA has 12 official languages, e-health tools are however mostly available in major global languages like English, German, French and Spanish and therefore excludes other SA languages apart from English (Norris et al. 2013: 385). This suggests that people who only speak other SA languages may be unable to utilise e-health tools for DMHS, simply because they do not understand or are not proficient in the language used by these e-health tools. Further to this pertinent issue, James and Versteeg (2007:121) express concern about the number of SA therapists who are not proficient in other SA languages apart from English. The authors recommend that translation services be made available so that more SAs can be reached. A study by Mbunge et al. (2022:9) revealed that language barriers and a lack of understanding significantly hindered the effective utilisation of e-health tools in SA during the recent pandemic. Other studies further report that a lack of translation of digital health technologies into local languages causes low health literacy in SA (Chigona, Mavela, Mulaji, Mutetwa, Moyanga & Ndoro, 2021:21). In line with these findings, Grobbelaar and Uriona-Maldonado (2019:849) postulate that there is a lack of awareness of e-health tools for DMHS in SA HEIs. Holst, Sukums, Radovanovic, Ngowi, Noll and Winkler (2020:160) conclude that language barriers have an impact on the effective utilisation of e-health tools. In this context, they suggest that e-health tools such as m-health are underutilised and require more strategies for their sustainable adoption.

Misinformation and conspiracy theories pose challenges when using social media to deliver DMHS. During the recent pandemic, it was noted that social media was used to spread false information. This included conspiracy theories concerning COVID-19 vaccinations, and efforts to undermine the importance of preventative and control measures such as social distancing and wearing of masks (Mbunge et al. 2022: 9). In this regard, the sustainable adoption of e-health tools could be impacted by misinformation and conspiracy theories given the increasing popularity of social media.

Patient characteristics are important when it comes to the use of e-health tools for DMHS. Brenes, However, Ingram and Danhauer (2011:8) point out that using e-health tools to deliver DMHS may not be appropriate for all patients and various mental health issues. The authors argue that e-health tools are at times inappropriate, particularly in the case of serious mental disorders. Such patients would benefit more from face-to-face psychotherapy or a combination of face-to-face psychotherapy and telephone interventions.

4.4.3 Challenges to the environmental sustainability of e-health tools

Lack of management support hinders the sustainable adoption of e-health tools for DMHS. According to Johnson and Diman (2017:13), a company's top management has a direct impact on how financial resources are acquired and allocated. Al-Mamary, Shamsuddin and Aziati (2014:123) corroborate by stating the importance of senior management support for e-health adoption, including encouragement, understanding, and a focus on user satisfaction. Therefore, the absence of top management support will significantly jeopardise the sustainable adoption of e-health tools. According to research conducted by Ramdani, Duan and Berrou (2020:12), government policy has a detrimental effect on the adoption of innovative technologies. This implies that limited government support for e-health initiatives can be a significant challenge, as laws and regulations can impact technology adoption.

The effective delivery of DMHS requires various resources such as financial, human resources, ICT infrastructure and electricity to ensure the sustainable adoption of e-health tools (Fanta & Pretorius, 2018:136). According to Hiran and Henten (2020:445), financial resources are major barriers to the adoption of health-related technologies in low-income countries like SA. The lack of adequate funding to build, maintain, and administer online platforms and telecommunications expenses has been identified as a major obstacle to the sustainable utilisation of e-health tools (Fagherazzi et al. 2020:6). In terms of human resources, large organisations' adoption processes

are influenced by ICT expertise, while small enterprises are less likely to adopt new technologies if they have little or no ICT expertise (Walker & Brown, 2019:6). Moreover, the utilisation of e-health tools for mental health requires ICT infrastructure. However, a study carried out by Furusa and Coleman (2018:4) found that there is a lack of ICT infrastructure in developing nations. The authors further recommended the need for strategies that should help promote the sustainable adoption of e-health tools.

Nowadays, modern life is almost impossible without electricity, which is also vital for e-health tools for DMHS. Electricity powers e-health tools, internet connections, and other ICTs required for DMHS. Without a stable electricity supply, DMHS would be difficult to provide, hindering access to support for university staff. Unfortunately, Eskom, SA's biggest and main energy company, has recently been unable to meet the nation's rising energy demands, which has resulted in the deployment of varying levels of rolling blackouts known as 'load shedding' (Laher, Van Aardt, Craythorne, Van Welie, Malinga & Madi, 2019:899). This has allegedly been attributed to poor management, corruption allegations, failure to properly implement new infrastructure, and inadequate maintenance of existing power plants (Niselow, 2019:n.p). As SA's energy constraints worsen, they are not only hindering its economic growth but are also affecting HEIs' daily operations, preventing e-health tools' adoption from becoming sustainable. Reports indicate that SAs living below the poverty line face significant challenges in affording safer electrical alternatives since they are living below the poverty line (Statistics SA, 2018:9). Due to a lack of resources, poor ICT infrastructure, and inconsistent electricity supplies, emerging nations like SA are finding it difficult to effectively use e-health tools sustainably than developed economies (Fanta & Pretorius, 2018:136). Thus, addressing the digital divide is essential for universal healthcare access.

4.4.4 Challenges to the technological sustainability of e-health tools

Technical challenges, such as a lack of digital equipment and poor internet connectivity, often impede the sustainable adoption of e-health tools. Literature shows that to enable the provision of digital mental health care through technologies like m-health and telehealth, the sustainable use of e-health tools requires internet connectivity and technical equipment (Mbunge et al. 2022: 9). However, research indicates that SA suffers from a lack of technological equipment, and some areas frequently experience poor internet connectivity (Norris et al. 2013: 384). Budget constraints and limited funding account for the lack of equipment (Fagherazzi et al. 2020:6).

Mhlanga, Denhere and Moloi (2022:4) posit that inequalities have characterised SA's history, raising practical concerns about the sustainable adoption of e-health solutions for digital mental health technologies. Mbunge et al. (2022: 9) corroborate this argument noting unequal access to ICT tools and infrastructure in SA could worsen the digital divide. Consequently, this suggests that DMHS through e-health tools may lead to unequal access, particularly in rural areas with unreliable internet connectivity.

Bauman and Rivers (2015:31) communication challenges with e-health tools for DMHS are significant, particularly due to the absence of nonverbal cues in text-based or video sessions, which can lead to misunderstandings. In this regard, Van Wynsberghe and Gastmans (2009:471) state that if a therapist overlooks any critical clinical information, the entire diagnostic procedure and psychological evaluation may be weakened. Moreover, using email in this context may impede communication owing to time delays and a lack of immediacy, making it difficult to convey empathy, affection, and emotions. In light of these issues, e-health tools are not appropriate for all DMHS, thus limiting their sustainable adoption.

Regueiro, McMartin, Schaefer and Woody (2016:293) postulate that the therapist must not only possess the technical skills to effectively e-health tools but also have the ability to troubleshoot and restore systems in the event of technological failures while providing a digital mental health service. Research shows technological challenges in the therapy session are disruptive, disturbing, and can frustrate the patient (Reese et al. 2015: 280). From an e-health tools user or patient point of view, a lack of technical skills is likely to result in the lack of technological acceptance owing to their incapacity to operate or utilise the e-health tools (Baniasadi, Kalhori, Ayyoubzadeh, Zakerabasali & Pourmohamadkhan, 2018: 665).

Despite their effectiveness, e-health tools for DMHS raise ethical concerns (Wies et al. 2021:2; Lal, 2019:59). Arguably, the most significant ethical concerns in the utilisation of e-health tools for DMHS are privacy, confidentiality, and data security of the users. Privacy, confidentiality, and data security relate to how sensitive data obtained through the intervention is stored, and shared as well as ensuring that users feel safe and comfortable when disclosing confidential information. (Borghouts, Eikey, Mark, De Leon, Schueller, Schneider, Stadnick, Zheng, Mukamel & Sorkin, 2021:2; Wies et al. 2021:5). E-health technologies and the internet enable an environment in which patient information may be easily accessible and shared. It has been extensively reported that e-health users may purposefully or unintentionally expose or share sensitive information about themselves during the intervention (Taylor & Luce, 2003:21). Due to the sensitive nature of

personal information shared through e-health tools, and the potential for misuse or monitoring by corporations and governments, ethical concerns related to privacy, confidentiality, and data security are increasingly drawing the attention of various stakeholders. The ethical concerns are further exacerbated given that some third parties tend to gain access to user data in unethical ways. Supporting this viewpoint, Martinez-Martin and Kreitmair (2018:2) state that some organisations that provide free or low-cost DMHS typically sell or share user data for marketing reasons or other interests, of which the user may be unaware of. Moreover, digital mental health applications provided by the employer through wellness programmes may potentially expose users to violation of privacy and workplace discrimination (Ajunwa, 2017: n.p). Given that mental health data is regarded as more sensitive than other types of health data, the impact of ethical concerns linked to privacy, confidentiality, and data security is that they can put the users or patients at risk (Martinez-Martin & Kreitmair, 2018:2). Wies et al. (2021:5) goes further and argue that the risk of privacy breaches and security vulnerabilities make digital mental health technologies less acceptable.

Another ethical concern identified in the literature is that of informed consent to which e-health users are provided critical information about DMHS procedures as well as possible risks and benefits (Martinez-Martin & Kreitmair, 2018:4). Despite the importance of informed consent, researchers have identified a lack of clarity regarding whether the consent obtained through DMHS is sufficiently comprehensive for users (Perez Vallejos, Koene, Carter, Hunt, Woodard, Urquhart, Bergin & Statache, 2019:98). The consequences of poorly obtained informed consent is that users may consent to terms and conditions they do not fully understand. Martinez-Martin and Kreitmair (2018:4) note that information regarding the potential risks or how data will be managed is often included in the user agreement or terms and conditions column section. The same authors further state that the information in these terms and conditions or user agreements is generally written in complex and formal language that many users find difficult to understand. At the same time, it has been reported that users of e-health tools often do not take the time to thoroughly read the terms and conditions on websites or applications which can complicate DMHS and further expose users to risks (Pywell, Vijaykumar, Dodd & Coventry, 2020:11). It is on this premise that scholars suggest that more care should be taken to ensure that users are given a clear and acceptable summary of the risks and benefits before using DMHS (Martinez-Martin & Kreitmair (2018:4). Table 4.2 below summarises the challenges to the sustainable adoption e-health tools for DMHS.

Table 4.2: Summary of challenges to the sustainable adoption of e-health tools

Sustainability challenges	Brief explanation
Economic sustainability challenges	**Limited access to internet**: About half of SAs still lack access to the internet and data services (Gillwald et al. 2018:97). **Limited funding**: Some organisations find it difficult to invest in ICT infrastructure for DMHS owing to limited funding and budget constraints (Temesgen, 2019:37). **Lack of bandwidth management skills and poor internet policies:** SA HEIs lack bandwidth management skills and have poor internet policies that impact internet usage (Njenga, 2011:39).
Social sustainability challenges	**Lack of skills:** Owing to a lack of skills and end-users abilities to use e-health tools, DMHS are challenging to provide (Ahmad, 2014: 1288). **Poor health literacy:** Poor health literacy makes it difficult to understand and follow health instructions. This can lead to ineffective health self-management and insufficient preventative measures (Stormacq et al. 2019:249). **Lack of proficiency in the language of the e-health tools:** Although SA has 11 official languages, e-health tools are mostly available in English, German, French and Spanish (Norris et al. 2013: 385). **Lack of SA therapists proficient in other SA languages than English:** The use of e-health tools may be less acceptable due to a dearth of SA therapists who can communicate in SA languages other than English (James & Versteeg (2007:121). **Lack of awareness about e-health tools:** E-health tools can be used to improve mental health care in SA HEIs, but there is a lack of awareness about them (Grobbelaar & Uriona-Maldonado, 2019:849). **Misinformation and conspiracy theories:** When delivering DMHS through social media, misinformation and conspiracy theories present challenges given their increasing popularity (Mbunge et al. 2022: 9). **Inappropriateness:** For some individuals with serious mental health conditions, employing e-health tools to offer DMHS may not be effective (Brenes et al. 2011:8).

Environmental sustainability challenges	**Lack of management support:** The sustainable adoption of e-health tools has a very high likelihood of failing in the absence of senior management support (Johnson & Diman, 2017:13). **Limited government policy:** Limited government policy has a detrimental effect on the sustainable adoption of e-health tools (Ramdani et al. 2020:12). **Lack of resources:** Lack of essential resources, including electricity, ICT infrastructure, financial resources, and human resources, can make it more difficult to use e-health tools for DMHS on a long-term basis (Fanta & Pretorius, 2018:136).
Technological sustainability challenges	**Lack of digital equipment:** Budget constraints and limited funding account for the lack of digital equipment which impacts the sustainable adoption of e-health tools (Fagherazzi et al. 2020:6). **Ethical concerns:** Due to major ethical concerns regarding the privacy, confidentiality, data security, and informed consent of e-health tools, users may be reluctant and hesitant to utilise them (Borghouts et al. 2021:2; Wies et al. 2021:5). **Digital divide:** The SA population does not have the same access to digital devices and ICT infrastructure and this digital divide creates a division and inequality around the accessibility to DMHS (Mhlanga et al. 2022:4). **Communication issues:** Lack of nonverbal clues during therapy sessions, especially when using text-based media, telephone, or videoconferencing, may lead to misunderstandings as well as misinterpretations (Bauman & Rivers, 2015:31). **Technical difficulties:** Some individuals and therapists struggle to use e-health tools due to a lack of technical knowledge (Baniasadi et al. 2018: 665; Reese et al. 2015: 280). **Lack of user engagement:** Individuals may be hesitant or unwilling to use e-health tools due to a lack of understanding or trust in the technology.

Source: Author's own creation based on the literature review

4.5 Strategies for the sustainable adoption of e-health tools

The previous section presented a broad discussion of the challenges and their impact on the sustainable adoption of e-health tools. The challenges were explained under the economic, social, environmental, and technical pillars of sustainability. Despite these challenges, the study postulates that SA HEIs can successfully adopt e-health tools and ensure their successful use by embracing the strategies below. To maintain consistency, the strategies are presented under the four pillars of sustainability: economic, social, environmental, and technological.

4.5.1 Economic sustainability strategies for e-health tools

It can be argued that funding is the most important economic sustainability strategy as it supports the procurement of equipment and software, technology scaling, and other essential activities (Mbunge et al. 2022:8). Hence, the availability of funding facilitates the economic sustainability of the adoption of e-health tools. To achieve economic sustainability, there is a need to explore more sustainable sources of funding through diversifying and increasing partnerships with existing organisations especially in the private and public sectors (Jones, Stroetmann, Dobrev and Stroetmann (2011:4). This suggests that for the wider delivery of DMHS, partnering with hospitals and clinics, service providers, and other institutions to incorporate e-health tools into their current systems and processes is indispensable. Furthermore, a recent study by Mbunge et al. (2022:10) strongly suggests increasing financial allocation for virtual health care services, including funding for research and development. This is regarded as an integral part of the success of the sustainable adoption of e-health tools.

Financial incentives are other strategies that can be utilised by SA HEIs. This is particularly important because financial incentives help promote and facilitate the usage of e-health tools by offering rewards to the users. Supporting this economic sustainability strategy, Ricciardi, Mostashari, Murphy, Daniel and Siminerio (2013:378) affirm that financial incentives can motivate individuals to utilise e-health tools for DMHS, promoting sustainable adoption.

Khoja, Durrani, Scott, Sajwani and Piryani (2013:50) define affordability as the perceived fair value of a health service and the user's willingness and ability to pay. The economic sustainability strategy of e-health tools should help to drive the affordability of internet connections. Leon, Schneider and Daviaud (2012:10) argue that the economic sustainability of e-health tools is however influenced by the affordability of internet connection and the e-health system procurement prices. Considering that most e-health users have limited internet

connection, and some organisations find it costly to invest in ICT infrastructure, Jones et al. (2011:5) advise that organisations should integrate affordability with funding and procurement strategies to enhance their investment in e-health services. Mbunge et al. (2022:10) concur adding that since there is a substantial growth of Wi-Fi hotspots in metropolitan centres, organisations need to partner with network providers to expand community networks in areas with limited internet access. In doing so, the digital gap will be closed. The authors also suggest that to deliver virtual health care such as DMHS, financial and political commitment is necessary.

4.5.2 Social sustainability strategies for e-health tools

It is vital to ensure that the e-health tools' usability is simple and straightforward to use. This will make it possible to ensure that user's access DMHS effectively without any problems. Therefore, to ensure that the e-health tools meet the demands and are user-friendly, organisations must involve users (such as university staff), healthcare practitioners, and other stakeholders throughout the design and development process (Fanta & Pretorius, 2018:140). Van Dyk, Wentzel, Van Limburg, Gemert-Pijnen and Schutte (2012:4) argue that key stakeholders in particular end-users, should be involved in the process of adopting e-health tools from the onset to overcome potential resistance, enhance acceptability, and satisfy stakeholder demands. In view of this, engaging and collaborating with mental health professionals helps to ensure that e-health tools are evidence-based and meet professional standards. Thus, stakeholder involvement entails ascertaining if e-health tools fit its context.

Adequate training is essential for effective e-health tool usage (Baniasadi et al. 2018: 667). This suggests training support users in understanding and effectively using e-health tools for DMHS in SA HEIs. The amount of training provided to the university staff by internal or external entities can facilitate the effective usage of e-health tools for DMHS in SA HEIs (Tilahun & Fritz, 2015:15). Other scholars recommend that training should also include health care providers as it will equip them with the skills needed to deliver DMHS effectively using e-health tools (Mbunge et al. 2022:10).

To enhance awareness of and foster long-term use of e-health tools, organisations must develop and implement comprehensive educational initiatives and awareness campaigns. Due to the lack of understanding of how e-health tools work, Stoll, Müller and Trachsel (2020:9) argue that the implementation of e-health tools must include educational initiatives and awareness campaigns for both healthcare providers and users. The authors explain that this can be achieved through web-based tutorials, public education, and in-person support. According to Mbunge et al. (2022:10), who endorse this strategy, organisations should raise

awareness about the e-health tools that may be used to access DMHS, particularly during pandemics like COVID-19.

Communication is an integral part of social sustainability strategies. To ensure that the e-health tools are being effectively utilised, constant communication with users and providers of DMHS is necessary (Scott & Mars, 2013:9). Al-Mamary et al. (2014:123) assert that to promote informed decision-making, communication is essential for timely and precise exchange of information with all relevant stakeholders. For instance, organisations can regularly communicate information about available DMHS to all relevant stakeholders including university staff, to enhance informed decision-making. Parra, Sendra, Jiménez and Lloret (2016:13292) state that multimedia technologies such as video podcasts, audio slideshows and animated videos can be used to enhance communication in the workplace. In addition, mental health professionals need strategies to debunk misleading information and conspiracies, particularly on social media. In times of pandemics such as COVID-19, researchers make a compelling case for health experts and media to combat infodemics and smear campaigns to reduce anxiety and promote a coordinated response (Su, McDonnell, Wen, Kozak, Abbas, Šegalo, Li, Ahmad, Cheshmehzangi, Cai & Yang, 2021:6). Accordingly, communication is key in advancing and increasing the acceptability of e-health tools for DMHS in SA HEIs.

SA HEIs should consider delivering DMHS in all 12 official languages to reach a broader audience. This approach is especially beneficial for individuals who speak only SA languages other than English, who are excluded from utilising e-health tools effectively, as they may struggle to use e-health tools effectively due to language barriers (James & Versteeg, 2007:121).

Combining e-health tools with in-person therapy and telephonic interventions can help prevent the limitations of e-health tools for DMHS. Moreover, organisations need to encourage peer support through features such as forums and community chat rooms (Noar & Harrington, 2012:10). The use of e-health tools will thus be supported by their integration with existing mental health resources and support networks, such as hotlines and in-person psychotherapy services.

Balcombe and De Leo (2021:7) emphasise that organisations must conduct evaluations to ensure the effectiveness of e-health tools and their impact on delivering DMHS. This suggests it is vital for organisations to regularly assess the effectiveness of e-health tools by collecting user feedback to identify areas that require improvement and then implementing the appropriate changes timely.

4.5.3 Environmental sustainability strategies for e-health tools

Organisational top management plays a significant role in preventing or assisting the adoption of e-health solutions given their direct impact and capacity to source and distribute financial resources (Han, Liu, Evans, Song & Ma, 2020:7; Johnson & Diman, 2017:13). Thus, there is a need for top management support that can help in securing and allocating financial resources as well as inspiring and motivating university staff to use e-health tools for DMHS (Al-Mamary et al. 2014:123). Supporting this viewpoint, Han et al. (2020:7) assert that establishing a clear, recognisable, and proactive leadership that is capable of driving and managing all the stakeholders effectively is one of the most crucial components in fostering the long-term adoption of e-health tools.

Securing additional resources including the availability of electricity, ICT infrastructure, and financial and human resources are key environmental elements that have a considerable amount of potential to facilitate the sustainable adoption of e-health tools (Fanta & Pretorius, 2018:140). Therefore, to ensure the availability of electricity, solar energy should be considered as a renewable resource for SA HEIs as part of their commitment (Azimoh, Klintenberg, Mbohwa & Wallin, 2017:230). Top management and public-private partnerships are central to achieving this. In the modern-day era, the popularity of renewable sources, such as solar energy, has surged, and for good reasons. For instance, Kumar, Singh, Gupta, Nimdeo, Raushan, Deorankar, Kumar, Rout, Chanotiya, Pakhale and Nannaware (2023:14) make a compelling case for the significant potential of solar energy as a sustainable alternative to fossil fuels. The researchers further assert that using solar energy reduces carbon emissions and is a more environmentally friendly option to combat the issue of global warming. Alternatively, SA HEIs should consider installing generators in the event of a power outage so that daily operations including the use of e-health tools are not disrupted.

In addition to the above, SA HEIs need to leverage existing ICT infrastructure. This involves utilising existing infrastructure and technologies within the institutions and expanding their partnerships with external organisations to improve the scalability, security, and efficiency of e-health tools for DMHS on a long-term basis (Jones et al. (2011:3). As part of their efforts to provide mental health digital services, it is imperative that SA HEIs recruit experienced ICT employees with appropriate knowledge. This will help to ensure the sustainable adoption of e-health tools.

4.5.4 Technological sustainability strategies for e-health tools

In light of the fact that mental health data is considered to be more sensitive than other types of health data, ethical concerns related to privacy, confidentiality, and data security have the potential to harm patients as previously mentioned (Martinez-Martin & Kreitmair, 2018:2). Furthermore, Wies et al. (2021:5) contend that digital mental health technologies are less acceptable due to the risk of privacy breaches and security vulnerabilities. Therefore, it is important to ensure that the technologies (e-health tools) being used for DMHS are secure and reliable. This suggests that choosing e-health tools that have been tested and are renowned for their security features is extremely important for DMHS. Moreover, to protect sensitive user data, organisations must make sure the usage of e-health tools is secure and conforms with all applicable privacy regulations (Stoll et al. 2020:9). To protect patient safety, Baniasadi et al. (2018: 665) strongly suggest that organisations should stop using technology in situations when shortcomings cannot be addressed. This suggestion is particularly important, as the consequences of failing to do so could be severe.

A data privacy and security policy is another crucial strategy for the safe use of e-health tools. Its absence can significantly affect the effectiveness of e-health tools at SA HEIs to access DMHS (Scott & Mars, 2013:11). This implies that SA HEIs should have a well-defined data privacy and security policy for data management. Thus, it is imperative that SA HEIs develop a data privacy and security policy that should guide and strengthen the governance and usage of the internet in the institution specifically for the utilisation of e-health tools of DMHS.

The use of e-health tools for DMHS is enhanced by technical support. Research conducted by Al-Mamary, Shamsuddin and Aziati (2014:122) identified system, information and service quality as factors influencing e-health tool sustainability. These factors are further supported by Fanta and Pretorius (2018:139) who argue that system quality is associated with the ease of use, functionality, flexibility, reliability, integration, portability, and the significance of ICTs. In terms of information quality, Gorla, Somers and Wong (2010:213) maintain that it depends on the truthfulness, completeness, significance and credibility of data which influence the usage of e-health tools. With regard to service quality, Al-Mamary et al. (2014:122) argue that service quality represents the overall level of support provided to end users to meet their needs. In this study, it is the technical support that facilitates the sustainable adoption of e-health tools. To make sure that all the systems are operating at optimum levels and preventing any technical difficulties, technical support should also entail regular maintenance (Fanta & Pretorius, 2018:139; Al-Mamary et al. 2014:122). Thus, continuous technical support should be provided to users to ensure the effectiveness of e-health tools for DMHS. A summary of

the strategies for the sustainable adoption of e-health tools for DMHS can be found in Table 4.3 below.

Table 4.3: Summary of strategies for the sustainable adoption of e-health tools

Sustainability strategies	Brief explanation
Economic sustainability strategies	**Funding:** Increasing partnerships with private and public organisations to create more sustainable funding sources for DMHS (Jones et al. 2011:4). **Financial incentives:** Offering financial incentives to users to promote and increase e-health tool adoption (Ricciardi et al. 2013:378). **Affordability:** As Wi-Fi hotspots expand in metropolitan areas, SA HEIs must partner with internet providers to expand networks in areas with limited internet access and thereby close the digital gap (Mbunge et al. 2022:10).
Social sustainability strategies	**Stakeholders' involvement:** From the planning stage onward, end-users should be included to overcome possible resistance, increase acceptance, and meet stakeholder expectations (Fanta & Pretorius, 2018:140; Van Dyk et al. 2012:4). **Training:** It is critical to provide university staff and health care workers with adequate training so they can understand how e-health tools are utilised to deliver DMHS (Baniasadi et al. 2018: 667; Tilahun & Fritz, 2015:15; Mbunge et al. 2022:10). **Educational initiatives and awareness campaigns:** To enhance awareness of and foster long-term use of e-health tools, SA HEIs must consider implementing comprehensive educational initiatives and awareness campaigns (Mbunge et al. 2022:10; Stoll et al. 2020:9). **Communication**: To help all stakeholders make better decisions, SA HEIs should continually and timely communicate about significant matters, for instance, DMHS available (Scott & Mars, 2013:9; Al-Mamary et al. 2014:123). **Language diversity:** SA HEIs need to consider delivering DMHS in different languages from the 12 official SA languages (James & Versteeg, 2007:121). This will enable them to reach a significant number of users.

	Integration: E-health tools should be used in conjunction with a combination of in-person psychotherapy and telephone intervention, especially in cases of serious mental health illnesses (Noar & Harrington, 2012:10; Brenes et al. 2011:8). **Continuous evaluation and improvement:** SA HEIs must undergo an evaluation process to ensure the effectiveness of the e-health tools and their impact on the delivery of DMHS (Balcombe & De Leo, 2021:7).
Environmental sustainability strategies	**Top management support:** There is a need for top management support that can aid in finding and distributing financial resources as well as inspiring and motivating university staff to use e-health tools in the delivery of DMHS (Al-Mamary et al. 2014:123). **Securing additional resources:** Resources including the availability of electricity, ICT infrastructure, and financial and human resources are key environmental elements that have a significant amount of potential to facilitate the sustainable adoption of e-health tools (Fanta & Pretorius, 2018:140).
Technological sustainability strategies	**Robust data privacy and security systems:** Due to the risk of privacy breaches and security vulnerabilities, it is important to ensure that the technologies being used for DMHS are secure and reliable (Stoll et al. 2020:9). **Data security and security policy:** It is imperative that SA HEIs develop a data privacy and security policy for the utilisation of e-health tools and DMHS (Scott & Mars, 2013:11). Institutional Internet governance and usage should be guided and strengthened based on this process. **Technical support:** Continuous technical support should be provided to users to ensure the effectiveness of e-health tools in delivering DMHS (Fanta & Pretorius, 2018:139; Al-Mamary et al. 2014:122).

Source: Author's own creation based on the literature review

4.6 Summary

The chapter explained the concept of sustainability and its application to the adoption of e-health tools. The study demonstrated that definitions of the term 'sustainability' varied in literature, with some researchers incorporating specific features that constitute "sustainability"

while others did not. While there are several scholarly perspectives on the term sustainability, there is no universal definition that applies to all circumstances. Due to the lack of standardised terminology, sustainable adoption of e-health tools was defined as the capacity of the university to provide ongoing DMHS that benefit staff over a long period through e-health tools, while also being capable of addressing future mental health needs.

The chapter discussed the benefits of sustainable e-health adoption of e-health tools for DMHS. Some of the benefits discussed include increased access to mental health care, increased patient engagement, improved communication and reduced mental health care costs by using e-health tools, which increase efficiency and decrease in-person consultations or visits. Sustainable adoption of e-health tools allows for more flexible and efficient ways of providing mental health care, such as telehealth. Telehealth can provide remote access to mental health care services, particularly for people who prefer to seek help anonymously in fear of stigmatisation.

The chapter then explained the challenges associated with the sustainable adoption of e-health tools. The challenges were explained under the economic, social, environmental, and technical pillars of sustainability. The economic challenges relate to the difficulty of limited access to the internet, the high cost of investment in ICT infrastructure and lack of bandwidth management skills and poor internet policies. Social challenges arise from the lack of digital skills, poor health literacy, lack of proficiency in the language of the e-health tools, lack of SA therapists proficient in other SA languages than English, lack of awareness about e-health tools, misinformation and conspiracy theories and the inappropriateness of e-health tools in helping some individuals with serious mental health conditions. Environmental challenges include a lack of top management support, limited government policy and a shortage of resources. Technical challenges include the lack of digital equipment, ethical concerns, digital divide concerns, communication issues, technical difficulties as well as a lack of user engagement.

Finally, the chapter provided strategies that could be employed to encourage and facilitate the long-term use of e-health tools for DMHS in SA HEIs. To maintain consistency, the strategies for the sustainable adoption of e-health tools were presented under the four pillars of sustainability: economic, social, environmental, and technological. The strategies for the economic pillar included securing funding for digital mental health services, offering financial incentives to promote and facilitate the use of e-health tools and forming partnerships between SA HEIs and network providers to ensure internet connectivity in areas with limited access. The strategies for the social pillar focus on stakeholder involvement, providing training, implementing educational initiatives and awareness campaigns, ensuring continuous and

timely communication on important matters, delivering DMHS in all 12 official SA languages, integrating e-health tools with in-person psychotherapy, especially for serious mental health illnesses and continuously evaluating and improving the services. The strategies for the environmental pillar include top management support, and the provision of resources including the availability of electricity, ICT infrastructure, and financial and human resources. Finally, the strategies for the technological pillar should consist of the development of robust data privacy and security systems, the development of data security and security policy and the provision of continuous technical support. The next chapter provides a theoretical and conceptual framework for the study.

CHAPTER FIVE

THEORETICAL AND CONCEPTUAL FRAMEWORK FOR THE SUSTAINABLE ADOPTION OF E-HEALTH TOOLS

5.1 Introduction

This chapter serves two purposes. Firstly, it seeks to discuss the main theories that serve as the foundation for investigating and understanding the sustainable adoption of e-health tools. This is necessary to explore the ways in which theoretical frameworks and models can be used to inform and guide this study. Secondly, it seeks to present the conceptual framework for the study. This involves a presentation of the conceptual framework which will serve as the basis for developing and testing the hypothesis, guiding the design of the research instrument (questionnaire), and providing a basis for analysing the collected data.

5.2 Sustainable adoption of e-health tools for DMHS

The term technology adoption refers to the process that involves the making and execution of conscious decisions to use a specific technology (Jokonya, Kroeze & van der Poll, 2012:316). Sustainable adoption of e-health tools can be investigated from both individual and organisational perspectives and this study focuses on both. Technology adoption takes place when an individual and the organisation utilise the ICTs available and in this study e-health tools for DMHS (Van Slyke, Belanger, Johnson & Hightower, 2010:18). Researchers have in the past investigated how different ICTs are adopted (Jokonya et al. 2012:317). To that end, different models and theories have been put forward to explain how and why individuals and organisations adopt different ICTs.

Kerlinger and Lee (2000:11) define a theory as a set of interconnected concepts, terms, and propositions that explain and predict a phenomenon. Sandberg and Alvesson (2021:491) add that theories are mostly credible and scientifically acceptable sets of assumptions made to understand a phenomenon. Theories in research studies help to demarcate the scope of the investigation and further influence the selection of literature to review. Moreover, theories can serve as a useful guideline informing the underpinning theoretical framework for the research (Kivunja, 2018:46). In this regard, a theoretical framework refers to a structure that summarises concepts and theories. It is derived from thoroughly validated and published information, and the researcher synthesises it to provide a theoretical basis for data analysis and interpretation (Kivunja, 2018:46). Heale and Noble (2019:37) support the latter by stating that to explain what will be investigated and measured, a theoretical framework should present and reflect the concepts, variables, and relationships linked to the research study. In this study,

the utilisation of theoretical frameworks to understand the complex phenomena of the sustainable adoption of e-health tools was valuable.

5.3 Theoretical framework for the sustainable adoption of e-health tools

Owing to the complexities of the constructs under investigation, the study employed a combination of two theories: the Technology-Organisation-Environment (TOE) theoretical framework and the Technology Acceptance Model (TAM). To understand the selected theories fully, it is important to note that TAM is the most commonly used model for studying technology adoption from a user's perspective (Jokonya et al. 2012:317). It has also been widely referenced and extensively used in numerous studies that have been conducted on health-related matters including mental health issues (Rajak & Shaw, 2021:2; Razmak & Bélanger, 2018:310; Fonseca, Gorayeb & Canavarro, 2016:229; Lazuras & Dokou, 2016:11).

Despite its widespread usage in research, the TAM model is often criticised for failing to account for organisational and environmental elements that are critical to understanding technology adoption (Jokonya et al. 2012:317). However, TAM focuses more on the technical characteristics and personal beliefs about the use of technology (Johnson & Diman, 2017:8). It is for these reasons that this study considered another suitable and appropriate theory that fills the gap left by TAM, the TOE framework. The TOE framework is commonly used to study technology adoption (Jere & Ngidi, 2020: 4; Walker & Brown, 2020: 2). This study contributes to knowledge by applying TOE and TAM to investigate the sustainable adoption of e-health tools for DMHS in a SA HEI. The following section provides a detailed explanation of the TOE and TAM theories and how each theory contributes to the understanding of the constructs of this study.

5.3.1 TOE framework

Tornatzky, Fleischer and Chakrabarti (1990) developed the TOE framework, which comprehensively describes an organisation's technology adoption. The framework consists of three constructs: technological, organisational, and environmental, as illustrated in Figure 5.1.

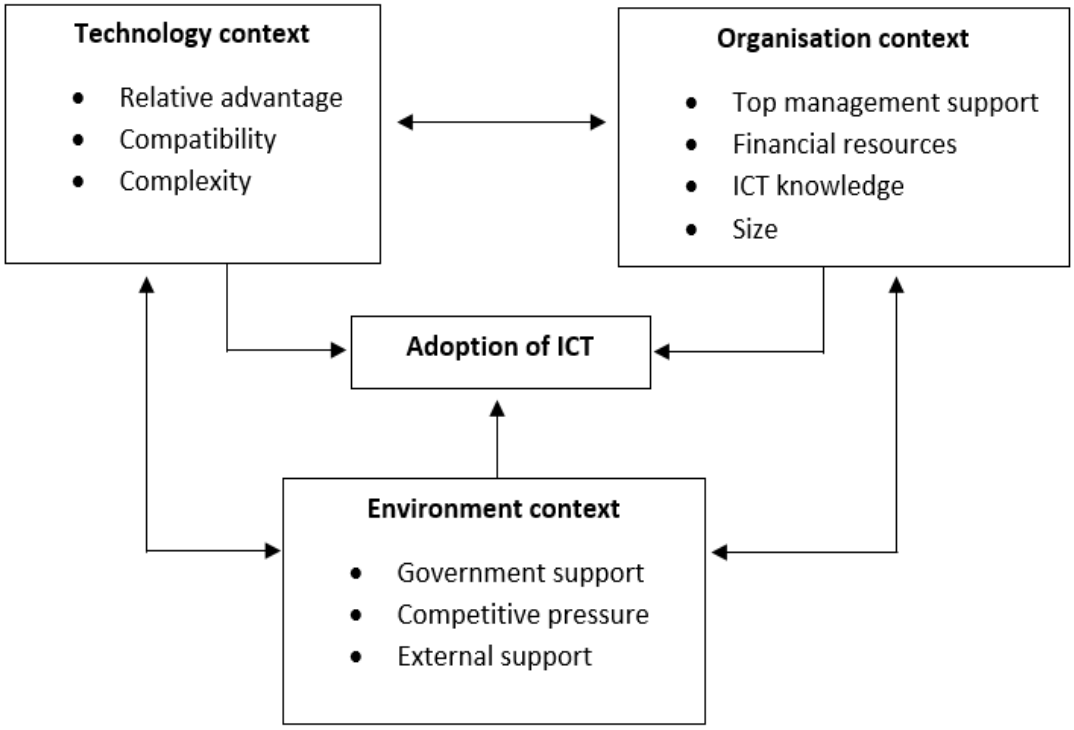


Figure 5.1: TOE framework

Source: Tornatzky, Fleischer and Chakrabarti (1990)

5.3.1.1 Technology context

Technology context focuses on internal and external technologies vital to the organisation. Baker (2012: 232) notes that organisations need ICT infrastructure, technical skills, and user time for effective technology adoption. Jere and Ngidi (2020:3) argue that technology adoption often occurs in organisations that are already experienced with technological innovation. Therefore, in this study, it is assumed that if the selected university and the implementing partners (Higher Health, SADAG and Momentum Health) are familiar with the e-health tools, it is probable that they will use them effectively to deliver DMHS.

5.3.1.2 Relative advantage

Relative advantage is a technical factor thought to bring more advantages to the organisation (Hiran & Henten, 2020:443). The relative advantages to SA universities as a result of embracing e-health tools are the benefits that the universities receive from employing e-health tools for DMHS. Therefore, the bigger the perceived relative advantage of e-health tools, the greater the likelihood of adoption (Han et al. 2020: 7). The SA HEIs should therefore evaluate whether adopting e-health tools for digital mental health service delivery will provide more

benefits to their university staff compared to the current system. E-health tools provide several benefits for DMHS, including the ability to customise them to meet specific needs and the convenience of accessing sensitive information anonymously at any time (Ryan, Shochet & Stallman, 2010:74-75; Taylor & Luce, 2003:18). In addition, internet-based e-health tools provide an alternative option for users who do not prefer to utilise traditional face-to-face services or who face geographic restrictions (Taylor & Luce, 2003:19). Research shows e-health tools provide privacy, which helps to reduce stigma and avoid common barriers associated with seeking mental help from professionals (Bernecker, Banschback, Santorelli & Constantino, 2017:2). However, it is important that when using e-health tools for DMHS, the providers must adhere to all ethical guidelines (Bauer, Glenn, Monteith, Bauer, Whybrow & Geddes, 2017:9).

5.3.1.2 Compatibility

Compatibility reflects the degree to which technological improvements are assumed to align with the organisation's current technologies or information systems and previous experience (Han et al. 2020: 7). Therefore, if management and other stakeholders believe that e-health tools are compatible with the existing technologies, ICT infrastructure and other processes, then it is probable and easier to adopt e-health tools for DMHS in SA HEIs (Jere & Ngidi, 2020:3). Hiran and Henten (2020:443) argue that the internet has become the primary means of worldwide communication. As a result, e-health tools are consistent with the internet and can be effectively utilised to significantly increase access to DMHS.

5.3.1.3 Complexity

Jere and Ngidi (2020:3) assert that when an organisation perceives ease of use, technology is much more likely to be accepted quickly, whereas complicated technologies are more likely to be adopted slowly. The complexity of technology influences the adoption or non-adoption of technology because stakeholders in organisations believe that complicated ICTs are too difficult to embrace and, if implemented, they would be abandoned quickly (Jere & Ngidi, 2020:3). So, the more complicated the technology, the less likely it is to be embraced by the organisation (Han et al. 2020: 7).

5.3.2 Organisational context

The organisational context includes the top management support, financial resources, ICT knowledge and size of the organisation. The organisational context influences adoption in a variety of ways.

5.3.2.1 Top management support

Recent research shows top management support is one of the most important factors in technology adoption (Walker & Brown 2020:8). However, this is not surprising because top management has direct influence and authority to secure and allocate financial resources (Johnson & Diman, 2017:13). Han et al. (2020: 8) argues that top management advocates for change, which means they may either obstruct or support the use of technology. Therefore, without top management support, sustainable adoption of e-health tools to deliver DMHS in SA HEIs can fail to succeed.

5.3.2.2 Financial resources

Financial resources also impact technology adoption, and recent research reports in low-income economies and, one of the most significant restrictions is a lack of financial resources (Hiran & Henten, 2020:445). Therefore, the higher the financial resources required to adopt e-health tools; the less likely SA HEIs will adopt internet-based e-health tools for DMHS. This statement is consistent with a recent study, which revealed that in some low-income economies, lack of adequate funding to create, run, and manage online platforms, as well as telecommunications costs are key impediments to e-health initiatives (Fagherazzi et al. 2020:6). Thus, if sustainable adoption for delivering DMHS in SA HEIs is perceived as a costly investment considering consulting fees, technical expenses such as hardware, software licenses, and ongoing implementation and maintenance costs there is a lower likelihood that they will adopt these tools (Johnson & Diman, 2017:14).

5.3.2.3 ICT knowledge

Organisations need employees with ICT knowledge who can help them in the adoption and utilisation of technological innovations (Jere & Ngidi, 2020:3). Small businesses usually lack a structured and established ICT department, and studies suggest that they may not adopt advanced technology owing to a lack of support (Johnson & Diman, 2017:13). However, large organisations such as SA HEIs are more likely to have a dedicated ICT department and will rely heavily on their employees with relevant ICT knowledge to support any new technologies that will be adopted. However, Johnson and Diman (2017:13) argue that not all employees have the same skillsets and capacities to embrace technology, and certain organisations usually lack the specialised technical skills required to implement technology. Poor ICT knowledge and technical abilities have a detrimental impact on technology adoption in small businesses, whereas good ICT knowledge and skills encourage organisations to embrace new technologies in large organisations. Empirical evidence supports these arguments with

research findings showing that human resource ICT expertise influences the adoption process in large organisations (Walker & Brown, 2019:6) and small businesses with limited ICT expertise are less prone to embrace new technologies (Johnson & Diman, 2017:13). Since SA HEIs are large institutions with established ICT departments together with external partners (DMHS providers), it is thus expected that they are more inclined to accept e-health tools for DMHS as a result of their employees' better ICT knowledge and abilities.

5.3.2.4 Size of the organisation

Organisational size facilitates and influences technology adoption in organisations (Ramdani, Duan, & Berrou, 2020:12). Therefore, the size of the university can impact the sustainable adoption of e-health tools. Previous studies show that large organisations have an advantage over small organisations and are more likely to adopt new technologies (Awa & Ojiabo, 2016:918; Ramdani, Chevers & Williams, 2013:747). Han et al. (2020: 7) note that large organisations have resources, talent, and research and development capacity for successful technology adoption.

5.3.3. The environment context

The final context of the TOE framework is the environmental context. It refers to all external variables that might impact or limit the adoption of technology (Baker, 2012:151). The environmental context includes government support, external support, and competitive pressure.

5.3.3.1 Government support

Government policy can either have a beneficial or a detrimental impact on the adoption and usage of ICTs in SA HEIs (Baker, 2012:151). For this study, government policy refers to the policies developed by DHET via their national implementation agent Higher Health. Research shows government support influences organisational decisions to adopt ICT for healthcare (Han et al. 2020: 8). Fagherazzi et al. (2020:4) report that during COVID-19, government policies and DMHS initiatives were important to the utilisation of e-health tools. However, Liang, Qi, Wei and Chen (2017:11) state that government policies and regulations can hinder innovative technology adoption. Since the majority of SA HEIs are public institutions, government support including policies and regulations can encourage or prevent institutions from utilising e-health tools for DMHS.

5.3.3.2 Competitive pressure

Competitive pressure relates to the way influence from rivals impacts an organisation's utilisation of technology. Previous research concurs that external pressure from competitors influences technology adoption (Wanyoike, Mukulu & Waititu, 2012:73; El-Gohary, 2012: 1265). It is the pressure to be more innovative, efficient and effective that influences technology adoption in organisations (Sligo, Gauld, Roberts & Villa, 2017:93). In the SA HEIs, the external pressure to ensure productivity owing to a healthy and highly driven workforce can influence HEIs to adopt and use e-health tools for DMHS.

5.3.3.3 External support

The availability of external assistance in the adoption of technology is referred to as external support and the adoption of e-health tools requires external support. Han et al. (2020: 8) argue that it is difficult and demanding for an organisation to embrace technological innovations, without external support. Nowadays, the popularity of outsourcing may lead to a greater willingness among SA HEIs to accept and utilise e-health tools for DMHS. External support throughout this study refers to the DHET via an implementation agent Higher Health and the service provider SADAG. Momentum Wellness, a brand of Momentum Metropolitan Holdings Limited, is also part of the list of companies providing external support. Higher Health, SADAG and Momentum Wellness provide SA universities with the necessary assistance and expertise associated with the adoption of e-health tools to deliver DMHS. SA HEIs generally focus on the primary areas of their institutions and often lack the technical expertise and knowledge needed to adopt and use new technology (Maphalala & Adigun, 2020:10). Thus, when adopting and utilising e-health tools for DMHS, third-party support is required.

5.3.4 Technology Acceptance Model (TAM)

Davis (1989:320) designed and theorised TAM to explain user acceptance or rejection of new technology. TAM evolved from the TRA, which focuses on explaining user attitudes and intentions to utilise a given technology, therefore anticipating human behaviour (Fishbein & Ajzen, 1975). TAM is a widely used and accepted theory to investigate the elements and perceptions that impact technology adoption. The purpose of using TAM is to promote the usage of ICTs by encouraging and promoting their acceptability. However, technology acceptability can be advanced and supported if the variables that affect it are established, which may be done by investigating the user's experiences and views of the technology's usage. This is addressed in this study by investigating factors that impact the sustainable adoption of e-health tools. Davis (1989:320) postulated that the key elements that determine

user acceptability are perceived ease of use and perceived usefulness. Furthermore, an individual's attitude about the use of technology influences his or her desire to embrace technology. Perceived usefulness is also thought to have a direct effect on behavioural intention, as shown in Figure 5.2 below.

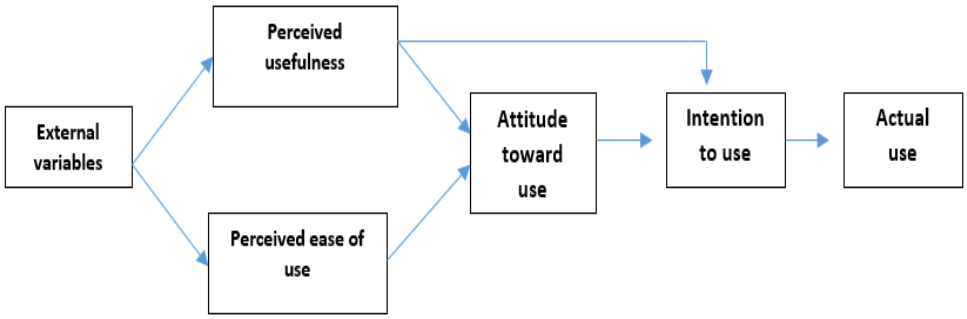


Figure 5.2: TAM

Source: Davis (1989:320)

5.3.4.1 Perceived usefulness

When investigating the sustainable adoption of e-health tools, perceived usefulness is an essential element to consider. Davis (1989:320) states that perceived usefulness is the extent to which a user is confident in embracing and utilising certain technologies to improve performance outcomes. This means the user perceives technology to be useful for the task they want to do. Perceived usefulness in this study refers to the degree to which utilising e-health tools would improve the delivery of DMHS at University X. It is assumed that if university staff believes that e-health tools possess desirable attributes that could ensure the long-term availability of DMHS and mitigate the impact of mental health issues at the University X, they are likely to develop positive attitudes towards using e-health tools. Furthermore, perceived usefulness is also a factor that can affect users' behavioural intention to embrace and use e-health tools for DMHS.

5.3.4.2 Perceived ease of use

The perceived ease of use of e-health tools is another important element driving user adoption. Davis (1989:320) defines perceived ease of use as the degree to which a person feels that utilising a specific system would be effortless. From this definition, it can be argued that perceived ease of use is linked with the 'user-friendliness' of the technology. Thus, the easier it is to utilise technology, the more beneficial it may be (Melzner et al. 2014:1378). A recent

study concluded that perceived ease of use impacts the adoption and usage of e-health tools (Bamufleh, Alshamari, Alsobhi, Ezzi & Alruhaili, 2021:17). In the present study, perceived ease of use relates to the ease of e-health tools in delivering DMHS and this will be effortless for the university staff.

5.3.4.3 Attitude towards use

Another factor that impacts technology adoption is one's attitude toward technology. Davis (1989:321) posits that the individual's attitude about the usage of technology drives behavioural intention to embrace and utilise it. A recent study reported that attitude is an important factor that influences behavioural intention to adopt e-health tools (Bamufleh et al. 2021:17). According to Robbins et al. (2019:99), an attitude refers to evaluative statements or judgements regarding objects, people, or events. These statements are either favourable or unfavourable and they reflect how one feels about something. Robbins et al. (2019:99) postulate that attitudes are closely associated with a behavioural component, a desire to behave in a particular manner toward something or someone. For this study, an attitude refers to the extent to which university staff are favourably or adversely disposed toward the adoption of e-health tools in delivering DMHS. To ensure the success of e-health tools adoption, it is necessary to study user attitudes, which directly impact behavioural intention to utilise the technology. It was therefore postulated that if university employees have a favourable attitude toward e-health tools, they will embrace and use e-health tools for DMHS.

5.3.4.4 Behavioural intention to use

According to Davis (1989:321), behavioural intention to use reflects the likelihood of embracing technology and in this study e-health tools for DMHS. As a key component influencing how a person utilises technology, behavioural intention to use ties together the perception of the technology and the actual behaviour of the user. The results from a recent study by Gbollie, Bantjes, Jarvis, Swandevelder, Du Plessis, Shadwell, Davids, Gerber, Holland and Hunt (2023:18) indicated that there is a high behavioural intention to use e-health tools for DMHS. This demonstrates the potential for e-health tools for DMHS to be widely used in the future. Accordingly, this study postulates that a key influencing factor of sustainable adoption of DMHS by university staff is their behavioural intention to use e-health tools.

5.4 Conceptual framework for the sustainable adoption of e-health tools

A conceptual framework is a model that the study considers "best" at explaining the development of the phenomena being investigated (Jabareen, 2009:51). It explains the primary issues under investigation visually or narratively, emphasising the important variables,

constructs, or components as well as their potential linkages. It is for this reason that authors such as Adom, Hussein and Agyem (2018:438) accentuate the importance of a framework for strong research. In this study, insights from the literature review Chapters (Chapters Two to Five) underpinned the foundation of the conceptual framework, leading to hypothesis development.

Below is Figure 5.3 which shows the conceptual framework for this study. It comprises the context of mental health issues in SA HEIs, the current state of e-health tools, technology adoption factors, sustainable adoption strategies, outcomes, sustainable adoption of e-health tools and the experiences gained during COVID-19. The next section discusses the constructs of the conceptual framework and their relationships, helping to understand their interactions and interpret research findings.

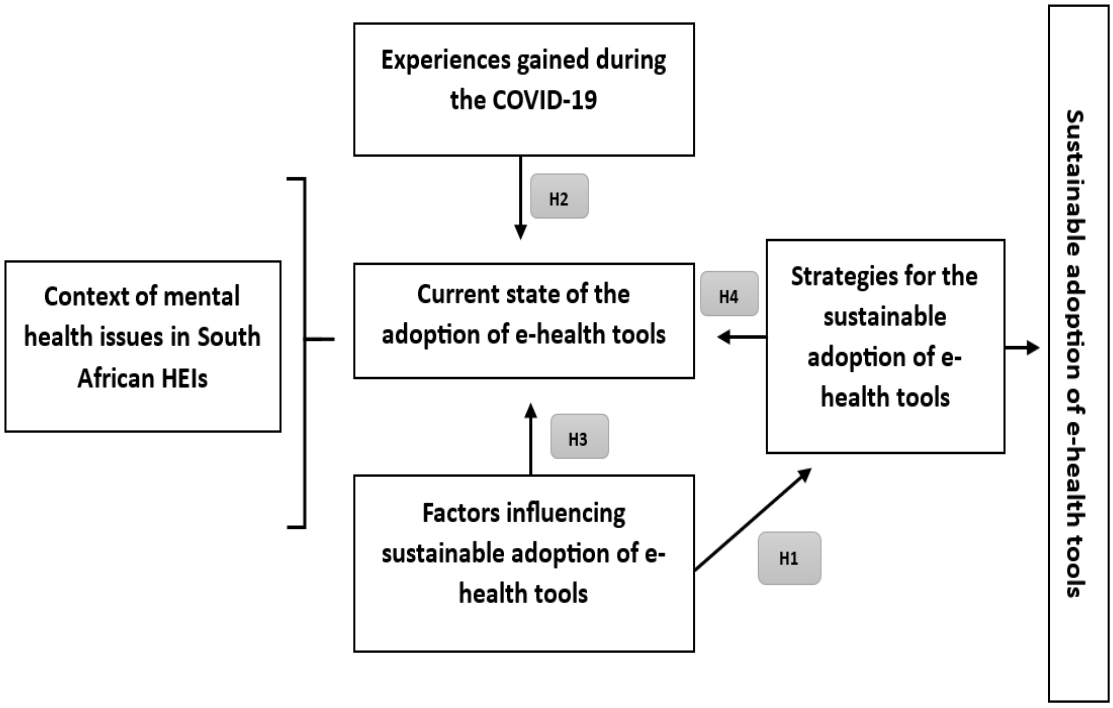


Figure 5.3: Conceptual framework for the sustainable adoption of e-health tools

Source: Author's construction based on literature review

5.4.1 Explanation of the conceptual framework

As illustrated in Figure 5.2 above, the conceptual framework for the sustainable adoption of e-health tools is an integration of constructs of the TOE framework and TAM model as well as other theoretical elements derived from the literature review. As per literature search in scientific databases, no single technology adoption theory could adequately explain the

sustainable adoption of e-health tools. The TAM model, for example, is widely criticised for failing to account for organisational and environmental elements critical to understanding technology adoption although it has widespread usage in research (Jokonya et al. 2012:317). It is on that premise that the study considered the TOE framework, as a suitable and appropriate theory to fill the gap left by TAM resulting in the integration of the TOE framework and TAM model. This however is not completely new in technology adoption studies as the TAM model has often been incorporated with other frameworks to strengthen its use. For example, the unified theory of acceptance and use of technology (UTAUT) model combines elements from the TAM model with motivation and social influences, to form a more comprehensive framework for technology adoption (Venkatesh, Morris, Davis & Davis (2003:447). However, in this study, the TAM model is incorporated with constructs from the TOE framework to enhance its application in understanding the sustainable adoption of e-health tools that can be achieved in a SA HEI setting. This indicates that the TAM model alone is not sufficient for understanding the complexities of sustainable adoption of e-health tools in a SA HEI. Therefore, the TOE framework is used to provide additional context and insight. The combination of the two frameworks was expected to produce a better understanding and further provide a robust explanation of the sustainable adoption process of e-health tools.

5.4.2 Context of mental health issues in SA HEIs

Recognising the background of mental health concerns in SA HEIs is the first step in developing the conceptual framework. It follows that SA HEIs are crucial institutions for HE, research and social development (Ylijoki, 2013:242; Pouris & Inglesi-Lotz, 2014:1). Thus, for the long-term adoption of e-health tools to be sustainable and to guide policymakers and other key stakeholders make informed decisions, it is imperative to comprehend the context of mental health concerns in SA HEIs. The literature review demonstrated that factors contributing to mental health issues, benefits of mental health, common mental health disorders, consequences of poor mental health, and mental health disorder management should be understood as part of the sustainable adoption of e-health tools in DMHS.

5.4.3 Experiences gained during COVID-19

The conceptual framework also includes experiences gained during COVID-19. As revealed in Chapter Three, e-health tools were used for DMHS during the pandemic and University X worked with Higher Health and SADAG to develop and launch various DMHS. In this way, university staff were able to cope with the mental health issues caused by the pandemic. In addition, University X partnered with Momentum Wellness to provide employee well-being services, demonstrating a further commitment to employee mental health. Moreover,

University X also offered coping strategies and stress management workshops and provided online resources for staff. However, there is limited knowledge of the actual user experiences gained at University X during the COVID-19 pandemic. Therefore, it is postulated that a broad understanding of the experiences gained during COVID-19 will help to inform the current state of the adoption of e-health tools.

5.4.4 Current state of the adoption of e-health tools

A thorough scrutiny and understanding of the current state of the adoption of e-health tools is imperative for the sustainable adoption of e-health tools. This is important because it provides insights into the current state and the challenges that need to be addressed to ensure the sustainable adoption of e-health tools in the workplace. It also allows for the identification of potential opportunities that may influence the sustainable adoption of e-health tools. Thus, providing a roadmap for their sustainable adoption.

5.4.5 Factors influencing sustainable adoption of e-health tools

The conceptual framework is based on the idea that sustainable adoption of e-health tools requires a combination of factors such as technological factors, organisational factors, social factors (user-related), and environmental factors. The conceptual framework provides a comprehensive view of factors influencing the continued use of e-health tools, aiding in the development of strategies for the long use of e-health tools. Moreover, the identification and understanding of the factors that influence the sustainable adoption of e-health tools will improve the current state of the adoption of these tools.

5.4.6 Strategies for the sustainable adoption of e-health tools

In SA HEIs, using e-health tools for DMHS can be challenging and overwhelming. Therefore, it is important to develop effective strategies to sustainably adopt e-health tools for DMHS. It is postulated that University X can successfully embrace e-health tools and achieve their successful usage by their users (university staff) by following the economic, social, environmental, and technological strategies that will facilitate their success in implementation. This will ensure that all the sustainability pillars are considered as they underpin the pillars of the concept. Moreover, this will simultaneously ensure the improvement of the current state of the adoption of e-health tools and further enhance the successful adoption of e-health tools for DMHS.

5.4.7 Sustainable adoption of e-health tools

It is expected that University X will achieve sustainability by successfully implementing sustainable adoption strategies for e-health tools. Thus, sustainability at University X will be reflected in the benefits for users (university staff), mental health care providers and University X. Eventually, with the successful implementation of various strategies and adoption of e-health tools, University X will make significant progress in advancing sustainability efforts of the UN SDGs, particularly SDG 3: Good health and well-being, which aims to “ensure healthy lives and promote well-being for all at all ages”. Thus, contributing to the long-term continuous provision of DMHS, reducing the impact of mental health challenges in the workplace and enhancing access to mental health care for university staff.

5.5 Hypotheses development

The conceptual framework presented in Figure 5.3 above illustrates four hypothesised relationships for the study. These relationships serve as the basis for testing the hypotheses of the study which will be elucidated in the subsequent chapters. Thus, deducing from the conceptual framework presented in Figure 5.2 above and as broadly explained in the literature review, the following hypotheses are proposed:

Hypothesis 1

H_0: A positive relationship does not exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

H_1: A positive relationship does exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

Hypothesis 2

H_0: A positive relationship does not exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.

H_1: A positive relationship does exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.

Sub hypothesis 3

H_0: A positive relationship does not exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and factors that influence their sustainable adoption to deliver DMHS.

H_1: A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and factors that influence their sustainable adoption to deliver DMHS.

Sub hypothesis 4

H_0: A positive relationship does not exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

H_1: A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

5.6 Summary

The chapter aimed to explore the theoretical and conceptual framework for the sustainable adoption of e-health tools. Due to the complexity of the research constructs under investigation, the study utilised a combination of two theories to provide a comprehensive and holistic analysis of the research constructs: the TOE framework and the TAM model. On the one hand, the TOE framework presents a holistic view of the environment in which the technology is situated. It also examines the external environment, the organisation's internal environment, and the technology itself. On the other hand, TAM provides insights into how users perceive and evaluate technology, as well as how they decide to use it. By combining the two theories, the study was able to provide a comprehensive insight into the research constructs. The robustness of the study constructs was strengthened by the addition of new constructs supported by the literature. This led to the development of the conceptual framework for the sustainable adoption of e-health tools in delivering DMHS at a selected SA HEI. Moreover, the conceptual framework acted as an integral element in designing the research instrument and it also served as the basis for testing the study's hypotheses, enabling the validation or rejection of the hypotheses established in Chapter One.

CHAPTER SIX

RESEARCH METHODOLOGY

6.1 Introduction

Informed by the extensive literature review chapters which positioned the study within the existing body of knowledge, this chapter details the research methodology applied to conduct the study. This sheds details on how the researcher reached the conclusions. The chapter begins by revisiting the research objectives and then covers the research design, paradigm, methods, population, sampling, data collection instrument and procedures, data analysis and ethical considerations.

6.2 Research objectives revisited

Main objective

As stated in Chapter One, the main purpose of this study was to develop a framework for the sustainable adoption of e-health tools that would enable the selected university to provide DMHS to university staff. The sub-objectives of the study were:

Sub-objective 1

To investigate whether a positive relationship does exist between the factors that influence sustainable adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

Sub-objective 2

To investigate whether a positive relationship does exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.

Sub-objective 3

To investigate whether a positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and factors that influence their sustainable adoption to deliver DMHS.

Sub-objective 4

To investigate whether a positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

6.3 Research design

Research design is vital to every research study. It is the blueprint that provides a 'roadmap' or 'master plan' for conducting a research study (Quinlan, Babin, Babin, Carr, Griffin & Zikmund 2015:2). As the main purpose of the study was to develop a framework for sustainable adoption of e-health tools that would enable the selected university to provide DMHS to university staff, the study adopted a case study research design to direct all the activities. Bryman and Bell (2011:110) define a case study as a comprehensive study of a specific 'unit' within its real-life settings. The case study was conducted in a single case of one selected public university in Cape Town, SA. The selected university offers contact-based HE. The major reason for utilising a case study was to effectively manage and understand the sustainable adoption of e-health tools for DMHS in one SA HEI rather than a broader-scale study of all 26 public HEIs in SA (Rule & John, 2011:8; Quinlan et al. 2015:163). Furthermore, the selection of a single case was influenced by multiple factors. These include the extent to which the researcher can access the selected university, the location of the selected university (Cape Town), the fact that it is the largest public HEI in the province, and the university's perceived interest in participating in research activities concerning the sustainable adoption of e-health tools for DMHS. In addition, the selection of the single case was motivated by the observed early e-health interventions for DMHS at the selected SA HEI. This necessitated the need to understand how the experiences gained during the COVID-19 pandemic would impact the sustainable adoption of e-health tools in delivering DMHS in the future.

The case study research design was complemented by a survey research design. Maree and Pietersen (2019:196) assert that survey research design involves the collection of data in a structured format from a large sample of a population of interest and in the present study, it is comprised of university staff. Quinlan et al. (2015:146) stress that surveys tend to be quantitative and often use questionnaires, and the data collected is statistically analysed so that meaningful conclusions can be drawn. In this study, the researcher conducted a survey within a single case of one selected university which then incorporated and primarily relied on quantitative data to develop a framework for the sustainable adoption of e-health tools in delivering DMHS.

There were no experiments conducted in this study. This approach was considered the most applicable to this study because of the difficulties associated with controlling, influencing, regulating, and modifying all the variables in social science situations and the phenomena in this study (Bordens & Abbott, 2011:104; Quinlan et al. 2015: 146). This approach allowed the collection of data within its natural environment, thus providing a realistic and credible depiction of the phenomena being examined. However, to conclude, the study relied extensively on the respondents' experiences, views, and perceived knowledge of the sustainable adoption of e-health tools for the delivery of DMHS to provide empirical evidence.

6.4 Research paradigm

Empirical investigations are generally founded on theoretical assumptions that serve as the foundation for effective research. Moreover, they include appropriate methods for addressing the main and subproblems. Denscombe (2011:116) argues further and asserts that researchers should be well-informed about the research paradigm that underpins their studies. However, Chilisa and Kawulich (2011:2) maintain that no single research paradigm is accurate and perfect. As such, researchers must establish a research paradigm for their investigations depending on how it supports the research strategy and addresses the main and sub-problems. For this study, the researcher chose the positivist research paradigm since the purpose was to understand the social world by using scientific methods that are objective and measurable (Quinlan et al. 2015:55; Bryman & Bell, 2011:17). The positivist paradigm assumes that phenomena can be studied objectively, and that data can be statistically analysed to predict future outcomes. The positivist paradigm focuses on causal relationships and quantitative data. This means that the researcher sought to look at the data objectively, with no personal bias or opinion. In addition, it also means that the data was collected and analysed with scientific methods, to gain a better understanding of the social world. Thus, the position of the study was to understand respondents who had adopted or intended to adopt and use e-health tools for DMHS at a selected SA HEI. Therefore, the respondents' views and experiences of the reality of e-health tools at a selected HEI were highly relevant.

This study was supported by empirical evidence as opposed to theoretical reasoning. Kaboub (2008:343) concurs with Chilisa and Kawulich (2011:3) that the positivist research paradigm regards knowledge as objective and can be characterised by quantifiable properties, hence quantitative approaches are more likely to be used. The positivist research paradigm employed in this study embraces quantitative strategies, and processes used in the natural sciences to objectively understand the social world (Chilisa & Kawulich, 2011:2). Thus, this study was firmly rooted in the positivist research paradigm and relied heavily on quantitative approaches.

6.5 Approach to theory development

To conduct this study, a deductive research approach was employed where hypotheses were developed and empirically tested. According to Bryman and Bell (2011:9), the deductive research approach is based on a theoretical framework and involves deriving logical conclusions from existing knowledge. It follows that the deductive approach is an approach to inquiry that is based on what is known about a particular subject, both theoretically and empirically. This process of deduction is illustrated in Figure 6.1, which illustrates the process through which hypotheses are generated and tested empirically.

Figure 6.1: The process of deduction

Source: Bryman and Bell (2011:9)

Quinlan et al. (2015:79) elucidate that the deductive research approach is useful for establishing cause-and-effect relationships between variables for testing hypotheses and drawing conclusions from specific data sets. Moreover, Bryman and Bell (2011:9), expound that the application of the deductive research approach implies that the researcher is independent of what is investigated and objective throughout the investigation. This is precisely what the researcher was interested in, in this study. In addition, the availability of an extensive body of literature from which a conceptual framework was developed further supported the application of the deductive approach in this study.

As De Vos et al. (2011:48) allude to, deductive approaches typically use large sample sizes and are highly structured to draw conclusions from quantitative data. It was, therefore, important to use the deductive approach in this study to benefit from its application, particularly its highly structured nature, and the ability to draw conclusions from large sample sizes. This would help to validate the theories by testing their predictions and ensuring their consistency in empirical evidence and their validity. In so doing, this would result in discovering any gaps in existing knowledge, providing an opportunity for further research studies.

6.6 Research method

As supported by Quinlan et al. (2015: 146), the survey research design applied in this study made use of quantitative data. In essence, the study employed quantitative research methodologies, which entail the collection, analysis, and interpretation of statistical data (Crowther & Lancaster, 2009:75). Creswell, Vicki, Michelle and William (2003:203) state that the quantitative research approach involves the collection of data that can be expressed numerically. In addition, quantitative methods are used to test a hypothesis and the theory (Antwi & Hamza, 2015: 220). As a result, unlike qualitative research methodologies, quantitative research does not permit subjective opinions (Burns & Bush, 2012:115). Therefore, the utilisation of quantitative methods in this study was to facilitate the identification of patterns and relationships that are not always visible when using qualitative methods. Moreover, quantitative methods were employed to improve precision and objectivity in this research study. Furthermore, quantitative research methods are usually employed with large sample sizes to produce generalisable results (Zikmund, Babin, Carr & Griffin, 2013: 385). Also, it is imperative to keep in mind that quantitative research methods include inquiry strategies, and data is often obtained using predefined instruments such as questionnaires that aid in producing statistical data (Creswell et al. 2003: 230). As a result, this study employed quantitative research to test the research hypotheses, measure variables, and analyse data to draw meaningful conclusions.

6.7 Research population

Zikmund et al. (2013: 385) define a research population as the entire group that shares a common set of characteristics and from which a research sample is drawn. It represents the portion of the population to be studied. The selection of the research population is guided by the research questions and the specific characteristics of the group that the researcher intends to study. Thus, the research population must be chosen carefully to ensure that the research questions are addressed.

For this study, the research population consisted of all public HEIs in SA that offer a contact mode of teaching and learning and this criterion resulted in the inclusion of 25 out of 26 public HEIs in SA. However, the target population for this study was narrowed down to one university located in Cape Town, SA with a combined staff complement of approximately 2840. For ethical reasons, the selected university for this study will not be revealed. The sample units for the study included management, academic and non-academic staff who used or intend to use e-health tools for DMHS.

6.8 Research sampling technique

It is challenging and almost impossible to investigate the entire research population. This is due to common constraints typically faced by researchers such as time constraints, financial constraints, resource constraints and inaccessibility to the entire population (Quinlan et al. 2015:169). As such, it is recommended that researchers draw a research sample from the research population (Babbie, 2014:119; Sekaran & Bougie 2013: 241). In essence, a research sample refers to a small number of people or items, and the researcher focuses all his or her attention on that small group of people or items whose features will be generalised to give results (Bless, Higson-Smith, & Kagee, 2006:98; Alvi, 2016:9). Stoker (1989) provides sampling guides and indicates that, for a research population between 2800 – 3000, one should select a sample size between 338 – 341. The sample size for this study was 348 drawn from one selected university, with a staff complement of around 2840.

To collect data from 348 respondents, this study employed voluntary response sampling, a non-probability sampling technique (Murairwa, 2015:186). The researcher provided an open invitation to potential university staff to participate at their own will. The formal invitation and participant informed consent form for university staff to participate in the survey was distributed through emails to reach university staff across multiple campuses of University X. From this, university staff volunteered themselves to participate in this study rather than being randomly selected by the researcher.

The application of the voluntary response sampling technique in this study did not use incentives such as cash or prizes to encourage participation in the survey. As supported by Murairwa (2015:189), this approach was chosen to ensure that the results of the survey were not biased and that university staff voluntarily agreed to participate in the survey on their own. The researcher strongly believed that offering incentives would jeopardise the survey results and that incentives would also influence the university staff's decision to participate in the survey. Thus, the use of no incentives helped to eliminate bias in the study while ensuring that the study comprised of true representatives of the population.

The use of the voluntary response sampling technique suited this study for a variety of reasons. Firstly, it was useful in this study as university staff were spread across five campuses enabling them to respond to the online survey without logistical constraints ensuring easier accessibility and wider reach to various staff members (Murairwa, 2015:189). Secondly, the use of a voluntary response sampling technique through an online survey was well suited to this study considering the work-from-home model in SA universities owing to the impact of regular electricity interruptions also known as 'load shedding'. Thirdly, the use of a voluntary

response sampling technique suited this study given that the selected university had implemented a hybrid learning model, which was convenient and further influenced the decision to administer and distribute the survey online. Thus, online data collection allowed for increased flexibility, cost-effectiveness and efficient advantages that made it a feasible and practical option for this study (Lefever, Dal & Matthíasdóttir, 2007:581). In overall, the voluntary response sampling technique was particularly relevant and well suited to this study in view of the current circumstances during data collection at the selected university.

6.9 Data collection instrument

The study relied on self-completed questionnaires for online data collection through Microsoft Forms. According to Microsoft (2024), Microsoft Forms is an online survey, quiz and poll creation tool designed to simplify the processes of creating and distributing surveys as part of Microsoft 365 suite. It is a valuable online tool for individuals, small businesses, schools and government organisations. Self-completed questionnaires collected objective and numerical data on the use of e-health tools in delivering DMHS sustainably in a selected university. The usefulness and efficacy of questionnaires in research studies lie in their ability to uphold ethical considerations which contributes to higher response rates (Bless et al. 2006:44). Furthermore, questionnaires are generally cheaper and quicker to administer and distribute to the respondents (Bryman & Bell, 2011: 192).

The questionnaire design was informed by theoretical insights from the literature review, research questions and objectives, to support drawing meaningful conclusions. The data collection instrument adopted in this research was uniform and consistent for all the respondents. The development and design of the questionnaire also considered the language and attractive layout to enhance response rates. It also provided options and choices for the respondents and clear instructions on how to respond. The idea was to make the questionnaire clear, easy to understand and objective as recommended by other scholars (Bryman & Bell, 2011: 195). The questionnaire was designed with clear instructions and objectively worded statements to ensure it was user-friendly and effective, to enable respondents to answer accurately and reflect their opinions.

A cover letter accompanied the research questionnaire, providing a brief overview of the research area, research objectives, researcher's qualifications, and the university at which the researcher was enrolled. The questionnaire also included a personal request from the researcher encouraging respondents to complete all sections of the questionnaire honestly and openly. Furthermore, the questionnaire included information about the selected university's ethical clearance and authorisation to conduct the investigation. The questionnaire

also provided contact details for requests and queries that respondents could have. The questionnaire further provided instructions to respondents on how they should respond to questions and statements. The questionnaire was distributed electronically due to the fact that some of the university staff were working from home given the use of the hybrid model implemented at the time of data collection. The respondents were also informed that study results would only be returned to the researcher. Prior to data collection, the researcher sought permission and further made arrangements with University X concerning the electronic distribution of the questionnaires.

The online questionnaire was a self-completion research tool, allowing respondents to complete it in their own time without support, thereby preventing bias (Du Plooy, 2009). The questionnaire included a 5-point Likert scale where the rating was 1–strongly agree, 2–agree, 3–neutral, 4–disagree, and 5–strongly disagree.

A pilot study was carried out prior to data collection to ensure the validity and reliability of the research instrument, as highlighted by Bayat and Fox (2007:102). The two authors emphasize the importance of pilot studies in guaranteeing the reliability, trustworthiness, and consistency of data collection. To determine content validity, the items in the questionnaire were generated from a complete literature study on the usage of e-health technologies for DMHS (Bryman & Bell, 2011: 272). This ensured questionnaire items contained relevant information for data collection. The pilot study comprised 18 non-respondents who were purposively selected from the selected university. The non-respondents to the main study provided valuable suggestions and recommendations for the questionnaire development. This was particularly on the structure, design style, layout, font size, observing the time to complete the questionnaire and presentation of statements, the accuracy of information and suitability of questions used in the questionnaire, thus improving the face and construct validity of the questionnaire (Quinlan et al. 2015:274; Bless et al. 2006:160). From this, it is evident that the non-respondents provided valuable insights into the questionnaire construction and design.

The questionnaire was also checked by the research supervisor before being submitted to a qualified and experienced statistician for questionnaire construction. Engaging the statistician allowed the development of well-designed statements that captured the necessary information and minimised bias. Furthermore, the questionnaire was reviewed by two scientific reviewers from the designated academic of the Department of Human Resource Management before it was submitted to the Faculty Research Ethics Committee. The Faculty Research Ethics Committee provided an approval letter indicating that the researcher can collect data. See Appendix A – Ethical Clearance Certificate. The data collection instrument was organised into five distinct sections, each focusing on the following:

Section A: This section collected biographic data of the respondents, such as race, gender, age, level of qualification, employment type, and length of service at the present institution. Collecting biographical data in this study served the purpose of facilitating the generalisation of data gathered in other sections of the questionnaire. This section comprised of 7 statements.

Section B: This section obtained data on the current state of the adoption of e-health tools at the selected university. This was important as it helped to analyse the current state in relation to the adoption or non-adoption of e-health tools in delivering DMHS at the selected university. This section comprised of 9 statements.

Section C: This section collected data relating to the respondent's experiences during the COVID-19 pandemic and how this influences the future sustainable adoption of e-health tools in delivering DMHS. This was essential as it helped the researcher to understand the future sustainable adoption of e-health tools in delivering DMHS. This section comprised of 9 statements.

Section D: This section collected the respondents' perceptions and attitudes regarding factors that influence the sustainable adoption of e-health tools. This was essential because it aided in the investigation by highlighting factors that impact the sustainable adoption of e-health tools. This section comprised of 17 statements.

Section E: This section collected data about participants' knowledge of the strategies that should guide the sustainable adoption of e-health tools at the selected university to deliver mental health services. This section comprised of 14 statements.

6.10 Reliability test

Shrestha (2021:4) highlights the need for post-EFA through reliability and validity tests to confirm the internal consistency and stability of underlying factors. Thus, reliability and validity tests were undertaken as a necessary process to support the development of a robust measurement model in this study. In research, reliability pertains to how consistent measurement is across repeated use (Pietersen & Maree, 2019:260). The definition implies that reliability is an indication of the internal consistency of a measure, the dependability of the research study, and the likelihood of replicating similar outcomes. Quinlan et al. (2015:112) elaborate further by emphasising that the primary purpose of conducting a reliability test is to maintain consistency and stability in the research findings and reduce the occurrence of errors and biases, which is precisely what the researcher sought to achieve in this research. In SEM, Cronbach's Alpha and Composite Reliability (CR) are key measures of assessing the reliability

constructs. Therefore, in this research study, the reliability of the measures was determined by employing these two distinct methodologies as explained below:

Cronbach's Alpha is a widely used measure of internal consistency and it assesses how multiple scale items are correlated (Quinlan et al. 2015:274). In other words, it assesses how well items within a scale measure the same underlying construct. Cronbach's Alpha coefficient values range from 0 to 1, where higher values indicate greater internal consistency. Guided by the recommendations of Hair, Ortinau and Harrison (2021:178), a Cronbach's Alpha coefficient value of 0.7 was adopted as a criterion for determining the reliability of the factors in this study. However, values greater than 0.6 can be accepted in the case of EFA.

Composite reliability (CR) test is also another statistical measure applied in the context of SEM to assess the reliability of a latent construct consisting of numerous observable variables (indicators) (Thakkar, 2020:5). It is valuable in measuring how well the indicators reliably measure the underlying construct. CR values vary from 0 to 1 and, a higher CR value suggests a good reliability of the latent construct and is more internally consistent. Following the guidelines recommended by Hair, Black, Babin and Anderson (2019:775), a CR value of 0.7 or higher was established in this study as the criterion or cut-off point for determining the reliability of the constructs.

6.11 Validity test

Apart from the reliability test, the research instrument also underwent a validity test to ensure that it accurately captured the intended constructs, thus enhancing the research study findings' credibility and robustness (Bryman & Bell, 2011:385). The validity of the factors was analysed using convergent and discriminant validity. Discriminant validity assesses how distinct variables are from one another, while convergent validity examines shared meaning in the theoretical variables (Quinlan et al. 2015:116).

Following the guidelines recommended by Hair et al. (2019:663), an average variance extracted (AVE) value of 0.5 or higher was established as the criterion or cut-off point for determining the convergent validity of the factors in this study. AVE measures the amount of variance attributed to a construct compared to the variance resulting from a measurement error (Shrestha (2021:5). It reflects how well a latent construct's indicators represent the underlying construct and it is an important indicator of convergent validity. AVE values range from 0 to 1, where a value of AVE equal to or more than 0.5 shows good convergence validity, which means that the latent constructs explain more than half of the variance in the indicators.

The Fornell-Larcker criterion (1981) was employed in the current study to assess discriminant validity. The Fornell-Larcker criterion (1981) compares the AVE of each construct with the squared correlations (R2) between the constructs. For discriminant validity to be established, the square root of each construct's AVE should be greater than its highest correlation with any other construct (Fornell-Larcker criterion, 1981). Thus, by meeting the Fornell-Larcker criterion, this study provides evidence for its discriminant validity.

6.12 Research time horizons

Saunders, Lewis and Thornhill (2009:155) assert that researchers should determine whether they wish to conduct a cross-sectional study, which is conducted at a specific time, or whether they wish to collect a series of longitudinal studies that represent events over a specific period. This study adopted a cross-sectional approach, focusing on data collection at a specific point in time. Thus, study findings are reflective of circumstances at a single point in time, rather than indicative of long-term trends or changes in the sustainable adoption of e-health tools for delivering DMHS. However, cross-sectional approach has the potential for common method bias. Data was collected for this study during the period June 2023 to August 2023 in specific months.

6.13 Data collection procedure

The researcher administered and distributed questionnaires online, and no field workers were involved. However, an online data collection tool (Microsoft Forms) was utilised to administer and distribute the questionnaires online to the respondents. Administering and distributing questionnaires online is cheaper and faster than postal questionnaires and includes an attractive format (Bryman & Bell, 2011:220). Since the researcher did not have the prospective respondents' contact email addresses, the researcher contacted the Department heads and made arrangements to distribute the link to the Microsoft Forms to the prospective respondents. This implies that Department heads were requested to distribute the questionnaire link to their relevant staff members through email. The formal invitation and participant informed consent form for voluntary participation were accompanied by an overview of the study's background. When respondents received the email with the link, the online data collection tool (Microsoft Forms) automatically gave them access to complete the online questionnaire in their spare time. After one week of sending an invitational email to complete the online questionnaire, a reminder email was sent to prospective respondents to encourage them to complete the online questionnaire through the department heads. Thus, the response rate was significantly increased by the follow-up emails, resulting in a higher completion rate.

6.14 Data analysis

According to Cooper and Schindler (2011:90), data analysis is “the process of reducing large amounts of collected data into meaningful and manageable portions, developing summary measures, observing patterns, relationships, and trends, and employing statistical techniques if any to interpret and extract valuable insights from the data that eventually address the research problem”. It is from this perspective that effective data analysis represents the cornerstone that transforms primary data into meaningful knowledge, thereby allowing the foundation upon which informed conclusions are drawn and contributions to the field of academic research are made.

Prior to data analysis, the data collected through Microsoft Forms was thoroughly checked for completeness and accuracy. Thereafter, the research study adopted a two-step process for statistical data analysis, employing both SPSS and AMOS, statistical software packages that are widely used for data analysis in social science research. The first step involved utilising SPSS for frequency distributions and descriptive statistics. This step extended to EFA to identify underlying factors. The second step involved the application of AMOS, a software specifically developed for SEM. Consultation with a qualified and experienced statistician was made during data analysis to better analyse and interpret the data collected. See Appendix C – Statistical Analysis Certificate attached. The study utilised the following statistical techniques to analyse data:

6.14.1 Frequency distribution

The research study employed frequency distribution to summarise and describe the demographic information in a simple and interpretable manner (Quinlan et al. 2015:360). This approach effectively presented the data in a clear, concise and visual way, enabling readers to quickly understand the distribution of respondents across various categories. Accordingly, this approach was particularly valuable in understanding the demographic information of the respondents.

6.14.2 Descriptive statistics

Descriptive statistics were utilised to summarise and elucidate key features and characteristics of the data including measures of central tendencies and variability of the observed values (Zikmund, Babin, Carr & Griffin, 2009:651). The study utilised the mean values to compute the measures of central tendency. Moreover, standard deviation (SD) was utilised to measure how data was spread around the mean value. In overall, descriptive statistics facilitated a better understanding of complex data by enabling comparisons between variables within

datasets, leading to a more thorough interpretation and conclusions drawn from the research findings.

6.14.3 EFA

The study further employed EFA to identify underlying factors (Hair et al. 2014:92). Principal axis factoring was employed to identify underlying factors in this study and the primary reason was to reveal underlying factors and understand the relationships between observed variables. Through this process, underlying factors were revealed, which are underlying concepts that are not directly observable (DeVellis, 2017:155).

In consideration of the fact that this research study generated large datasets with numerous variables, EFA was also employed to reduce the complex data. The reduction included the grouping of related variables into smaller and more manageable factors, thus helping to clarify the total variance explained among the factors. Recognising that factors may be interconnected, the study utilised the Promax rotation technique with Kaiser Normalisation, an oblique rotation method, for EFA to capture potential correlations between them (Burns & Burns, 2008:449). As DeVellis (2017:155) notes, the reduction of data allowed for complex data to be understood thereby facilitating a more manageable data analysis which further improved the interpretability of factors.

Prior to undertaking EFA, the study adhered to established practices by performing two tests: sampling adequacy and data suitability. In the first test, Kaiser-Meyer-Olkin (KMO) was performed to measure sampling adequacy, and a commonly cited guideline suggests a KMO value above 0.5 to advance with EFA (Hair et al. 2014:92). In the second test, Bartlett's Test of Sphericity was performed to assess whether the variables in the dataset are correlated and, therefore determine data suitability for EFA. A commonly cited guideline suggests a *p*-value less than 0.05 to be considered significant, indicating that the variables have no association with one another (Burns & Burns, 2008:456).

6.14.4 CFA

CFA was used to validate the factor structure from EFA. To put it another way, the CFA was conducted to determine whether the proposed measurement model, including the factor structure, was coherent with the observed data. Thakkar (2020:6) suggests that it is useful to apply CFA when the measurement model has a well-developed underlying theoretical basis, which is precisely the main reason why CFA was preferred and more appropriate in this study.

Farooq (2016:80) contends that SEM provides various statistical measures of the fit between the conceptual framework and the observed data. This statement implies that SEM provides various statistical measures such as goodness-of-fit that measures the compatibility of the data on how well the conceptual framework matches the actual data. Therefore, the goodness-of-fit indices measures are important because they provide key insights on whether the conceptual model is aligned with the observed data, which ultimately strengthens the credibility and validity of the study findings. In this study, this process was important in evaluating the overall suitability, validity and generalisability of the framework model, thus making it more reliable and robust.

Following the guidelines recommended by Xia and Yang (2019:410) and Heene, Hilbert, Draxler, Ziegler and Bühner (2011:320) and Dash and Paul (2021:2), the following goodness of fit indices explained below are the statistical measurements used in this research study to confirm how well the proposed conceptual framework model aligned with the observed data. This is followed by Table 6.1 which provides a summary of model fit indices used to confirm the measurement of the factor structure.

- **CMIN/df or χ^2/df:** The CMIN/df also known as χ^2/df refers to the minimum discrepancy divided by degrees of freedom. It is a fit index used in SEM to assess how well a hypothesised model fits the data. CMIM (minimum discrepancy) denotes the chi-square statistic which quantifies the variance between the observed and expected data (Sharpe, 2015:1). The degree of freedom (df) represents the number of restrictions placed on the data by the model. According to Dash and Paul (2021:2), “CMIN/df value of 3 or less is considered a good model fit measure”. Accordingly, a CMIN/df value of 3 or less than was considered an acceptable fit for this study.

- **Comparative fit index (CFI):** The CFI measures how well the proposed conceptual framework model fits in comparison to a null model, and this is often a model with no correlations between the variables (Xia & Yang, 2019:409). The CFI value ranges from 0 to 1 and a higher value indicates a better fit. In this study, a CFI value greater than 0.90 was considered an acceptable value in indicating a good fit.

- **Root mean square error of approximation (RMSEA):** Xia and Yang (2019:409) consider RMSEA as “a robust index of model fit as it does not depend on the sample size such as chi-square does, and it is an absolute fit indicator that assesses how far a hypothesised model is from a perfect one”. In this research study, an RMSEA value of 0.08 or less was considered an acceptable value in indicating a good fit.

- **Standardised root mean square residual (SRMR):** Heene et al. (2011:320) describe SRMR as the variation between observed and predicted relationships in the conceptual framework model. From this definition, SRMR thus serves as an overall model fit indicator. SRMR values closer to 0 indicate a good fit and in this research study, values below 0.08 were considered acceptable.

Table 6.1: Goodness of fit indices

Fit index	Recommended thresholds	Interpretation
CMIN/df	< 3.00	Good fit
Root mean square error of approximation (RMSEA)	< 0.08	Good fit
Comparative fit index (CFI)	> 0.90	Good fit
Standardised root mean square residual (SRMR)	< 0.08	Good fit

Source: Author's own creation based on the literature review

6.14.5 SEM

SEM was employed for advanced data analysis to analyse complex relationships among the variables of the study within the proposed conceptual framework model. As an advanced statistical technique, SEM facilitated the simultaneous investigation of multiple variables of the study which allowed for an in-depth understanding of the sustainable adoption of e-health tools in delivering DMHS at the selected SA university (Thakkar, 2020:1-2).

The application of SEM also extended to hypothesis testing, an important step in improving and validating the conceptual framework. As supported by Farooq (2016:85), SEM helped determine the statistical significance of relationships and validate the conceptual framework. Through the evaluation of the evidence supporting these hypotheses, the study validated and refined the conceptual framework for the sustainable adoption of e-health tools in delivering mental health services at a selected SA university. Consequently, this step improved its explanatory power and predictive accuracy (Evermann & Tate, 2016: 4566).

6.15 Ethical considerations

The following ethical considerations were rigorously upheld throughout the study:

6.15.1 Permission to conduct study

The study received ethical clearance from the Faculty Research Ethics Committee (Faculty Ethics Committee Approval Reference Number: 2021_FBMSREC 083 – see Appendix A). Immediately after obtaining the appropriate permission from the selected university, the researcher began data collection.

6.15.2 Voluntary participation

Respondents were provided with background information on the research study, including its main purpose and objectives. Moreover, involvement in the study was totally voluntary, with acceptance confirmed by a signed consent form.

6.15.3 Anonymity and confidentiality

In this research study, respondents' personal and sensitive information was safeguarded. The study did not disclose the respondents' details including their identities and location. Respondents remained anonymous throughout the study and no confidential information was published or documented. During fieldwork, the study did not violate any human and legal rights of the respondents. All data obtained from respondents was kept strictly safe and secure. The following precautionary measures were adopted to protect the respondents' privacy:

- During online data collection, respondents were never compelled to give their identities or names and surnames.
- When the study was completed, the respondents' responses were stored at a protected facility and electronically at the researcher's private residence to ensure confidentiality.

6.15.4 Avoiding harm to respondents

When conducting studies, researchers need to be aware of different harm that may be caused in the form of physical, psychological, emotional, social and financial means (Babbie & Mouton, 2001:522). Therefore, this study was conducted in a way that no respondents were deliberately or accidentally harmed. The study did not disclose any information that had the potential to endanger or humiliate respondents either implicitly or explicitly. In addition, there was no obligation to participate in this study, indicating that it was voluntary and that respondents could discontinue at any moment without providing reasons as suggested by previous scholars (Bless et al. 2006:143). The researcher offered clarification throughout the

research for respondents. In addition, the study ensured inclusivity and treated all respondents with equal respect.

6.15.5 Honesty in presenting study findings

The researcher conducted this study with complete honesty and accuracy. There was no falsification of the study findings when they were presented.

6.15.6 Data management plan

The researcher submitted the whole thesis as well as all datasets that were generated throughout this investigation to the Cape Peninsula University of Technology library for graduation reasons. This was consistent with the newly implemented Cape Peninsula University of Technology research data management policy and practices. However, no sensitive information was shared.

6.16 Summary

This chapter outlined the research methodology, which combined a case study of a single university with a survey research design. Thereafter, quantitative research approaches were utilised within a positivist research paradigm. A deductive research approach was employed where hypotheses were developed and empirically tested. Afterwards, non-probability sampling techniques were utilised to select the 348 sample from the target population. Online data collection methods were employed to collect data, and this involved the administering and distribution of questionnaires through Microsoft Forms. Data collected were processed by means of SPSS version 29, and AMOS version 28. Data analysis involved frequency distribution, descriptive statistics, EFA, CFA, and SEM. The chapter concluded with an in-depth discussion of ethical considerations pertaining to this research study. The next chapter presents the research findings.

CHAPTER SEVEN

PRESENTATION OF RESEARCH FINDINGS

7.1 Introduction

This chapter presents the research findings on the sustainable adoption of e-health tools in delivering DMHS at a selected SA university. The findings are presented in great detail and the research study makes use of tables and other forms of data presentation. To present quantitative data, the research study commences with the frequency distribution of the respondents' demographic information. This is followed by the presentation of the descriptive statistics which assists in explaining the measures of central tendencies and variability of the observed values in the study. Afterwards, findings from EFA are presented to uncover factor structure within the data and thereby allowing for the identification of essential factors related to the sustainable adoption of e-health tools. Subsequently, an examination of the internal consistency and stability of the identified factors is performed following the EFA. Thereafter, CFA findings are presented which discuss model fit assessments and provide key insights into the alignment of the proposed conceptual framework with the observed data. A presentation and in-depth analysis of SEM model fit results are presented to explain how well the model captures relationships and overall fitness. Hypothesis testing follows to assess the statistical significance of the relationships among the study's variables, helping to draw conclusions from the data.

7.2 Frequency distribution of the respondents' demographic information

In this study, demographic data was essential to enhance the generalisability of the research findings and section A of the questionnaire required respondents to indicate their gender, race, age group, highest level of qualification achieved, occupation, employment category, and length of service at the current institution. Below is the frequency distribution of the respondents' demographic information.

7.2.1 Gender of respondents

Figure 7.1 depicts the gender of the respondents who participated in the study. Out of a total of 348 respondents, 55.2% (N=192) were females and 44.8% (N=156) were males.

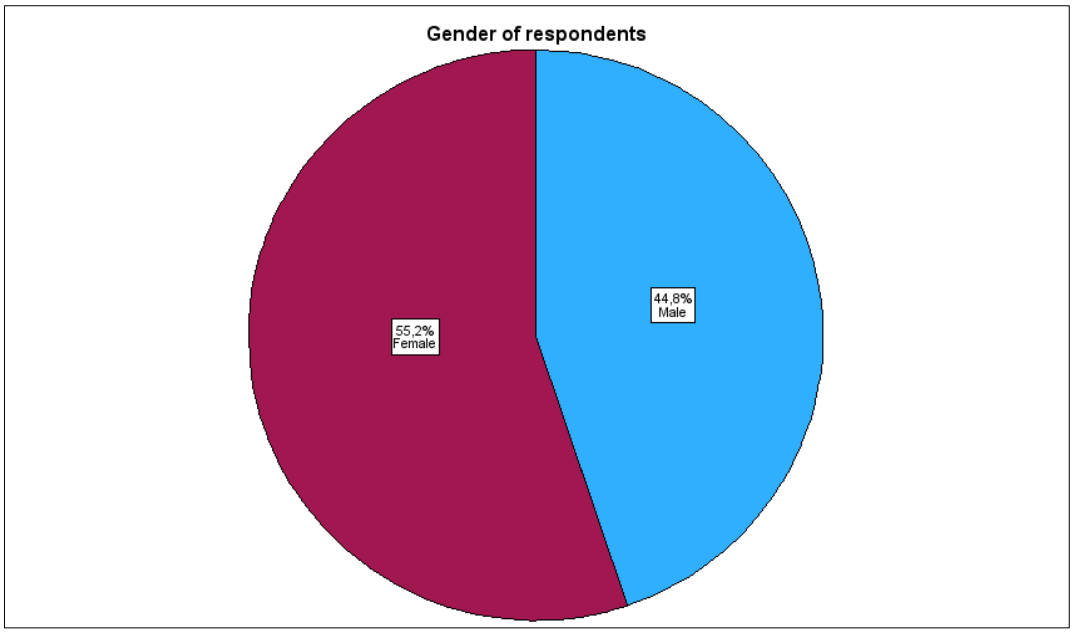


Figure 7.1: Gender of respondents

7.2.2 Race of respondents

A five-group racial classification was used in this research study: Black, White, Coloured, Indian, and Asian. Figure 7.2 below illustrates that 46.3% of the respondents were of African descent, 25.6% were of Coloured descent, 14.7% were of Indian descent, 12.6% were of White descent, and 0.8% were of Asian origin.

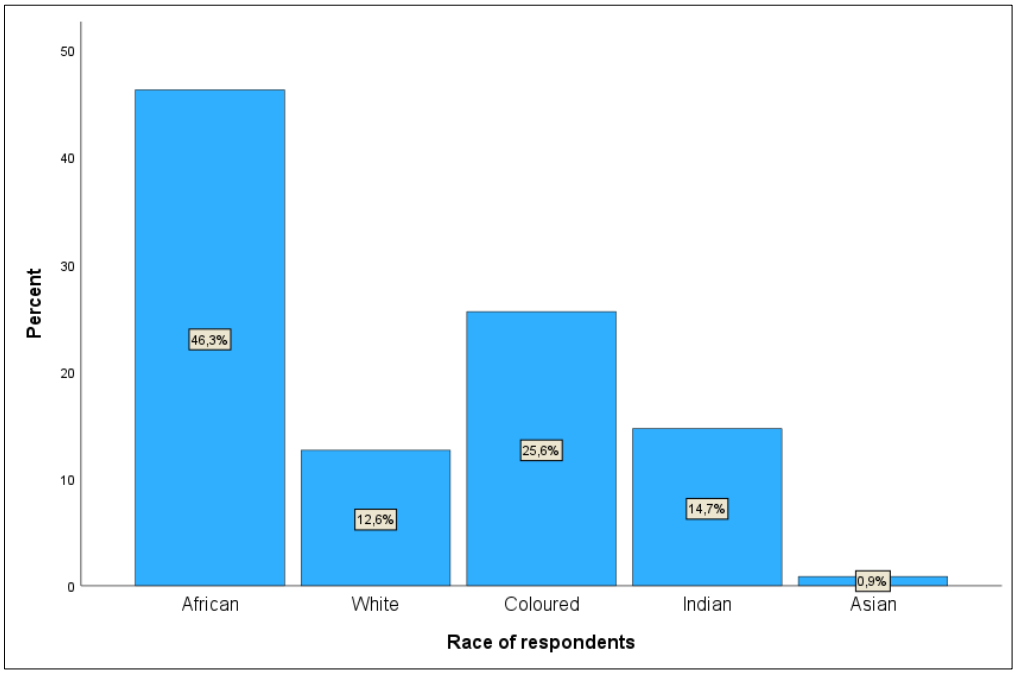


Figure 7.2: Race group distribution of respondents

7.2.3 Age group of respondents

Figure 7.3 illustrates that the majority of respondents (42.8%) were in the 40 – 49 years old age group, followed by (26.7%), in the 50 – 59 years old, (23.9%) were in the age group between 30 – 39 years old, (3.7%) were aged 60 years and older respondents and lastly 2.9% were in the of 20 – 29 years old.

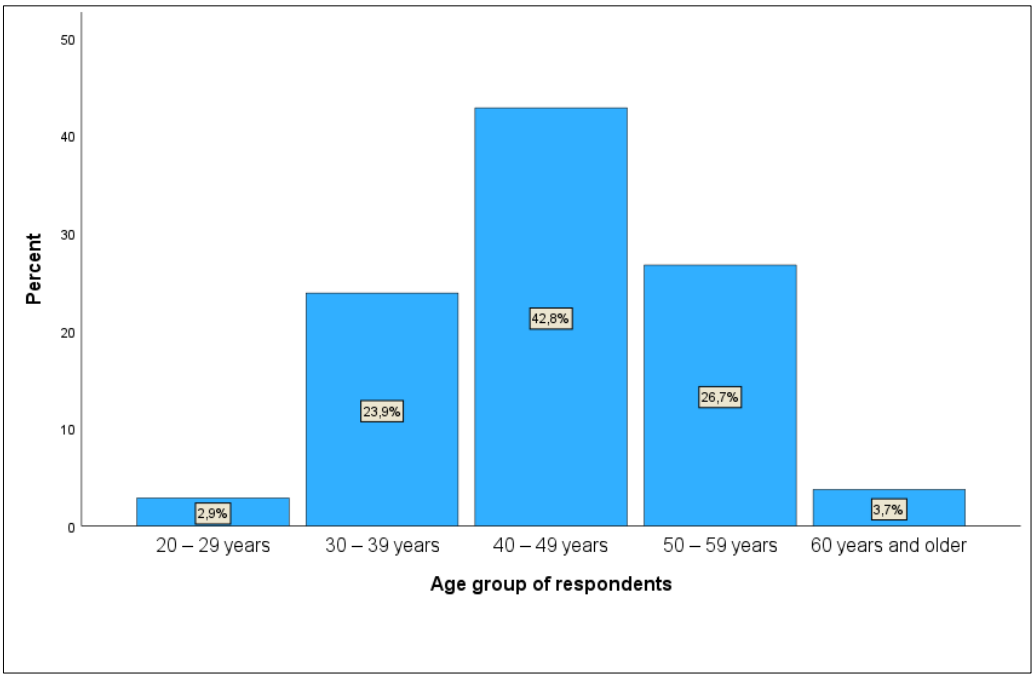


Figure 7.3: Age distribution of respondents

7.2.4 Highest level of qualification attained by respondents

The research study considered the highest level of qualification attained by respondents including relation to the National Senior Certificate, Diploma, undergraduate degree, postgraduate degree, master's degree, and doctoral degree and other qualifications for those who did not fit into these specified categories defined. As shown in Figure 7.4, the majority (51.7%) of respondents stated that a master's degree was their highest level of qualification. This was followed by 18.1% of respondents who indicated that a doctoral degree was the highest level of qualification they had attained, 13.5% of the respondents indicated that an undergraduate degree was the highest qualification they had attained, 11.2% had attained a postgraduate degree qualification attained, 4.6% of the respondents had a diploma as their highest qualification. 0.6% indicated the National Senior certificate as their highest qualification attained and lastly, 0.3% indicated other qualifications as their highest level of qualification attained.

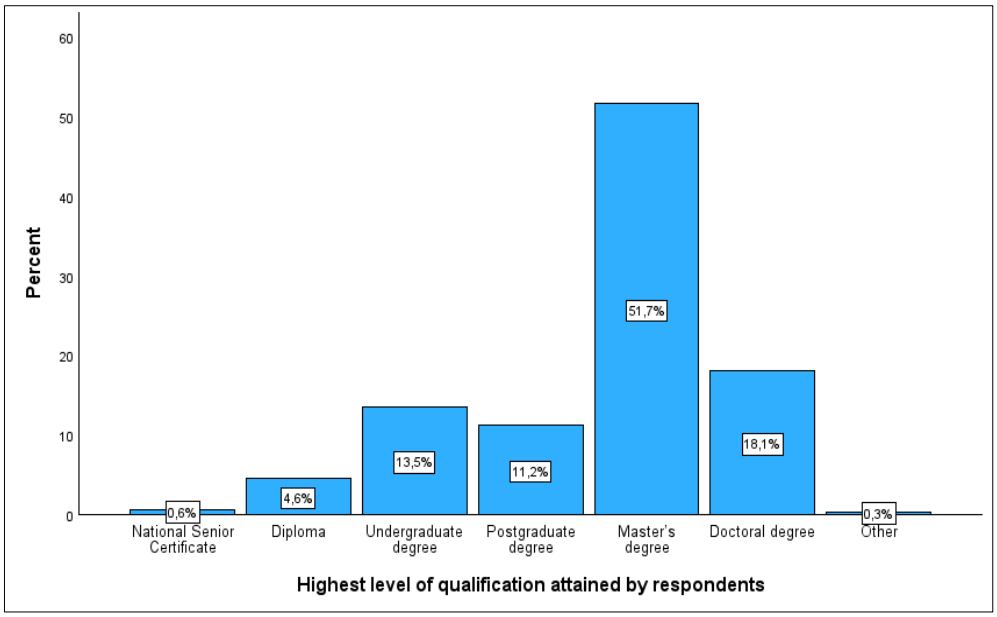


Figure 7.4: Highest level of qualification attained by respondents

7.2.5 Occupation of respondents

As shown in Figure 7.5 below, the majority of respondents (58.9%) were academic staff. A total of 35.6% of the respondents who took part in this study were non-academic staff (support staff). Management staff who participated in this study comprised 5.3%.

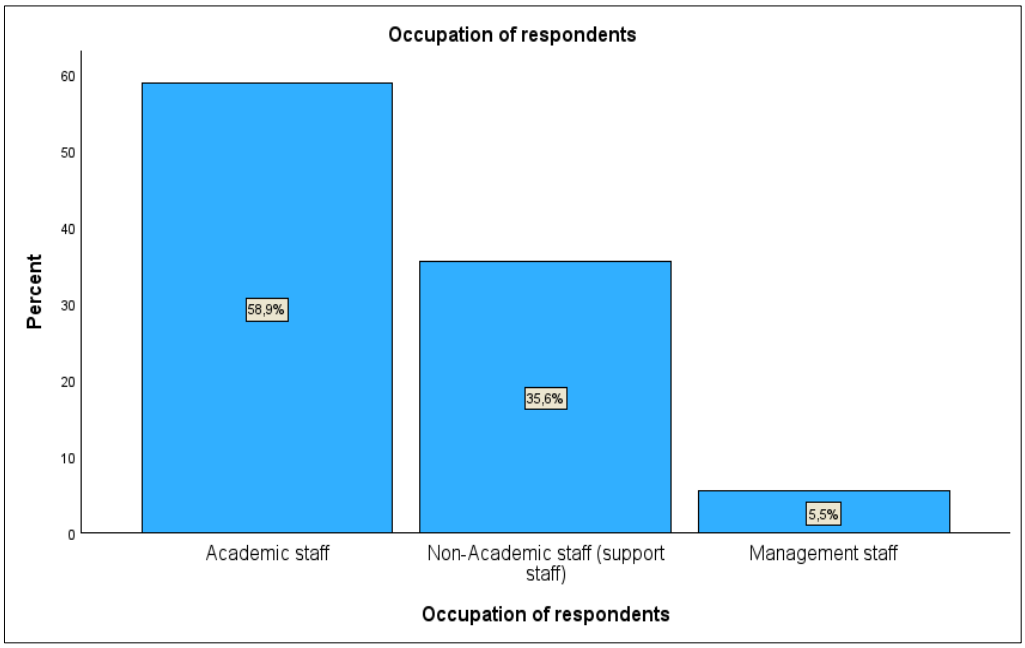


Figure 7.5: Occupation of respondents

7.2.6 Employment category of respondents

Figure 7.6 shows that a majority (65.9%) of respondents were employed on permanent contracts, while 30.5% were employed on fixed-term contracts.

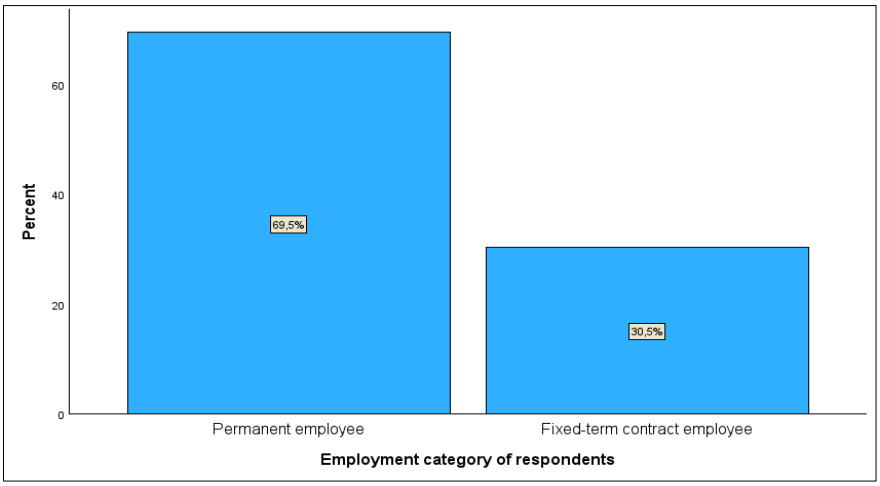


Figure 7.6: Employment category of respondents

7.2.7 Length of service at the current institution

Figure 7.7 illustrates that 29.6% of the respondents had been with their current institution for 6 – 10 years. This was followed by 21.8% and 21.3% who had been working for their respective institution for between 16 – 20 years and 0 – 5 years respectively. In addition, 19.3% indicated that they had been with their current institution between 11 – 15 years, whilst 8.0% had been working for more than 21 years.

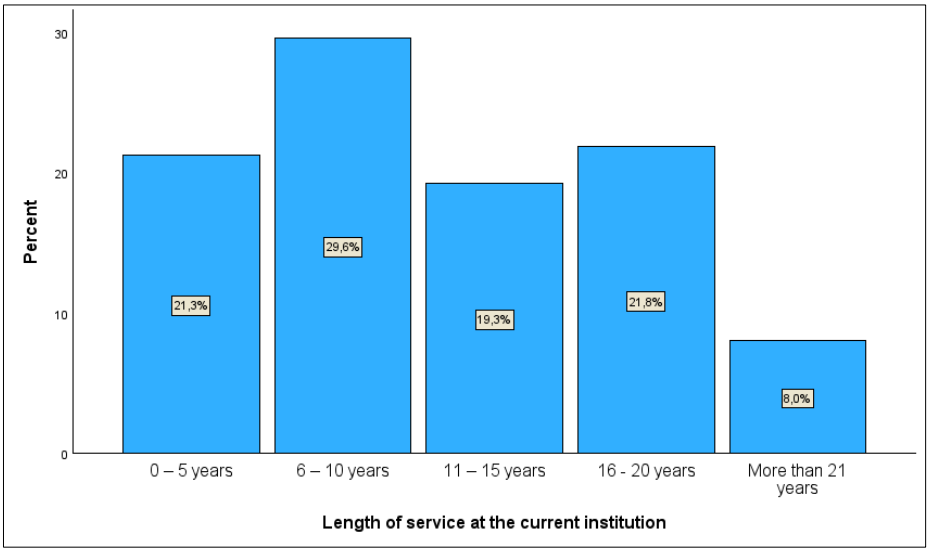


Figure 7.7: Employment category of respondents

7.3 Findings of the descriptive statistics

Arithmetic mean, often referred to as a 'mean' value was used to calculate the central tendency, reflecting the average respondents' perception (Bryman & Bell, 2011:319). Since the volume of data from the 49 research instrument statements was so large, descriptive statistics explanations mainly focused on the lowest and highest means instead of covering all items reflected in the descriptive tables. In this study, a lower mean value indicated that respondents strongly agree, and a higher mean value indicated the opposite, considering that the research instrument (Likert scale) ranged from (1) strongly agree to (5) strongly disagree. Table 7.1 shows the descriptive statistics for the current state of the adoption of e-health tools.

Table 7.1: Descriptive statistics for the current state of the adoption of e-health tools

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Current state 1	348	1	5	1.97	1.427
Current state 2	348	1	5	2.20	1.475
Current state 3	348	1	5	1.52	.976
Current state 4	348	1	5	1.74	1.237
Current state 5	348	1	5	2.58	1.483
Current state 6	348	1	5	3.46	1.484
Current state 7	348	1	5	3.29	1.664
Current state 8	348	1	5	3.49	1.590
Current state 9	348	1	5	1.92	1.296
Valid N (listwise)	348				

As presented above, Table 7.1 shows descriptive statistics for Section B of the questionnaire – the current state of adoption of e-health tools. Current state 3 shows that the item "I regularly utilise multiple devices (such as smartphones, laptops, desktop computers, and tablets) to connect to the internet" had the lowest mean of 1.52 and a SD of 0.976 indicating that the values are spread out by an average of 0.976 around the mean. In light of the fact that the mean of 1.52 was close to 1 (strongly agree), the low mean suggests a high level of agreement with the statement among the respondents. This reflects that, on average, respondents tend to strongly agree that they regularly utilise multiple devices to connect to the internet.

Current state 8 shows that the item "I am aware of the fourth industrial revolution (4IR) technologies for DMHS" had a mean of 3.49 and a SD of 1.590. The mean of 3.49 (4 –

disagree) suggests that respondents were mostly unaware of the fourth industrial revolution (4IR) technologies used in DMHS.

Table 7.2: Descriptive statistics for the experiences gained during the COVID-19 pandemic

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Experience gained 1	348	1	5	1.69	1.010
Experience gained 2	348	1	5	1.77	1.103
Experience gained 3	348	1	5	2.02	1.260
Experience gained 4	348	1	5	2.26	1.365
Experience gained 5	348	1	5	2.66	1.504
Experience gained 6	348	1	5	1.74	1.089
Experience gained 7	348	1	5	3.21	1.432
Experience gained 8	348	1	5	3.23	1.524
Experience gained 9	348	1	5	2.03	1.238
Valid N (listwise)	348				

Table 7.2 above presents descriptive statistics for experiences gained during the COVID-19 pandemic. Experience gained 1 shows that item “during the COVID-19 pandemic, it was beneficial to use e-health tools to access mental health services digitally” had the lowest mean of 1.69 and SD of 1.010. However, since a mean of 1.69 was close to 1 (strongly agree), it is evident that respondents found it beneficial to use e-health tools to access mental health services digitally during the COVID-19 pandemic.

Experience gained 8 shows that item “during COVID-19, my decision not to use e-health tools was not influenced at all by the absence of a legal framework in SA” had a mean of 3.23 and SD of 1.524. As a result, based on a mean of 3.23, it shows that most respondents were neutral when asked whether the absence of a legislative framework in SA influenced their decision not to utilise e-health tools during COVID-19.

Table 7.3: Descriptive statistics for factors that influence the sustainable adoption of e-health tools

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Factor 1	348	1	5	1.67	.982
Factor 2	348	1	5	1.82	1.087
Factor 3	348	1	5	1.99	1.134
Factor 4	348	1	5	1.81	1.117
Factor 5	348	1	5	1.83	1.112
Factor 6	348	1	5	1.92	1.172
Factor 7	348	1	5	2.61	1.449
Factor 8	348	1	5	2.18	1.421
Factor 9	348	1	5	2.24	1.452
Factor 10	348	1	5	2.03	1.294
Factor 11	348	1	5	2.29	1.475
Factor 12	348	1	5	2.38	1.515
Factor 13	348	1	5	2.00	1.318
Factor 14	348	1	5	1.95	1,216
Factor 15	348	1	5	2.03	1.214
Factor 16	348	1	5	1.77	1.126
Factor 17	348	1	5	1.60	.965
Valid N (listwise)	348				

Table 7.3 shows the descriptive statistics for section D - factors that influence the sustainable adoption of e-health tools. The descriptive statistics reveal that the Factor 17 item “external support is necessary for our university to deliver DMHS through e-health tools” had the lowest mean of 1.60 and a SD of 0.964. Considering that a mean of 1.60 was close to 1 (strongly agree), the data suggests that most respondents strongly agreed that external support is necessary for their university to deliver DMHS through e-health tools. In other words, this indicated a belief in the importance of external support.

It is also highlighted in Table 7.3 that item Factor 7 “e-health tools for DMHS are complex to adopt in our university” had the highest mean of 2.61 and a SD of 1.449. Therefore, and based on a mean of 2.61, this highlighted that those respondents tend to agree that e-health tools for DMHS are complex to adopt in their university, indicating a perception of complexity.

Table 7.4: Descriptive statistics for strategies that should guide sustainable adoption of e-health tools

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Strategy 1	348	1	5	1.56	.878
Strategy 2	348	1	5	2.33	1.340
Strategy 3	348	1	5	1.83	1.126
Strategy 4	348	1	5	2.07	1.406
Strategy 5	348	1	5	2.19	1.541
Strategy 6	348	1	5	2.09	1.449
Strategy 7	348	1	5	2.21	1.510
Strategy 8	348	1	5	2.27	1.378
Strategy 9	348	1	5	1.87	1.192
Strategy 10	348	1	5	2.07	1.296
Strategy 11	348	1	5	1.86	1.200
Strategy 12	348	1	5	2.26	1.492
Strategy 13	348	1	5	2.07	1.350
Strategy 14	348	1	5	2.23	1.537
Valid N (listwise)	348				

The descriptive statistics for section E of the questionnaire – strategies that should guide sustainable adoption of e-health tools are shown in Table 7.4 above. The data shows that the Strategy 1 item which stated “Increasing partnerships with private and public organisations will help my university use e-health tools for DMHS” had the lowest mean of 1.56 and a SD of 0.878. In view of a mean of 1.56 (close to 1 – strongly agree), it therefore, means that most of the respondents strongly agreed that increasing partnerships with private and public organisations will help their university use e-health tools for DMHS.

The highest mean of 2.33 and SD of 1.340 shown in Table 7.4 was observed for the Strategy 2 item “offering financial incentives to university staff will effectively help to promote and significantly increase the adoption of e-health tools”. This data suggests that most respondents somewhat agreed that offering financial incentives to university staff will effectively help to promote and significantly increase the adoption of e-health tools.

7.4 Findings of the EFA

Having presented the descriptive statistics, the current section shifts to present findings of the EFA. The presentation commences with an assessment of the KMO and Bartlett’s Test of

Sphericity to ascertain the appropriateness of data for EFA. Thereafter, EFA findings are presented to uncover factor structure for the four main constructs: current state of the adoption of e-health tools, experiences gained during the COVID-19 pandemic, factors that influence the sustainable adoption of e-health tools and strategies for their sustainable adoption.

7.4.1 EFA: Current state of the adoption of e-health tools

Table 7.5 below shows that for the current state of the adoption of e-health tools, the KMO resulted in an acceptable 0.631 measure of sampling adequacy. Thus, the result was deemed appropriate for EFA considering that it was higher than 0.5. Moreover, Bartlett's Test of Sphericity was highly significant at $p < 0.001$, further supporting the suitability of the data for EFA.

Table 7.5: KMO and Bartlett's Test for the current state of the adoption of e-health tools

KMO-MSA and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.631
Bartlett's Test of Sphericity	Approx. Chi-Square	403.314
	df	36
	Sig.	<.001

Three factors were initially extracted from the EFA. However, the third factor only included one item, which falls short of the minimum number of items recommended by Hair et al. (2014). The EFA was re-conducted, and two factors were extracted. The resulting factor structure had the appropriate number of items per factor, however, when the second factor was checked for reliability, it was found to be unreliable (α=0.551). In light of this discrepancy, the EFA was reanalysed, extracting only one factor encompassing out of three items and accounting for 14.831% of the variance. While this value falls below the desired threshold, the factor was retained pending further assessment of its reliability. The researcher retained the single factor because it aligned with prior item groupings and demonstrates acceptable reliability after the removal of problematic items that caused low reliability in the two-factor model (Hair et al. 2014). The factors were extracted using Principal axis factoring. Upon careful review of the items and in alignment with the previous groupings, the factor was labelled as the "current state of adoption" of e-health tools. Table 7.6 presents the detailed factor structure, while the table thereafter (Table 7.7) displays the total variance explained by the extracted factors for the current state of adoption of e-health tools.

Table 7.6: Factor structure for the current state of adoption

Factor Matrixa	
	Factor
I have stable access to internet at home.	
I am concerned about the internet cost when using e-health tools to access digital health services.	
I regularly utilise multiple devices (such as smartphones, laptops, desktop computer, and tablets) to connect to the internet.	
I regularly use social media technologies such as Facebook, Twitter, YouTube, Instagram and WhatsApp.	
I regularly search for DMHS on the internet.	
Our university offers DMHS for free.	0.628
I am aware of different DMHS offered for free by Higher Health, SA Depression and Anxiety Group (SADAG) as well as Momentum Wellness.	0.661
I am aware of the fourth industrial revolution (4IR) technologies for DMHS.	0.524
I prefer DMHS delivered via e-health tools over traditional in-person mental health services.	
Extraction Method: Principal Axis Factoring.	
a 1 factors extracted. 12 iterations required.	

Table 7.7: Total variance explained by extracted factors for the current state of adoption

Total Variance Explained						
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.061	22.897	22.897	1.335	14.831	14.831
2	1.797	19.969	42.866			
3	1.129	12.545	55.412			
4	0.93	10.338	65.75			
5	0.843	9,368	75.117			
6	0.647	7.188	82.305			
7	0.624	6.93	89.235			
8	0.522	5.797	95.032			
9	0.447	4.968	100			
Extraction Method: Principal Axis Factoring.						

7.4.2 EFA: Experiences gained during the COVID-19 pandemic

Table 7.8 demonstrates that for the experiences gained during the COVID-19 pandemic, the KMO resulted in an acceptable 0.727 measure of sampling adequacy. The result was higher than 0.5 and this indicated the appropriateness of the data for EFA. In addition, the Bartlett's Test of Sphericity was highly significant at $p < 0.001$, further supporting the suitability of the data for EFA.

Table 7.8: KMO and Bartlett's Test for the experiences gained during the COVID-19 pandemic

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.727
Bartlett's Test of Sphericity	Approx. Chi-Square	652.302
	df	36
	Sig.	<.001

An EFA was conducted, and it revealed the extraction of three distinct factors. However, factors 2 and 3 each contained only two items which falls below the recommended minimum of two items per factor as suggested by Hair et al. (2014). This discrepancy necessitated a further examination to ensure the stability of the factor structure. As a result, an EFA was reanalysed, extracting 2 factors. Again, the second factor only contained 2 items requiring that the EFA was performed again, extracting a single factor. The single factor extracted accounted for 24.624% variance, which is lower than preferred but was retained in case it would be sufficiently reliable. Factor 1 extracted contained 7 items. The items that formed the factor were reviewed and labelled as "experiences gained during COVID-19".

Table 7.9 below presents the detailed factor structure, while the table thereafter (Table 7.10) displays the total variance explained by the extracted factors for the experiences gained during COVID-19.

Table 7.9: Factor structure for experiences gained during the COVID-19 pandemic

Factor Matrix	
	Factor
	1
During the COVID-19 pandemic, it was beneficial to use e-health tools to access mental health services digitally.	0.655
During COVID-19 pandemic, social media played a significant role for my mental health.	0.607
I was satisfied with the digital mental health care services provided through e-health tools during COVID-19.	0.670
During COVID-19, my university was committed to the use of e-health tools for DMHS.	0.525
During COVID-19, there was a variety of DMHS available at our university.	0.411
In the aftermath of COVID-19, I believe that e-health tools are the effective mode of delivering DMHS at my university.	0.560
During of COVID-19, installing digital mental health applications played a significant role in my mental health.	
During COVID-19, my decision not to use e-health tools was not influenced at all by the absence of a legal framework in SA.	
During COVID-19, I was concerned about ethical guidelines for DMHS.	0.434

Table 7.10: Total variance explained by extracted factors for the current state of adoption

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.878	31.98	31.98	2.216	24.624	24.624
2	1.392	15.469	47.449			
3	1.306	14.509	61.958			
4	0.826	9.175	71.132			
5	0.704	7.818	78.95			
6	0.531	5.902	84.852			
7	0.516	5.737	90.589			
8	0.433	4.815	95.404			
9	0.414	4.596	100			

Extraction Method: Principal Axis Factoring.

7.4.3 EFA: Factors that influence the sustainable adoption of e-health tools

Table 7.11 below demonstrates that for the factors that influence the sustainable adoption of e-health tools, the KMO resulted in an acceptable 0.912 measure of sampling adequacy. The result was higher than 0.5 and this indicated the appropriateness of the data for EFA. In addition, the Bartlett's Test of Sphericity was highly significant at $p < 0.001$, further supporting the suitability of the data for EFA.

Table 7.11: KMO and Bartlett's Test for factors that influence the sustainable adoption of e-health tools

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.912
Bartlett's Test of Sphericity	Approx. Chi-Square	2974.603
	df	136
	Sig.	<.001

After conducting KMO and Bartlett's Test, an EFA analysis was performed, and three distinct factors were extracted accounting for 52.215% cumulative variance. Factor 1 extracted contained 5 items, factor 2 extracted contained 5 items, and factor 3 extracted contained 5 items. The items that formed the three factors were reviewed and labelled as follows:

- Factor 1 – University capacity to deliver DMHS.
- Factor 2 – Perceived benefits and importance of e-health tools.
- Factor 3 – External support to improve university capacity.

Table 7.12 below presents the detailed factor structure, while the table thereafter (Table 7.13) displays the total variance explained by the extracted factors for the factors that influence the sustainable adoption of e-health tools.

Table 7.12: Factor structure for factors that influence the sustainable adoption of e-health tools

Pattern Matrix			
	Factor		
	1	2	3
Using e-health tools can provide me with convenient and timely access to useful DMHS.		0.693	
Using e-health tools can provide me with a broader and wider variety of DMHS than traditional face-to-face services.		0.783	
Using e-health tools for DMHS is generally user-friendly.		0.799	
I have a positive feeling towards the use of e-health tools for DMHS.		0.586	
In the future, I plan to use e-health tools for my mental health more regularly even if they are not mandatory.		0.601	
E-health tools for DMHS are compatible with our university's existing ICT Infrastructure.			
E-health tools for DMHS are complex to adopt in our university.			
Top management at our institution is likely to be interested in supporting the adoption of e-health tools for DMHS.	0.699		
Our university is likely to have the financial resources to support the delivery of DMHS.	0.801		
Our university is able to source financial resources required to deliver DMHS at our institution.	0.735		
Our university has the relevant ICT knowledge to deliver DMHS.	0.791		
If I face any technical issue using e-health tools for DMHS, technical support is available to help in our university.	0.746		
The size of our university can enable our institution to deliver DMHS through e-health tools.			0.612
Our university has the government support to help our institution to deliver DMHS through e-health tools.			0.849
Current SA government policies and regulations support our university to use e-health tools for DMHS.			0.650
It is important for our university to deliver DMHS through e-health tools to remain competitive.			0.580
External support is necessary for our university to deliver DMHS through e-health tools.			0.573

Table 7.13: Total variance explained by extracted factors for the factors that influence the sustainable adoption of e-health tools

Total Variance Explained							
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadingsa
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.252	42.658	42.658	6.812	40.072	40.072	5.312
2	1.911	11.242	53.9	1.476	8.684	48.755	5.047
3	1.08	6.353	60.253	0.588	3.459	52.215	5.605
4	0.942	5.543	65.796				
5	0.773	4.548	70.344				
6	0.706	4,151	74.495				
7	0.603	3.546	78.04				
8	0.576	3.391	81.431				
9	0.494	2.906	84.338				
10	0.464	2.73	87.068				
11	0.428	2.519	89.587				
12	0,365	2.146	91.733				
13	0.336	1.975	93.708				
14	0.3	1.762	95.47				
15	0.285	1.674	97.145				
16	0.26	1.532	98.676				
17	0.225	1.324	100				

Extraction Method: Principal Axis Factoring.

When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

7.4.4 EFA: Strategies for the sustainable adoption of e-health tools

Table 7.14 shows that for the strategies for the sustainable adoption of e-health tools, the KMO resulted in an acceptable 0.907 measure of sampling adequacy. The result was higher than 0.5 and this indicated the appropriateness of the data for EFA. The Bartlett's Test of Sphericity was highly significant at $p < 0.001$, further supporting the suitability of the data for EFA.

Table 7.14: KMO and Bartlett's Test for strategies for the sustainable adoption of e-health tools

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.907
Bartlett's Test of Sphericity	Approx. Chi-Square	2893.303
	df	91
	Sig.	<.001

Following the completion of the KMO and Bartlett's Test for the strategies for the sustainable adoption of e-health tools, an EFA was performed, and three distinct factors were extracted. However, factor 2 consisted of only two items, falling below the recommended minimum of two items per factor as established by Hair et al. (2014:92). As a result, EFA was reanalysed, extracting 2 factors. While the second factor contained a sufficient number of items, however, when testing reliability, it was found that the second factor had a Cronbach's Alpha score of 0.571 which indicated that the factor was unreliable. EFA was reanalysed, extracting one factor. The single factor extracted accounted for 43.539% variance. Factor 1 extracted contained 10 items. The items that formed the factor were reviewed and labelled as strategies for the sustainable adoption of e-health tools. The factor structure can be seen below in Table 7.15, while Table 7.16 thereafter displays the total variance explained by the extracted factors for the strategies for the sustainable adoption of e-health tools.

Table 7.15: Factor structure for strategies for the sustainable adoption of e-health tools.

Factor Matrixa	
	Factor
	1
Increasing partnerships with private and public organisations will help my university use e-health tools for DMHS.	
Offering financial incentives to university staff will effectively help to promote and significantly increase the adoption of e-health tools.	
It is important for our university to partner with internet providers to expand networks in some areas with limited internet access.	
It is important for our university to consult with university staff to promote DMHS.	0.753
Training university staff on how to use e-health tools for DMHS will help to increase the adoption of these tools at our institution.	0.847
Educational initiatives and awareness campaigns about e-health tools for DMHS at our institution will increase adoption of these tools.	0.859
Our university need to communicate regularly on the DMHS available.	0.867
Our university needs to provide DMHS in different languages from the 12 official SA languages.	0.544
DMHS should be supported with some traditional face-to-face services.	0.483
Collecting user feedback regularly is essential to assess the effectiveness of DMHS.	
Top management support is necessary for the sustainable use of e-health tools for DMHS at our university.	0.676
Our university need more resources such as alternative sources of electricity, ICT infrastructure, financial and human resources to deliver DMHS effectively.	0.843
Data management and security systems are necessary to protect the privacy and confidentiality of user data used in e-health tools for DMHS at our university.	0.861
Data privacy and security policies are necessary at our university regarding the use e-health tools for DMHS.	0.844

Extraction Method: Principal Axis Factoring.

a 1 factors extracted. 4 iterations required.

Table 7.16: Total variance explained by extracted factors for the strategies for the sustainable adoption of e-health tools.

Total Variance Explained						
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.467	46.194	46.194	6.095	43.539	43.539
2	1.619	11.563	57.757			
3	1.121	8.011	65.768			
4	0.939	6.706	72.474			
5	0.715	5.105	77.578			
6	0.629	4.492	82.071			
7	0.53	3.788	85.859			
8	0.493	3.521	89.38			
9	0.374	2.673	92.053			
10	0.334	2.385	94.438			
11	0.241	1.719	96.157			
12	0.219	1.563	97.72			
13	0.19	1.358	99.078			
14	0.129	0.922	100			

Extraction Method: Principal Axis Factoring.

7.5 Reliability and validity analyses

As explained in the previous chapter, reliability and validity tests were undertaken as a necessary process to support the development of a robust measurement model in this study. Therefore, this section presents study findings relating to the reliability and validity analyses of the six factors identified.

7.5.1 Reliability and convergent validity analyses

Table 7.17 shows the findings of the reliability and convergent validity tests for the six factors (constructs) identified, followed by their interpretation.

Table 7.17: Reliability and convergent validity of the constructs

Constructs	Items	Cronbach's Alpha	AVE	CR
Current state of adoption	3	0.682	0.445	0.700
Experience gained during COVID-19	7	0.742	0.290	0.732
University capacity to deliver DMHS	5	0.875	0.534	0.850
Perceived benefits and importance of e-health tools	5	0.853	0.560	0.864
External support necessary for university capacity	5	0.834	0.490	0.823
Strategies for the sustainable adoption of e-health tools	10	0.932	0.585	0.914

7.5.1.1 Current state of adoption

The Cronbach's Alpha confirmed an acceptable internal consistency of 0.682 for the current state of adoption factor. The AVE value was 0.445 and this value indicated that the items in this factor explained 44.5% of the variance. This result was also acceptable. Furthermore, the CR was 0.700, demonstrating that the items in this factor were reliable and acceptable to this study.

7.5.1.2 Experiences gained during COVID-19

The Cronbach's Alpha for the experiences gained during the COVID-19 factor was 0.742 and this indicated good reliability of the factor. AVE resulted in a 0.290 and this reflected the lack of convergence of observed variables on the underlying factor. However, the CR was 0.732, indicating that the items in this factor were relatively reliable and were thus incorporated into the measurement model.

7.5.1.3 University capacity to deliver DMHS

The internal consistency for the university capacity to deliver DMHS was found to have an excellent level of reliability as indicated by a Cronbach's Alpha of 0.875. The AVE was 0.534 and this was considered acceptable. The CR was 0.850 which was also considered good and acceptable.

7.5.1.4 Perceived benefits and importance of e-health tools

The internal consistency of the perceived benefits and importance of e-health tools factor was found to have an excellent level of reliability as indicated by a Cronbach's Alpha of 0.853. The

AVE was 0.290 and this highlighted that this factor accounted for only 29% of the variance in the construct. The CR was high at 0.864 and this demonstrated that the items in this factor were reliable and acceptable to this study.

7.5.1.5 External support necessary for university capacity

With regards to external support necessary for university capacity factor, Cronbach's Alpha of 0.834 indicated a good level of internal consistency. Based on the AVE of 0.490, it can be concluded that the items in this factor only explained 49% of the variance in the construct. A CR of 0.823 indicated a high degree of reliability for the items in this factor and this was acceptable to this study.

7.5.1.6 Strategies for the sustainable adoption of e-health tools

The Cronbach's Alpha for this factor was 0.932 and this suggested that the items in this factor were strongly correlated and this result was acceptable to this study. The AVE value was 0.585, showing that the items in this factor explained 58.5% of the variance in the construct. The CR was 0.914 and this means that the items in this factor were highly reliable and acceptable to this study.

7.5.2 Discriminant validity analysis of the constructs

Table 7.18 depicts the correlation matrix for the latent constructs with AVE. Using the Fornell-Larcker criterion, it is evident that discriminant validity was achieved in this study, as the results of the study demonstrated that each construct has a higher square root of AVE than any other construct, highlighting that the constructs of the study are measuring distinct aspects.

Table 7.18: Correlation matrix for the latent constructs with AVE

Construct	PBEIT	UCDMHS	ESIUC	IF(Overall)	EGDCP	SSAEHT	CSA
PBEIT	1						
UCDMHS	0.452**	1					
ESIUC	0.625**	0.627**	1				
IF(Overall)	0.789**	0.858**	0.879**	1			
EGDCP	0.627**	0.379**	0.498**	0.579**	1		
SSAEHT	0.379**	0.725**	0.523**	0.665**	0.265**	1	-

Note: PBEIT = Perceived benefits and importance of e-health tools; UCDMHS = University capacity to deliver DMHS; ESIUC = External support to improve university capacity; IF(Overall) = Influencing factors (Overall); EGDCP = Experiences gained during the COVID-19 pandemic; SSAEHT= Strategies for the sustainable adoption of e-health tools; CSA= Current state of adoption.

7.6 Findings of the CFA

Having established factor reliability and validity, this section reports CFA findings. As explained in the previous chapter, a CFA was performed to validate the factor structure determined through EFA as part of the broader SEM. This means, prior to hypothesis testing, a CFA was performed to assess the fitness of the proposed conceptual framework model to the observed data. The measurement model diagram in Figure 7.8 below shows the hypothesised relationships between the observed variables (indicators) and the latent variables (constructs).

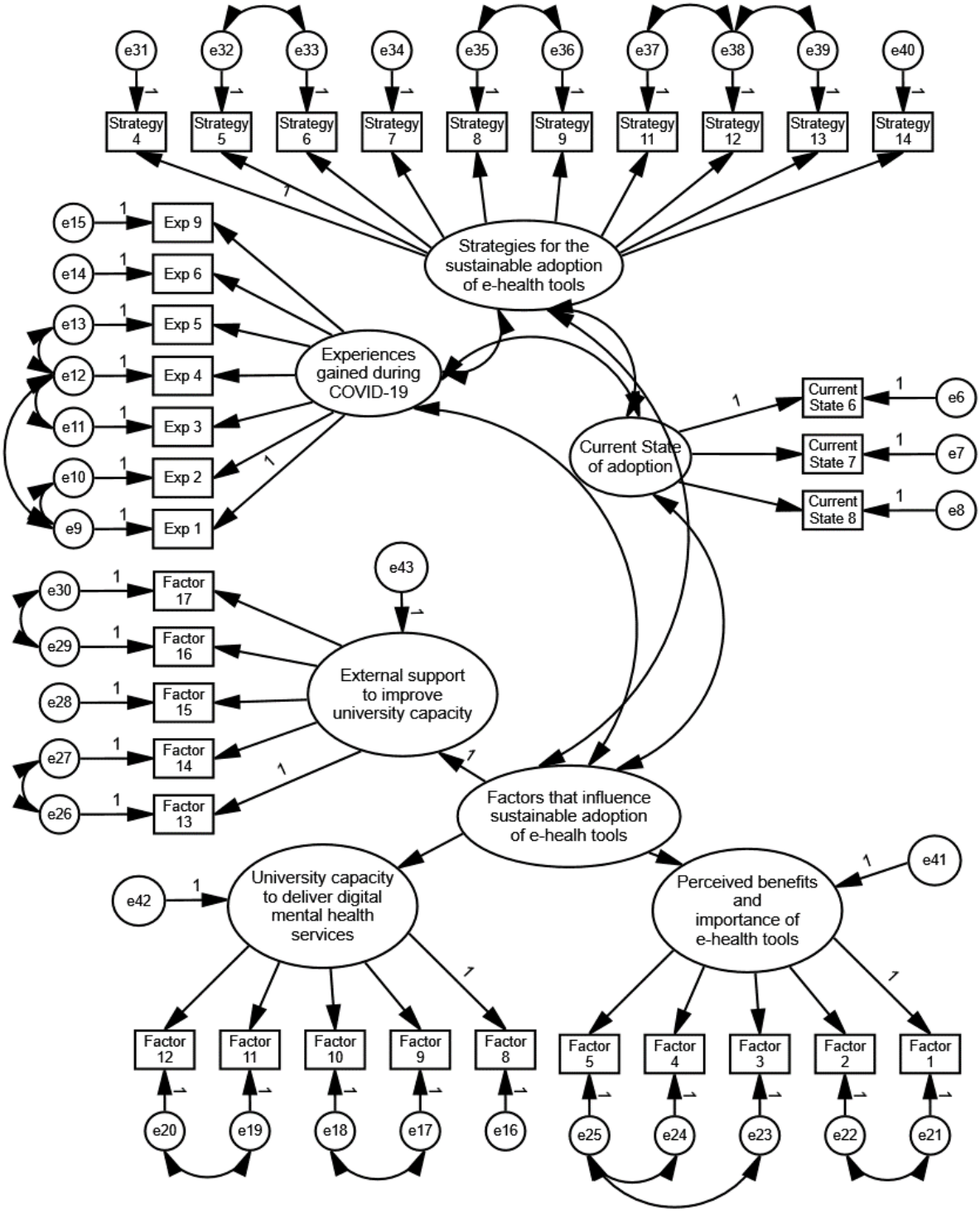


Figure 7.8: Measurement model

Source: AMOS output

7.6.1 Conceptual model fit assessments

Table 7.19 below presents CFA model fit results. An interpretation and decisions based on recommended thresholds follow in the next section.

Table 7.19: CFA model fit results

Fit index	Recommended thresholds	CFA study results	Decision
CMIN/df	< 3.00	2.334	Accepted
RMSEA	< 0.08	0.062	Accepted
CFI	> 0.90	0.896	Accepted
SRMR	< 0.08	0.078	Accepted

Table 7.19 above confirms that all CFA model fit indices meet the acceptability criteria. Accordingly, the proposed conceptual framework model is well aligned with the observed data and was thus used to represent the underlying relationships between the variables of the study. Each fit index is further explained below.

- **CMIN/df:** The CMIN/df value of 2.334 was statistically insignificant and below the acceptable threshold of < 3.00. Thus, a decision to accept was made as the result falls within the recommended range, indicating a good model fit.

- **CFI:** The CFI value of 0.896 was slightly below the commonly used threshold of 0.90 and this indicated a good model fit and led to its acceptance.

- **RMSEA:** The RMSEA value was very low (0.062) and this demonstrated a good fit of the model. This suggests that the model effectively captured the underlying relationships between the variables in the data.

- **SRMR:** The SRMR value of 0.0788 was below the threshold of 0.08 and this means it is a good fit for the model. Thus, a decision to accept was made.

7.7 Findings of the SEM

Upon obtaining a reliable and acceptable CFA fit for the measurement model, the study proceeded to the next step by performing a SEM model fit analysis. Table 7.20 below shows the findings of the SEM model fit analyses. Subsequently, a brief interpretation and decision for each index based on the specified fit indices and their acceptable threshold follows.

Table 7.20: SEM model fit results

Fit index	Recommended thresholds	SEM model study results	Decision
CMIN/df	< 3.00	2.632	Accepted
RMSEA	< 0.08	0.069	Accepted
CFI	> 0.90	0.873	Accepted
SRMR	< 0.08	0.060	Accepted

As illustrated in Table 7.20, the overall fit of the SEM model is acceptable. Each fit index is briefly explained below:

- The CMIN/df value is below the recommended threshold of 3.00 at 2.632.
- The RMSEA is within the acceptable range at 0.069.
- The CFI is below the acceptable threshold of 0.90 at 0.0873
- The SRMR is reasonably low at 0.060.

Considering these findings, it can be established that the SEM model provides a good fit for the observed data and can thus be used to draw inferences regarding the causal relationship between the variables of the study. Figure 7.9 below depicts the overall SEM model diagram and it is based on the SEM model results as presented and discussed above.

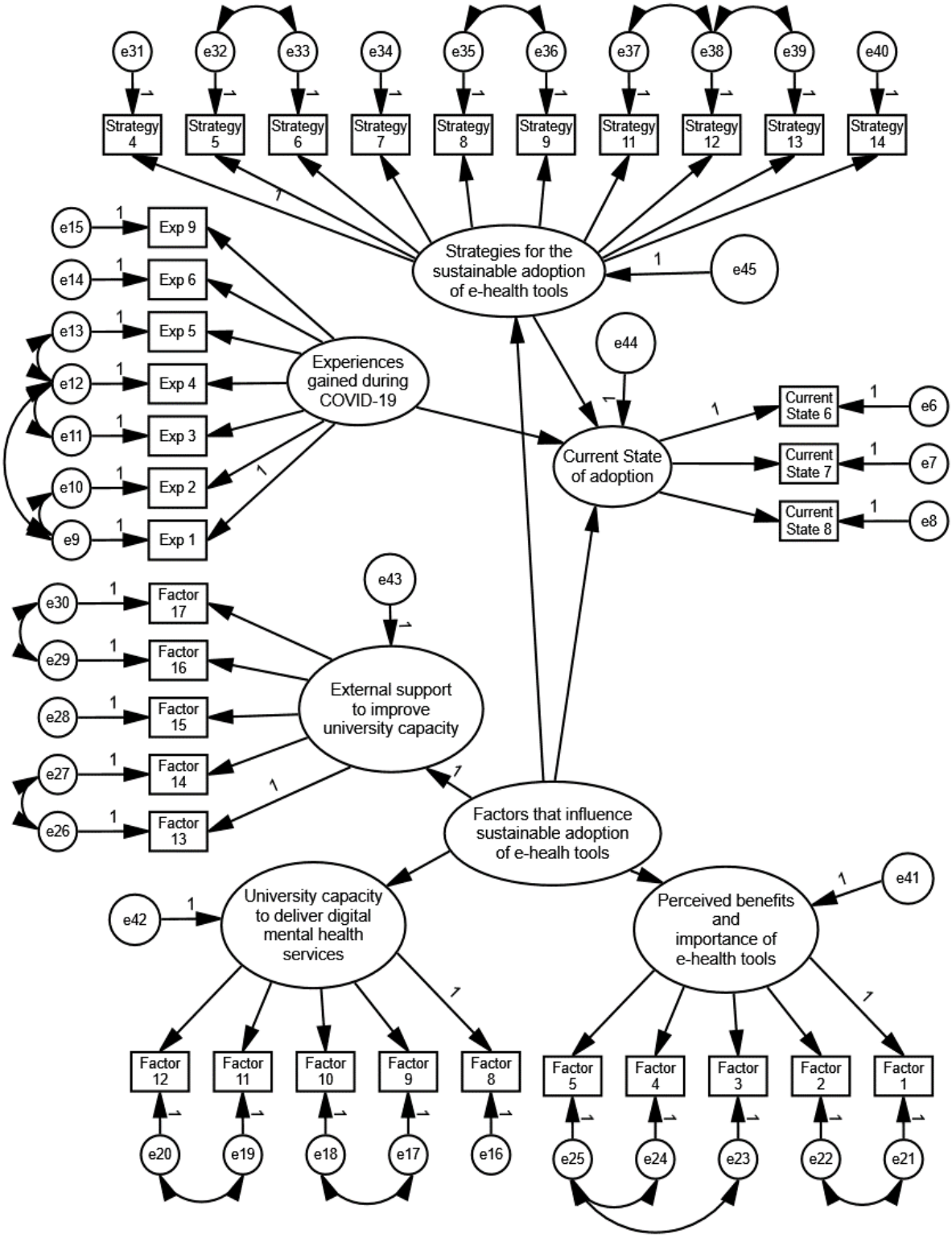


Figure 7.9: Overall SEM model diagram

Source: AMOS output

7.8 Hypotheses testing

Table 7.21 below presents a summary extract from AMOS output for the standardised regression coefficients generated after conducting the SEM for this study. The standardised regression coefficients indicate the hypothesised relationships between the latent variables that comprise the underpinning causal structure of the sustainable adoption of e-health tools in delivering DMHS at the selected university. The following is a brief explanation of the abbreviations and the standardised regression coefficients presented in Table 7.21 below.

- **Estimate**: Denoted by the symbol β (Beta), the estimates reflect the strength and direction of the relationship by representing model parameter values for the path coefficient.
- **Standard Error (S.E)**: The S.E represents the standard error of the estimate, which indicates the accuracy of the parameter estimate.
- **Critical Ration (C.R)**: The C.R refers to the ratio of the estimate to its standard error and it is used to assess the statistical significance of the estimated parameter.
- **Probability (*P*)**: In SEM, the "*P*" (*p*-value) reflects the probability associated with the hypothesis test for each parameter. As Hoyle (1995) suggests, the *p*-value assumes the test is null (zero). This study assumed non-zero coefficients and used $p < 0.05$ to determine statistical significance relationships, indicating they are unlikely due to chance.

Table 7.21: Standardised regression coefficients

Structural path			β	S.E.	C.R.	*P*
Strategies for the sustainable adoption of e-health tools	<---	Factors that influence the sustainable adoption of e-health tools	1.216	0.131	9.269	***
External support to improve university capacity	<---	Factors that influence the sustainable adoption of e-health tools	1			
University capacity to deliver DMHS	<---	Factors that influence the sustainable adoption of e-health tools	1.504	0.156	9.643	***
Perceived benefits and importance of e-health tools	<---	Factors that influence the sustainable adoption of e-health tools	0.505	0.073	6.941	***
Current state of the adoption	<---	Experiences gained during COVID-19	0.064	0.09	0.714	0.475
Current state of the adoption	<---	Strategies for the sustainable adoption of e-health tools	0.189	0.098	1.918	0.055
Current state of the adoption	<---	Factors that influence the sustainable adoption of e-health tools	-0.332	0.16	-2.078	0.038

This section summarises hypotheses tested, with more details in the next chapter.

The study findings revealed a statistically significant positive relationship between the factors influencing the sustainable adoption of e-health tools and the strategies for their sustainable adoption (β = 1.216, SE = 0.131, CR = 9.269, $p < 0.001$), supporting H_1.

The findings of the study did not demonstrate a statistically significant relationship between experiences gained during COVID-19 and the current state of e-health tools adoption (β = 0.064, SE = 0.09, CR = 0.714, $p = 0.475$). This indicated the absence of a positive relationship between these two variables and led to the rejection of H_2.

The research findings showed a statistically significant negative relationship between factors influencing sustainable adoption of e-health tools and the current state of adoption (β = -0.332, SE = 0.16, CR = -2078, $p = 0.038$). The findings suggested that as the factors influencing sustainable adoption increase, the current state of adoption tends to decrease, leading to the support of H_3.

The research findings revealed a statistically significant positive relationship between the current state of adoption of e-health tools and strategies for their sustainable adoption (β = 0.189, SE = 0.098, CR = 1.918, $p = 0.055$). However, the findings also indicate that the path coefficient is relatively small, suggesting that the relationship is marginally significant (supported at a 10% level), leading to the support of H_4.

7.9 Summary

The study employed tables and other forms of data presentation to display the research findings. To summarise and describe the demographic information of the study sample, the study used frequency distribution. Subsequently, the study continued with a presentation of descriptive statistics resulting from the data collected. The presentation focused on the summary of key measures of central tendencies and variability of the observed values in the study. Following the presentation of descriptive statistics, the chapter then moved on to present study findings that emerged from EFA. The EFA resulted in the identification of six key factors related to the sustainable adoption of e-health tools. The factors identified included (1) the current state of adoption, (2) experiences gained during the COVID-19 pandemic, (3) university capacity to deliver DMHS, (4) perceived benefits and importance of e-health tools, (5) external support to improve university capacity and (6) strategies for the sustainable adoption of e-health tools. The reliability and validity of the identified factors showed satisfactory results.

Building upon the six identified key factors, the study moved on to perform CFA and reported the findings. Based on various fit indices namely CMIN/df or χ^2/df, RMSEA, CFI and SRMR, it was confirmed that all the CFA model fit results are acceptable. Accordingly, the proposed conceptual framework model was found to be well-aligned with the observed data and was used to represent the underlying relationships between the variables.

For advanced data analysis, SEM was utilised as an advanced statistical method to assess complex relationships among variables of the study. In essence, SEM was applied appropriately and the findings were reported. Finally, this chapter encompassed hypothesis testing to determine whether the investigated relationships were statistically significant and the findings were reported accordingly. Specifically, three hypotheses were supported and one hypothesis was not supported. The next chapter discusses the research findings in great detail.

CHAPTER 8

DISCUSSIONS OF RESEARCH FINDINGS

8.1 Introduction

The purpose of this chapter is to provide quantitative discussions to interpret the findings of this empirical study and this complements the research findings presented in the previous chapter. The discussions of research findings in this chapter encompass interpreting the meaning of the research findings in relation to the literature review chapters. The discussions commence with demographic information and this helps to understand the study sample. A concise discussion of descriptive statistics follows which summarises the variables investigated. Next, an in-depth discussion of the factors identified through EFA follows. Finally, findings from the SEM are discussed and interpreted to understand complex relationships among the study variables as well as testing all the hypotheses of the study.

8.2 Discussion of demographic information

The study employed frequency distribution and the analysis of demographic information revealed the following insights:

Out of a total of 348 respondents, 55.2% (N=192) were females and 44.8% (N=156) were males. A slight female majority indicated a gender imbalance in the study. Research studies consistently show that men are less motivated than women when it comes to seeking help for mental health issues, with women demonstrating higher help-seeking behaviours for common mental health disorders (Liddon, Kingerlee & Barry, 2018:42; Oliver, Pearson, Coe & Gunnell, 2005:300). Interestingly, a study conducted by Guendelman, Broderick, Mlo, Gemmill and Lindeman (2017:7) found that women are more open to the adoption of e-health tools considering their higher engagement with DMHS and active search for health-related information on the internet. Therefore, a slight female majority suggests that females at University X could be more receptive to the usage of e-health tools for DMHS than males. In this regard, University X may potentially experience higher adoption rates among female staff due to their openness and proactive engagement with DMHS. Consequently, University X may need to consider implementing sustainable adoption strategies targeting males to encourage and support them in adopting e-health tools thereby ensuring balanced and inclusive access to these tools for DMHS at the institution.

In terms of race, there was a significant representation of respondents of African descent (46.3%), Coloured descent (25.6%), Indian descent (14.7%) and White descent (12.6%) in the

research findings. Research studies show race and culture influence the usage of e-health tools, with non-White individuals facing more barriers (Jacob, Sezgin, Sanchez-Vazquez & Ivory, 2022:11). However, other studies report that being non-White facilitates the adoption of e-health tools (Kontos, Blake, Chou, & Prestin, 2014:12). These findings have been attributed to other contextual factors including non-White patients being less concerned about ethical issues such as privacy and confidentiality in comparison to their White peers (Abelson, Kaufman, Symer, Peters, Charlson & Yeo, 2017:610). Thus, the research findings of this study suggested the need for University X to consider the influence of race and cultural factors on preferences and perceptions regarding the sustainable adoption of e-health tools for DMHS. The findings also suggested the need for culturally sensitive approaches and strategies to address the diverse needs of the university community.

In terms of the respondents' age groups, the research found that most of the respondents (42.8%) were in the age group of 40 – 49 years old, followed by those between 50 – 59 years old (26.7%), followed by those in the age group between 30 – 39 years old (23.9%), followed by 60 years and older respondents (3.7%) and lastly 2.9% were in the age group of 20 – 29 years old. Accordingly, it is evident that the majority of respondents in the study were Generation X (40 – 55 years of age), who accounted for 42.8% of the sample, whom the study is most likely to have an impact on in the long-term use of e-health tools for DMHS at University X. However, the overall demographic distribution suggests that University X must cautiously cater to the varying technological proficiency and preferences of different age groups in the future to ensure continual delivery of DMHS post-COVID-19. For Generation X, the focus could be on user-friendly interfaces and robust support systems to ease the transition to e-health tools considering that this generation values personal interaction (Alanzi, Alsalem, Alzahrani, Almudaymigh, Alessa, Mulla, AlQahtani, Bajonaid, Alharthi, Alnahdi & Alanzi, 2023:8). Furthermore, for Generation Y which constituted 23.9% of the sample (30 – 39 years old) and Generation Z which constituted 2.9% of the sample (20 – 29 years old) who are generally more tech-savvy, the delivery of DMHS could leverage advanced features and integration with existing digital systems to maximize user engagement and effectiveness (Alanzi et al. 2023:1). For university staff aged between 50 – 59-years-old who are part of the Baby Boomer generation and constitute 26.7% of the research sample, the delivery of DMHS through e-health tools would benefit from simple and user-friendly e-health tools with a clear demonstration of their advantages as this age group is generally slower to adopt new technology (LeRouge, Van Slyke, Seale & Wright, 2014:17).

The majority (51.7%) of respondents indicated that a master's degree was their highest level of qualification, followed by 18.1% who indicated a doctoral degree attained. The research

findings indicate that a highly educated sample took part in this study. Education is a key demographic factor and lower levels of education are typically regarded as a barrier to the adoption of e-health tools (Beard, Silverman, Forgeard, Wilmer, Torous & Björgvinsson, 2019:6). In addition, studies have reported a positive relationship between health levels and the willingness to use e-health tools among users (Qan'ir, Khalifeh, Eid, Hammad & Al-Batran, 2021:8). Moreover, other studies have found a correlation between educational levels and increased digital literacy which generally makes it easier for individuals to comprehend and navigate e-health tools (Karnoe & Kayser, 2015:597). Therefore, the fact that a highly educated sample took part in this study suggests that educated individuals may have greater levels of adopting and utilising e-health tools for DMHS. Their potential openness and familiarity with e-health tools for DMHS may significantly facilitate long-term usage of these tools at University X.

The study found that the majority of respondents (58.9%) were predominantly academic staff, followed by 35.6% non-academic staff (support staff) and 5.3% who were management staff. It is not surprising that academic staff constituted the majority of respondents in this study considering they comprise the largest group of employees at the university (University X, 2021:17). They contribute significantly beyond teaching and learning through a diverse range of roles and responsibilities. However, the stress and workload associated with academic roles may impact their mental health needs and increase the need for e-health tools for DMHS. Therefore, the continual provision of DMHS through e-health tools post-COVID-19 would be particularly important for academic staff due to the high stress and workload they often experience in their work environment (Kinman & Johnson, 2019:159; Gie et al. 2017:11; Barkhuizen, Rothmann & Van de Vijver, 2014:330; Bezuidenhout & Cilliers, 2010:1). DMHS could provide accessible support that can help manage mental health challenges, thus improving overall well-being and productivity (WHO, 2013:21).

The study found that the majority (69.5%) of respondents to this research study were permanently employed, while 30.5% were fixed-term employees. These findings were contrary to the findings of CHE (2018:41) who reported that 65% of academic employees in SA public HEIs are temporary employees. The research findings of this study highlight that the research study focused on established professionals with stable positions and may have missed crucial key insights from those with less stable employment. The distinction in employment status of the respondents is significant because if University X continues with DMHS through e-health tools post-COVID-19, permanent staff would have more consistent access to DMHS, due to their long-term engagement with the university. In contrast, fixed-term staff could face barriers to accessing these services due to the temporary nature of their

contracts. Consequently, it seems tailored sustainable adoption strategies for e-health tools would be necessary to ensure equitable access to DMHS for all university staff.

The research found that 29.6% of respondents had been with their current institution for 6 – 10 years, followed by 21.8% and 21.3% for 0 – 5 years. The remaining 19.3% were split between 16 – 20 years (8.0%) and over 21 years (19.3%). Accordingly, the findings demonstrate a combination of new and experienced university staff members which provides diverse perspectives on the usage of e-health tools for DMHS in the future. In this regard, the sustainable adoption of e-health tools for DMHS may vary by length of service at University X. Experienced university staff members may be more resistant to the use of e-health tools given their established routines and preferences for traditional methods, compared to new staff who may perceive them as innovative solutions to mental health issues within the HE sector (Schroeder, Dodds, Georgiou, Gewald & Siette, 2023:15; Yakovchenko, McInnes, Petrakis, Gillespie, Lipschitz, McCullough, Richardson, Vetter & Hogan, 2021:7).

8.3 Discussion of descriptive statistics

The utilisation of descriptive statistics to explain the central tendency and variability of the constructs of the study revealed the following insights:

8.3.1 Current state of the adoption of e-health tools

For the current state of the adoption of e-health tools, the analysis of descriptive statistics revealed that while respondents indicated stable internet access at home (mean = 1.92 and SD of 1.296), internet cost concerns (mean = 2.20 and SD = 1.475) remained a significant barrier, potentially limiting sustainable adoption of e-health tools for DMHS. The research findings support prior research which established that internet access is increasingly viewed as a fundamental need (Aungst & Patel, 2020:1). Therefore, the relatively positive response in this study suggests that the university staff have better access to the internet when compared to the broader SA population. Although descriptive statistics displayed moderate concerns regarding internet cost, the findings exemplified broader issues in SA where internet costs are high, limiting access to digital services including those for mental health (Gillwald et al. 2018:97). The internet costs issues are important to take note as they can hinder the usage of e-health tools which heavily rely on internet accessibility (Mwangama et al. 2020:7). Thus, addressing internet cost concerns would be essential for the long-term use of e-health tools for DMHS at University X.

Descriptive statistics indicated significant use of multiple devices to access the internet (mean = 1.52 and SD = 0.976) and social media platforms (mean = 1.74 and SD = 1.237).

Accordingly, the strong agreement on the use of multiple devices is consistent with global developments which show that smartphones, tablets, and computers are integral to daily life (Aungst & Patel, 2020:1). Hence, the findings of this study are encouraging as they demonstrate readiness among the respondents to engage with DMHS and the potential for University X to leverage and harness these tools for improving university staff mental health. The respondents' regular usage of social media corresponds with previous findings that social media platforms are useful and appealing for communication and information sharing (Wankel et al. 2010:242; Sawyer & Chen, 2012:165). Moreover, social media platforms can play a vital role in delivering DMHS (Korda & Itani, 2013:21; Kruzan et al. 2022:10).

Further analysis of the descriptive statistics illustrated that awareness of DMHS particularly those provided for free by external organisations such as Higher Health, SADAG, and Momentum Wellness was relatively low (mean = 3.29 and SD = 1.664). In addition, descriptive statistics showed the respondents' perceptions that University X does not provide these services for free (mean = 3.46 and SD = 1.484). The descriptive statistics suggest that there is a need to improve educational initiatives and awareness campaigns as recommended by previous studies (Mbunge et al. 2022:10; Stoll et al. 2020:9). Effective educational initiatives and awareness campaigns will help to increase visibility and accessibility of e-health tools for DMHS. Even though 4IR technologies are revolutionising DMHS, the awareness of these technologies also remained low in this study (mean = 3.49 and SD = 1.590). The findings suggest this could be a barrier to the use of e-health tools for DMHS (Mwangama et al. 2020). Therefore, there is a need to inform and educate the users about them including the benefits.

In spite of low awareness and availability of DMHS, the descriptive statistics showed that respondents had a clear preference for DMHS delivered via e-health tools over traditional in-person services (mean = 1.92 and SD = 1.296). The respondents' strong preference for DMHS illustrates a significant shift towards e-health tools and readiness to embrace modern technologies which reflects global trends accelerated by the recent COVID-19 (Fagherazzi et al. 2020:6). Considering the mean = 2.58 and SD = 1.483, the descriptive statistics indicated that on average, the respondents agreed that they regularly search for DMHS on the internet. Accordingly, the descriptive statistics imply that respondents were generally open or were actively seeking DMHS online. However, a closer look at the descriptive statistics shows a moderate level of engagement in the search for DMHS given that responses moved from neutral to slightly negative. Accordingly, these findings may be due to a lack of trust or awareness of DMHS which can be linked to previous studies that suggested DMHS require more credibility and visibility (Hanisch et al. 2016:9).

8.3.2 Experiences gained during the COVID-19 pandemic

The descriptive statistics for the experiences gained during the COVID-19 pandemic suggested that respondents who participated in the study generally had a positive experience concerning the use of e-health tools for DMHS at University X. Key insights revealed that e-health tools (mean = 1.69 and SD = 1.010) and social media platforms (mean = 1.77 and SD = 1.103) were perceived as useful for DMHS during COVID-19 as indicated by the strong agreement on their benefits and effectiveness. The findings are consistent with the findings of Murphy et al. (2021:169) who highlighted the accelerated adoption and acceptance of e-health tools for DMHS during the COVID-19. Other researchers such as Fagherazzi et al. (2020:6) and Rudd and Beidas (2020:2) support this trend and further emphasise that DMHS will remain essential in the post-pandemic era. The fact that respondents strongly agreed that social media had a substantial impact on their mental health during the pandemic reinforces the perception that it is a beneficial tool for communication and information sharing. It is therefore no surprise that the descriptive statistics for this study relating to the significance of social media are consistent with the literature, with researchers such as Cunningham et al. (2021:251) and Padín et al. (2021:14) noting its role in connecting individuals experiencing mental health issues. Korda and Itani (2013:21) affirm social media's broad reach and pervasiveness make it effective for spreading awareness and disseminating information, particularly during crises such as COVID-19 (Saud et al. 2020:8).

The mean value of 2.02 and SD of 1.260 indicated that respondents were generally satisfied with their experiences in using e-health tools, suggesting they were effective in delivering DMHS during COVID-19. The descriptive statistics suggested positive user experiences which correspond with trends in developed countries where e-health tools were largely successful and users were satisfied with them during the COVID-19 pandemic due to their convenience and cost-effectiveness (Tebeje & Klein, 2021:153).

Furthermore, the moderate perception of university commitment (mean = 2.26 and SD = 1.365) and the variety of DMHS (mean = 2.66 and SD of 1.504) demonstrated potential areas for improvement and development for the future delivery of DMHS at University X. Accordingly, the digital mental health initiatives and efforts by University X and other external organisations exhibit a proactive approach to providing comprehensive mental health support during the COVID-19 pandemic. It further demonstrates and reflects the institutional commitment to university staff wellbeing, suggesting that offering a diverse range of DMHS could be key towards addressing and managing various mental health needs.

Further analysis of the descriptive statistics indicated that respondents slightly disagreed that installing digital mental health applications played a significant role in supporting their mental health during COVID-19 (mean = 3.21 and SD = 1.432). As a result, the findings illustrated that some respondents were sceptical and potentially unaware of the role or how to install digital mental health applications during the pandemic. Researchers such as Sinha et al. (2023:7) provide evidence of the effectiveness of artificial intelligence-driven applications such as Wysa in reducing anxiety and depression during the pandemic. Notwithstanding their potential, the respondents' slight negative perception in this study suggests that there is a need to increase awareness and trust in artificial intelligence-driven applications such as Wysa.

With a mean value of 3.23 and a SD of 1.524, the respondents did not agree that their decision not to use e-health tools was influenced by the absence of a legal framework in SA during the recent pandemic. As a result, the descriptive statistics indicated that respondents were concerned about the regulatory framework surrounding digital health services in SA. Therefore, the lack of specific artificial intelligence-driven legislation in SA as explained in the literature review highlights the importance of developing a comprehensive and specific legal framework to guide and regulate the ethical use of e-health tools for DMHS (Naidoo et al. (2022:15). The mean value of 2.03 and the SD 1.238 indicated that respondents were concerned about ethical guidelines for DMHS during the pandemic. According to Ngcobo-Sithole and Mabusela (2022:257), there is a need for standard protocols to ensure the effective delivery of DMHS especially in crisis situations like COVID-19. Moreover, ethical concerns relating to privacy, confidentiality and data protection are significant as highlighted by Tagde et al. (2021: 52811) and Bassan (2020:10).

Considering the mean value of 1.74 with a SD of 1.089, descriptive statistics revealed a significant agreement among the respondents that e-health tools are an effective way of delivering DMHS at University X post-COVID-19. The descriptive statistics indicate a strong and clear preference for continuing with DMHS beyond COVID-19 and this draws attention to the importance of maintaining and strengthening these services. The findings are congruent with the study by Reingold et al. (2021:6) who reported a significant shift towards e-health tools during the recent pandemic. Thus, DMHS have been invaluable and should be further supported after the pandemic.

8.3.3 Factors that influence the sustainable adoption of e-health tools

The mean value of 1.67 with a SD of 0.982 for perceived usefulness indicated that respondents perceived e-health tools as useful. The findings are consistent with Davis (1989:320) who

asserts that perceived usefulness directly influences technology acceptance. Therefore, in this study, the positive perceptions suggest that respondents strongly believed e-health tools can enhance the delivery of DMHS.

While the descriptive statistics showed that there is room for improvement in the interface and user experience, the perceived ease of use was generally agreed upon, indicating that e-health tools were relatively easy to use as evidenced by a mean value of 1.99 with a SD of 1.314. A recent study confirmed the ease of use impacts the adoption and usage of e-health tools (Bamufleh et al. 2021:17). Therefore, streamlining interfaces and adopting user-friendly designs would help to increase the long-term utilisation of e-health tools for DMHS at University X.

With a mean value of 1.81 and a SD of 1.117, the respondents displayed a positive perception towards the use of e-health tools for DMHS. The findings reflected favourable attitudes which researchers such as Davis (1989:321) link to higher behavioural intention to use technology. Thus, in this study, positive attitudes would be crucial for driving the sustainable adoption of e-health tools for DMHS at University X.

As evidenced by a mean value of 1.83 with a SD of 1.112, the respondents agreed on the future usage of e-health tools. The positive perception suggested a forward-looking perspective and readiness for future use of e-health tools for DMHS. Research shows the behavioural intention to use reflects the likelihood of embracing technology and in this study e-health tools for DMHS (Davis, 1989:321). The research findings of this study align with recent studies that report that if users believe in the future benefits of technology, they are more likely to adopt it (Gbollie et al. 2023:18).

The respondents agreed that e-health tools are compatible with their university's existing ICT infrastructure (mean = 1.92 and SD = 1.172). The findings suggest the respondents were confident in the current ICT setup of their institution in that it can support the provision of DMHS. This is consistent with Jere and Ngidi (2020:3) who argue that compatibility with existing technologies and processes facilitates easier adoption. Therefore, compatibility with existing ICT infrastructure will be essential for the sustainable adoption of e-health tools for the delivery of DMHS at University X.

The mean of 2.61 with a SD of 1.449 reflected a slightly negative perception of the complexity of adopting e-health tools, indicating perceived challenges at University X. The study findings correspond with the assertions by Jere and Ngidi (2020:3) that perceived complexity can hinder technology adoption. Han et al. (2020:7) also note that complex technologies are less

likely to be adopted. Therefore, there is a need for adjustments to ensure more user-friendly interfaces and processes to mitigate negative concerns and encourage broader acceptance among university staff leading to future utilisation of e-health tools for DMHS.

The descriptive statistics showed that respondents were slightly positive regarding top management's interest in supporting e-health initiatives for DMHS given the mean value of 2.18 with a SD of 1.421. The descriptive statistics indicate that while there is a moderate positive perception regarding top management support, it might not be sufficient for ensuring the sustainable adoption of e-health tools. Research shows that top management is crucial for securing resources and advocating for change (Johnson & Diman, 2017:13; Han et al. 2020: 8). Thus, without strong top management support, the adoption of e-health tools may face significant obstacles, suggesting a need for stronger commitment and advocacy from the university leadership.

The respondents' neutral perceptions regarding University X's financial capacity to support the delivery of DMHS indicated uncertainty or perceived limitations in institutional funding given the mean value of 2.24 with a SD of 1.452. However, the respondents were slightly positive about University X's ability to source the financial resources required to deliver DMHS considering the mean value of 2.03 with a SD of 1.294. These findings reflected cautious optimism (Johnson & Diman, 2017:14). The perception of financial resources as neither a strong barrier nor a significant enabler indicates a mixed view of the cost implications of adopting e-health tools which is consistent with previous studies reporting that financial resources are a key factor in the adoption of new technologies (Hiran & Henten, 2020:445). The descriptive statistics showed that while there is some confidence about University X's ability to source financial resources, the perception is not overwhelmingly positive and this aligns with the views of Fagherazzi et al. (2020:6) who note that financial constraints are a common challenge in low-income economies.

The mean value of 2.29 with a SD of 1.475 for ICT knowledge indicated that respondents had a slightly negative perception of University X's ICT knowledge for delivering DMHS and accordingly this highlighted a potential gap in expertise. Johnson and Diman (2017:13) stress the importance of skilled ICT staff in the sustainable adoption of new technologies. Therefore, there is a need for University X to invest in training and other capacity-building initiatives to harness the full potential of e-health tools in delivering DMHS in the future.

The respondents also expressed a slightly negative perception regarding the availability of technical support for the delivery of DMHS in their university (mean = 2.38 and SD = 1.515). The findings of the study contrast the literature which indicated the significance of technical

support in technology adoption (Maphalala & Adigun, 2020:10; Han et al. (2020:8). Therefore, as indicated by descriptive statistics, improvements in technical support services could enhance user experience in the delivery of DMHS, thereby promoting the sustainable adoption of e-health tools.

With a mean value of 2.00 and a SD of 1.318, the respondents perceived the size of University X as an enabling factor for delivering DMHS through e-health tools. The findings confirmed that larger organisational sizes are more beneficial for the sustainable adoption of e-health tools (Awa & Ojiabo, 2016:918; Ramdani, Chevers & Williams, 2013:747). Therefore, University X as a large institution will be better positioned to adopt e-health tools for the delivery of DMHS by utilising its capabilities (Han et al. 2020: 7; Ramdani et al. 2020:12).

The mean value of 1.95 with a SD of 1.216 revealed that respondents had a positive perception regarding government support. Similarly, the mean value of 2.03 with a SD of 1.214 also displayed positive perceptions regarding government policies and regulations. The positive perceptions of strong government support and government policies and regulations are consistent with the literature demonstrating that government involvement through initiatives and policies is pivotal in promoting ICT adoption in HEIs (Baker, 2012;151; Han et al. 2020: 8; Liang et al. 2017:11).

Considering a mean of 1.82 with a SD of 1.087, the respondents agreed that e-health tools provide a broader and wider variety of services compared to traditional face-to-face methods. The positive perception indicates an appreciation for the diverse options available through digital platforms. It also shows that e-health tools can offer unique benefits and services that are not always available in traditional face-to-face methods. The research findings are consistent with the relative advantage factor where the ability to offer a diverse range of services is seen as a benefit (Han et al., 2020). Some of the benefits of using e-health tools in the delivery of mental health services include the ability to customise them to meet the specific needs of university employees, the ability to access sensitive information at any time, anonymously, and in a more comfortable private environment (Ryan, Shochet & Stallman, 2010:74-75; Taylor & Luce, 2003:18). In addition, internet-based e-health tools provide an alternative option for users who do not prefer to utilise traditional face-to-face services or who may have geographic restrictions (Taylor & Luce, 2003:19).

The respondents strongly agreed on the importance of delivering DMHS to remain competitive (mean = 1.77 and SD = 1.126). The descriptive statistics suggest that the provision of DMHS through e-health tools has a strategic value at University X. The research findings align with Sligo et al. (2017:93), who assert that competitive pressure drives innovation and technology

adoption. Due to the strategic value these tools possess, University X should adopt e-health tools when providing DMHS to remain competitive.

The mean value of 1.60 with a SD of 0.965 indicated strong agreement on the necessity of external support for delivering DMHS. Han et al. (2020) highlights the critical role of external assistance in technology adoption. Researchers such as Maphalala and Adigun (2020:10) concur, noting the need for robust external support to facilitate technology adoption considering that SA HEIs typically concentrate on their core functions often lack the technical expertise and knowledge to adopt and use new technology. In view of the research findings, partnerships with organisations such as Higher Health, SADAG and Momentum Wellness would help to provide the necessary expertise and resources to support the sustainable adoption of e-health tools for the delivery of DMHS.

8.3.4 Strategies for the sustainable adoption of e-health tools

The mean value of 1.56 with a SD of .878 showed that respondents strongly agreed that increasing partnerships with private and public organisations will help their university to use e-health tools for DMHS. The research findings are consistent with empirical evidence which stresses the significance of collaborations for economic sustainability. For instance, Mbunge et al. (2022:8) and Jones et al. (2011:4) highlight those partnerships with hospitals, clinics, and mental health service providers are important for procuring the necessary resources and integrating e-health tools into existing systems. Therefore, increasing partnerships as an economic sustainability strategy will help to ensure broader digital mental health service delivery and address economic challenges through leveraging shared resources at University X.

The mean value of 2.33 with a SD of 1.340 revealed that respondents slightly disagreed that offering financial incentives to university staff will promote and significantly increase the adoption of e-health tools. The research findings were contrary to the findings of Ricciardi et al. (2013:378) who affirm that financial incentives encourage the sustainable adoption of e-health tools as individuals will be motivated to use e-health tools for their mental health. Thus, it is evident that financial incentives may not be the most effective economic sustainability strategy for promoting and significantly increasing the sustainable adoption of e-health tools at University X.

A mean value of 1.83 with a SD of 1.126 showed that respondents agreed on the importance of their university in partnering with internet providers to expand networks in areas with limited internet access. The findings obtained in this study are in line with the literature, pointing out

that affordable and accessible internet is key to the adoption of e-health tools (Khoja et al. 2013:50; Leon et al. 2012:10). Mbunge et al. (2022:10) support this, emphasising that expanding Wi-Fi hotspots and partnering with network providers can help bridge the digital gap mainly in areas with limited internet access. In this regard, partnering with internet providers will help University X to achieve economic sustainability by increasing access and affordability of DMHS to its staff.

The mean value of 2.07 with a SD of 1.406 indicated a moderate agreement on the significance of consulting university staff to promote DMHS. This finding has ample support from previous empirical research studies, according to which, end-users should be engaged from the start, to overcome possible resistance, increase acceptance, and meet stakeholder expectations (Fanta & Pretorius, 2018:140; Van Dyk et al. 2012:4). Consequently, engaging and consulting with users will help to ensure that e-health tools meet the needs of university staff, thereby enhancing social sustainability strategies at University X.

Training of university staff (mean = 2.19 and SD = 1.541) and educational initiatives and awareness campaigns (mean = 2.19 and SD = 1.449) were perceived as moderately important by the respondents. Several scholars suggest that training helps users understand and effectively use e-health tools for DMHS (Baniasadi et al. 2018: 667; Tilahun & Fritz, 2015:15; Mbunge et al. 2022:10). Educational initiatives and awareness campaigns, as explained by Stoll et al. (2020:9), are indispensable for the usage of e-health tools as they address the lack of understanding and familiarity among potential users.

Considering a mean value of 2.21 with a SD of 1.510, the respondents slightly agreed that their university needs to provide regular communication regarding DMHS available. The research findings obtained in this study are in accord with the literature that communication is an integral part of social sustainability strategies. Scott and Mars (2013:9) and Parra et al. (2016:13292) highlight the significance of effective communication in ensuring informed decision-making and increasing the acceptability of e-health tools. For University X, effective communication should therefore be recognised as an important social sustainability strategy for long-term utilisation of e-health tools for DMHS.

The mean value of 2.27 with a SD of 1.378 indicated that respondents tended to slightly agree with some variability that their university needs to provide DMHS in different languages. In view of this, multilingual services are regarded as important for ease of access to DMHS which reflects language diversity in SA. This is supported by research findings, with researchers such as James and Versteeg (2007) advocating for the delivery of DMHS in multiple languages

in SA to address language barriers which help to ensure that DMHS become more inclusive and accessible to all.

The respondents showed strong agreement that DMHS should be supported with traditional face-to-face services considering the mean value of 1.87 with a SD of 1.192. The findings obtained in this study coincide with the works of Noar and Harrington (2012:10) and Brenes et al. (2011:8) who suggest that combining e-health tools with traditional services would help to ensure comprehensive care, particularly for severe mental health issues. For University X, the delivery of DMHS with the support of some face-to-face services would enhance the overall effectiveness and acceptability of DMHS.

The value of 2.07 with a SD of 1.296 demonstrates moderate agreement among the respondents that regularly collecting user feedback is essential for assessing the effectiveness of DMHS. These findings are supported by Balcombe and De Leo (2021:7) who stress that regular assessments and collection of user feedback are essential for determining areas for improvement which allows e-health tools to remain effective and user-friendly.

The respondents showed strong agreement on the necessity of top management support (mean = 1.86 and SD of 1.200). The findings are consistent with Han et al. (2020:7) and Al-Mamary et al. (2014:123) who emphasise the importance of proactive leadership in managing resources and motivating staff which is crucial in driving the sustainable adoption of e-health tools effectively.

The respondents indicated a moderate agreement as showed by a mean of 2.26 with a SD of 1.492 on the need for more resources such as alternative sources of electricity, ICT infrastructure, and financial and human resources to deliver DMHS effectively. The research findings reflect the literature which highlights the significance of resource availability for effective service delivery to facilitate the sustainable adoption of e-health tools (Fanta & Pretorius, 2018:140). It is therefore beneficial for University X to consider utilising renewable energy sources such as solar power and install backup generators to facilitate uninterrupted and effective delivery of DMHS through e-health tools, while simultaneously addressing environmental challenges and supporting sustainability as well (Azimoh et al. 2017:230).

The respondents also expressed moderate agreement regarding the necessity of data management and security systems (mean = 2.07 and SD = 1.350) and data privacy and security policies (mean = 2.23 and SD = 1.537). The research findings of this study correlate with concerns highlighted in the literature by Martinez-Martin and Kreitmair (2018:2) and Stoll et al. (2020:9). In this regard, University X should therefore consider implementing robust

security measures including policies and adhere to data privacy regulations to protect sensitive mental health data when using e-health tools to deliver DMHS (Stoll et al. 2020:9; Scott & Mars, 2013:11).

8.4 Discussion of factors identified from EFA

EFA was employed in this study, resulting in the identification of six key factors. The analysis of these six factors revealed the following:

8.4.1 Factor one: Current state of the adoption of e-health tools

The study identified the current state of adoption of e-health tools as the first factor related to the sustainable adoption of e-health tools. The Cronbach's Alpha confirmed an acceptable internal consistency of 0.682. The AVE value was 0.445 and this value indicated that the items in this factor explained 44.5% of the variance. This result was also acceptable. Moreover, the CR was 0.700, demonstrating that the items in this factor were reliable and acceptable to this study. As indicated by high factor loadings (greater than 0.4), three items were identified as contributing significantly to the factor representing the current state of adoption of e-health tools. These items included, the awareness of free DMHS with a factor loading of 0.628, awareness of service providers with a factor loading of 0.661 and awareness of 4IR technologies for DMHS with a factor loading of 0.524. The high factor loadings suggested that these items are strongly related to the factor and this indicated their importance towards a better understanding of the current state of adoption of e-health tools. The section that follows provides a discussion of these items in relation to and in comparison, with the existing literature. The discussion also extends to the factors that did not load significantly on the current state of adoption factor, thus providing a complete understanding of the research findings.

Findings from this study show that awareness of free DMHS is related to the current state of the adoption of e-health tools (factor loading = 0.628). Awareness of free DMHS refers to how well university staff are informed and knowledgeable about the accessibility, benefits and availability of DMHS free of charge at their university. The research findings align with the literature review which highlights increased awareness of free DMHS during the pandemic due to heightened mental health needs and online engagement. Further evidence supporting this trend at University X is drawn from the significant literature on the rapid establishment and provision of free DMHS by various external service providers as well as University X's own initiatives.

The study also identified awareness of service providers as part of the current state of adoption factor (factor loading = 0.661). Awareness of service providers refers to the knowledge and understanding university staff have about organisations providing DMHS. The literature review noted various collaborations and partnerships during the COVID-19 pandemic between Higher Health, SADAG, Momentum Wellness and University X itself to provide free DMHS for staff members. In light of this, it is evident that the findings of this study support the literature, highlighting the importance of awareness of specific service providers within the broader knowledge of free DMHS. The research findings suggest that awareness of service providers plays a significant role in building trust and credibility which can impact the decisions of university staff regarding the sustainable adoption of e-health tools particularly those used by reputable and recognised service providers.

Awareness of 4IR technologies for DMHS is another item that significantly emerged from the study findings and is associated with the current state of the adoption of e-health tools (factor loading = 0.524). Awareness of 4IR technologies refers to the understanding and knowledge that university staff have regarding innovative and advanced technologies that are applicable and capable of delivering DMHS. The research findings are consistent with the reviewed literature concerning the transformative impact of 4IR technologies on health care delivery (Gomes de Melo e Castro e Melo and Araújo, 2020:328). The literature review focused on 4IR technologies such as artificial intelligence, machine learning, virtual reality, the Internet of Things and cloud computing, all of which were acknowledged as some of the tools impacting and improving DMHS. Accordingly, research findings demonstrate that respondents are cognisant of the significant value, role, and benefits provided by innovative and advanced technologies in the delivery of DMHS as evidenced by the awareness of 4IR technologies.

The study investigated internet access in relation to the current state of the adoption of e-health tools for DMHS. Studies show that the utilisation of e-health tools is increasingly gaining popularity worldwide as various countries are realising that modern ICTs and internet access have since become an inseparable part of daily life (Aungst & Patel, 2020:1). Contrary to these findings, this study could not identify stable internet access at home as an item relating to the current state of adoption of e-health tools for DMHS. Moreover, the findings of the study showed that respondents were concerned about internet costs when using e-health tools to access DMHS. This follows that these items did not load significantly on the current state of adoption of e-health tools factor. There are several possible reasons for these study findings, including diverse internet access patterns among university staff, cost barriers, and the likelihood that some staff may have reliable internet access at home, while others may be

experiencing limitations or intermittent connectivity that affect their use of e-health tools, leading to varied experiences.

Considering the variety of available e-health tools, their use enables the delivery of DMHS in the workplace by influencing how these services are designed, accessed, and provided in both formal and informal settings (Howarth et al. 2018:2). Surprisingly, the study found that multiple device use is not associated with the current state of the adoption of e-health tools for DMHS at University X. This follows that this item did not load significantly on the current state of adoption of e-health tools factor. Possible reasons for this surprising finding can be linked to the user behaviour and preferences. For instance, some users (university staff) may have a strong personal preference for using a single device for example a laptop to meet all their needs, including accessing digital mental services, regardless of the number of devices they own. The study findings have potential negative implications for excluding certain users (university staff) who may prefer a single device when accessing digital mental services, thus limiting reach and flexibility.

In addition to connecting individuals with similar experiences, social media platforms allow for the creation of online support groups. These groups can be beneficial to individuals experiencing mental health challenges, as they allow them to share their experiences, get support, and feel less isolated (Sawyer & Chen, 2012:165; Korda & Itani, 2013:21). However, this study could not support these findings as it was found that social media is not an item related to the current state of the adoption of e-health tools factor at University X. Put differently, social media did not load significantly on the current state of adoption of e-health tools factor. The reason could be contextual differences such as user preferences, limited need for social media support as well as privacy and security concerns. Researchers such as Giumetti and Kowalski (2022:4) state that social media can be a platform for cyberbullying and spreading false information and this could be another reason why this study might not support previous research that advocated for the benefits of social media for DMHS. Furthermore, research shows social media can lead to addiction, especially for those who spend more time socialising on the internet (Leung, 2014:435).

The study results revealed that individual preference is not an item linked with the current state of the adoption of e-health tools. This follows that this item did not load significantly on the current state of adoption of e-health tools factor. The study findings contrast the literature which affirms that internet-based e-health tools provide an alternative option for users who do not prefer to utilise traditional face-to-face services or who may have geographic restrictions that limit access (Taylor & Luce, 2003:19). Therefore, despite individual preferences, some

users (university staff) may not be interested in exploring alternative mental health options, such as e-health tools, because they are satisfied with face-to-face mental health services.

8.4.2 Factor two: Experiences gained during the COVID-19 pandemic

The second factor identified through EFA was the experiences gained during COVID-19. The Cronbach's Alpha for this factor was 0.742 and this indicated good reliability of the factor. AVE resulted in a 0.290 and this reflected the lack of convergence of observed variables on the underlying factor. However, the CR was 0.732, indicating that the items in this factor were relatively reliable. Based on the high factor loadings (greater than 0.4), seven items were identified as significantly contributing to the factor representing COVID-19 experiences. These items included benefits gained with a factor loading of 0.655, perceived usefulness of social media with a factor loading of 0.607, user satisfaction with a factor loading of 0.670, university commitment with a factor loading of 0.525, variety of DMHS with a factor loading of 0.411, post-COVID-19 delivery mode with a factor loading of 0.560 and ethical guidelines with a factor loading of 0.434. The high factor loadings demonstrated that these items were strongly correlated with the factor, thereby demonstrating their importance in understanding the experiences gained from COVID-19. The section that follows provides a discussion of these items in relation to and in comparison, with the existing literature. The discussion also extends to the factors that did not load significantly on the experiences gained during the COVID-19 factor, thus providing a complete understanding of the research findings.

In this study, the item benefits gained relate to the benefits and positive outcomes that university staff experienced during the COVID-19 as a result of using e-health tools for DMHS. One of the benefits and positive outcomes is improved mental wellbeing. As indicated by the respondents, the use of e-health tools during COVID-19 resulted in reduced anxiety, stress and depression and further increased emotional resilience and coping mechanisms. Similarly, and more recently, Sinha et al. (2023:7) reported that the use of e-health applications such as Wysa reduced anxiety and depression during COVID-19, thus supporting the findings of this study. The respondents indicated that it was beneficial to use e-health tools to access DMHS during COVID-19 (factor loading = 0.655). The findings mean that during COVID-19, e-health tools enhanced access to DMHS by removing geographical and time constraints and thereby enabling more access for University X staff. This finding is particularly relevant during the pandemic as demonstrated by Mbunge et al. (2022:7). Furthermore, the convenience of accessing e-health tools, the availability of diverse service options such as webinars, online workshops, and online resources, and potentially higher satisfaction rates were some of the factors that contributed to a positive user experience during COVID-19 at University X. Accordingly, the benefits and positive outcomes that university staff experienced during the

COVID-19 pandemic could be significant in shaping and influencing strategies for the sustainable adoption of e-health tools which coincide with global developments opting for digital mental health care (Murphy et al. 2021:169; Reingold et al. 2021:6; Sinha et al. 2023:7).

In the wake of COVID-19, social media platforms like Instagram, WhatsApp, Twitter, YouTube, LinkedIn, TikTok, Facebook and many others that allow users to interact, post photos, videos, and messages were particularly effective in connecting individuals, spreading awareness, and disseminating information about mental health issues (Saud et al. 2020:8). Building upon existing research, the research findings of this study show that social media had a substantial impact on the mental health of university staff during the pandemic, thus the findings demonstrate a positive experience gained during COVID-19 at University X (factor loading = 0.607). This could be due to social connection and support, access to information and resources as well as community building and belonging (Sawyer & Chen, 2012:165; Kruzan et al. 2022:10; Wankel et al. 2010:242). This is in line with the broader literature which highlighted and indicated a surge in the use of e-health tools and social platforms during the recent pandemic (Reingold et al. 2021:6; Murphy et al. 2021:169). In light of this, it is evident that various social media platforms played a significant role in the provision of DMHS during COVID-19 for University X staff.

The study found that users (university staff) were satisfied with DMHS and accordingly, this reflected a positive experience gained during COVID-19 at University X (factor loading = 0.670). It is thus evident that positive user satisfaction illustrates that university staff who were seeking mental health support had a valuable experience using the e-health tools during the COVID-19 pandemic at University X. According to Murphy et al. (2021:169), COVID-19 significantly increased the adoption of e-health tools, while Tebeje and Klein (2021:153) attributed this to its convenience, cost-efficiency, and accessibility. The literature review demonstrated that University X adopted a proactive approach (webinars, online workshops, and online resources), in addition to its partnership with Higher Health, SADAG, and Momentum Wellness. Altogether, it therefore seems these efforts contributed to the positive user experience. As Wang et al. (2022:224) and Sinha et al. (2023:7) noted, users were satisfied with e-health tools because they are convenient to use, and reduce anxiety and depression. Consequently, these findings support empirical evidence and this suggests that e-health tools may prove effective at providing mental healthcare in the event of a crisis such as COVID-19 which will be useful in the delivery of DMHS in the future. Therefore, positive experiences gained during COVID-19 and in this study, the user (university staff) satisfaction with e-health tools, demonstrate their potential as a valuable solution in addressing mental health needs at the university.

Apart from individual experiences, university commitment emerged as another encouraging aspect contributing to the positive experiences gained during COVID-19 at University X (factor loading = 0.525). The findings from the EFA provided supporting evidence to confirm the level of commitment shown by University X in delivering DMHS to its staff. In addition, the study also found that University X provided a variety of DMHS during COVID-19 (factor loading = 0.411). This is however not surprising considering the study findings which showed university commitment. The wide variety of DMHS aligns with the broader context presented in the literature. The study findings are congruent with the broader context of existing literature presented earlier. The findings reported that University X in partnership with Higher Health and SADAG, responded to the challenges posed by the COVID-19 pandemic by proactively embracing e-health tools for the delivery of DMHS. As discussed in the literature, a comprehensive mental health program developed by Higher Health featured initiatives for psychological resilience, peer-to-peer counselling, and a 24-hour toll-free helpline. Momentum Wellness further contributed to employee wellbeing services at University X. The employee wellbeing services consisted of psycho-social counselling, medical support through the 'Hello Doctor' application, trauma support, family care, legal advice, financial advice, debt restructuring, and on-site mobile medical clinics. Along with the digital mental health and employee wellbeing services provided by Higher Health, SADAG and Momentum Wellness, University X also provided many online mental health initiatives including webinars, online workshops, and online resources. It is evident that University X went above and beyond to ensure that university staff had access to DMHS throughout the COVID-19 pandemic, enabling additional care and support. This demonstrated the university's commitment to creating a safe and supportive environment for all staff during an unprecedented time.

The research findings showed strong agreement among respondents that e-health tools are an effective mode of delivering DMHS at University X post-COVID-19 (factor loading = 0.56). The research findings suggest that the experiences gained during COVID-19 including access to University X initiatives, Higher Health, SADAG, and Momentum Wellness services positively influenced perceptions of e-health tools for mental health care at University X. As noted in the literature, the recent pandemic largely contributed to an increase in the adoption of e-health tools in the delivery of DMHS, a trend reflected in the research findings of this study (Reingold et al. 2021:6; Murphy et al. 2021:169). At University X, it is evident that the pandemic accelerated the utilisation of e-health tools for DMHS and they are now a preferred mode post-COVID-19.

The study noted the respondents' concerns about ethical guidelines during the COVID-19 pandemic and this emerged as a key finding, further contributing to the negative experiences

gained during COVID-19 (factor loading = 0.434). This key finding suggests that despite the positive experiences gained during COVID-19 at University X, there were also some negative and significant concerns surrounding ethical guidelines. The literature review produced a plethora of empirical evidence that supports the respondents' concerns about ethical guidelines during COVID-19. First, there are concerns regarding how user information is stored, shared and protected through e-health tools (Borghouts et al. 2021:2; Wies et al. 2021:5). In this context, it is therefore possible that users (university staff) may be more reluctant and uncomfortable to disclose sensitive information due to privacy and data security concerns. Secondly, concerns have been raised in the literature about the lack of clarity and sufficiency of informed consent obtained through digital mental health platforms (Perez et al. 2019:98; Martinez-Martin & Kreitmair, 2018:4). For University X, this means users (university staff) may not fully understand the terms and conditions they agree to and this can potentially limit their autonomy and raise ethical concerns. Thirdly, there is no specific legislation governing the application of artificial intelligence in health care in SA (Naidoo et al. 2022:13). As a consequence, a lack of specific law creates uncertainty and potential vulnerability for both University X and their university staff when using e-health tools for DMHS. These challenges echo findings from prior studies conducted during the COVID-19, where increased utilisation of e-health tools correlated with heightened data security concerns and compromised patient-provider trust (Ngcobo-Sithole & Mabusela, 2022:258; Tagde et al. 2021: 52811; Bassan (2020:10). In overall, these challenges and ethical concerns can hinder and deter the sustainable adoption of e-health tools for DMHS at University X.

As Sinha et al. (2023:7) reported, mental health applications were beneficial during the COVID-19 pandemic and were further reported to reduce anxiety and depression symptoms in users. Contrary to these findings, this study could not confirm the impact of installing mental health applications during COVID-19 as a positive experience gained during the pandemic at University X. This follows that installing digital mental health applications item did not load significantly on the experiences gained during COVID-19 factor. A variety of factors may have contributed to this disparity, including potential differences in user preferences, lack of awareness, pre-existing negative perceptions of DMHS applications, as well as overall low acceptance of DMHS applications.

Researchers such as Naidoo et al. (2022:13) clearly explain that there is a lack of specific laws that deal with artificial intelligence in health care in SA and further highlight the potential risks associated with the lack of specific laws. While their concerns are valid, particularly at the national level of health care in SA, this study found that university staff's decision to use e-health tools was not influenced by the absence of a legal framework in SA. This followed the

fact that the lack of specific laws that deal with artificial intelligence in health care in SA items did not load significantly on the experiences gained during the COVID-19 factor. Therefore, the absence of a legal framework did not contribute negatively to the experiences gained during COVID-19 in the use of e-health tools for DMHS at University X. However, the lack of a legal framework may have contributed indirectly through ethical concerns as explained above.

8.4.3 Factor three: University capacity to deliver DMHS

The internal consistency for the university capacity to deliver DMHS was found to have an excellent level of reliability as indicated by a Cronbach's Alpha of 0.875. The AVE was 0.534 and this was considered acceptable. The CR was 0.85 which was also considered good and acceptable. As indicated by high factor loadings (greater than 0.4), five items were identified as contributing significantly to the factor representing the university capacity to deliver DMHS. These items include top management support with a factor loading of 0.699, availability of financial resources with a factor loading of 0.801, ability to source financial resources with a factor loading of 0.735, ICT knowledge with a factor loading of 0.791 and technical support with a factor loading 0.746. The high factor loadings suggested that these items are strongly related to the university capacity to deliver the DMHS factor. The section that follows provides a discussion of these items in relation to and in comparison, with the existing literature.

University capacity to deliver DMHS relates to the organisational factors that influence the sustainable adoption of e-health tools. The study found that top management at University X is likely to be interested in supporting the sustainable adoption of e-health tools for DMHS (factor loading = 0.699). This key finding is consistent with the existing literature which highlights the crucial role of top management support in technology adoption. Johnson and Diman (2017:13) who are supported by Walker and Brown (2020:8) highlight the crucial role of top management in resource allocation and driving change which ultimately leads to successful technology adoption within the organisation. Han et al. (2020: 8) further emphasise the ability of top management to act as advocates for change which essentially shapes the trajectory of adoption of technology. The study findings suggest that leveraging top management support is key for the long-term use of e-health tools in delivering DMHS at University X.

Research findings showed that University X is likely to have the financial resources to support the delivery of DMHS (factor loading = 0.801). Moreover, the study findings revealed that University X's financial resources are necessary towards supporting the delivery of DMHS (factor loading = 0.735). Accordingly, the findings obtained in this study are in line with recent

studies which report the significant role of financial resources in resource-constrained settings (Hiran & Henten, 2020:445; Fagherazzi et al. 2020:6). Financial resources are required to cover various consulting, technical, and operational costs for digital healthcare initiatives. The failure to meet financial resources can deter the university from embracing e-health tools for the provision of DMHS (Fagherazzi et al. 2020:6; Johnson & Diman, 2017:14). In view of this, the study findings imply that University X's perceived financial stability may serve as an important and significant enabler for sustainable adoption of e-health tools in delivering DMHS.

The study also found that relevant ICT knowledge of university staff is important for the long-term use of e-health tools DMHS at University X (factor loading = 0.791). Furthermore, the study findings indicated that the availability of technical support to assist staff is another essential aspect for the long-term use of e-health tools DMHS at University X (factor loading = 0.746). These research findings have ample support from previous empirical research studies. For instance, research by Jere and Ngidi (2020:3) as well as research by Walker and Brown (2019:6) stresses the importance and significance of employees with ICT knowledge in organisations for the successful adoption of technology, particularly in large institutions such as SA HEIs with established ICT departments. The research findings therefore affirm the view that employees with ICT knowledge and who are able to provide technical support can influence the long-term use of e-health tools for DMHS at University X.

8.4.4 Factor four: Perceived benefits and importance of e-health tools

The internal consistency of the perceived benefits and importance of e-health tools factor was found to have an excellent level of reliability as indicated by a Cronbach's Alpha of 0.853. The AVE was 0.290 and this highlighted that this factor accounted for only 29% of the variance in the construct. The CR was high at 0.864 and this demonstrated that the items in this factor were reliable and acceptable to this study. As revealed by high factor loadings (greater than 0.4), five items were identified as contributing significantly to the factor representing the perceived benefits and importance of e-health tools. These items include perceived usefulness with a factor loading of 0.693, perceived ease of use with a factor loading of 0.799, attitude towards use with a factor loading of 0.586, behavioural intention with a factor loading of 0.601 and relative advantage with a factor loading of 0.783. The high factor loadings demonstrated that these items are strongly related to the perceived benefits and importance of the e-health tools factor. The section that follows provides a discussion of these items in relation to and in comparison, with the existing literature.

The study confirmed that perceived usefulness influences the sustainable adoption of e-health tools for DMHS (factor loading = 0.693). The study findings align with the importance and

significance of perceived usefulness in technology adoption (Davis, 1989:320). Perceived usefulness reflects the extent to which a user is confident in embracing and utilising certain technologies to improve performance outcomes. In the context of this study, it signifies the university staff's confidence that e-health tools can support the provision and delivery of DMHS and ultimately help to address mental health challenges at the university. Accordingly, the study findings suggest that perceived usefulness contributes towards enhancing and fostering positive attitudes towards the use of e-health tools for DMHS, resulting in improved use and sustainable adoption within the university. Moreover, perceived usefulness plays a significant role in influencing university staff's behavioural intention to embrace and use e-health tools for DMHS, as explained in the literature.

The study findings also confirm that perceived ease of use influences the sustainable adoption of e-health tools for DMHS (factor loading = 0.799). This is consistent with Davis' (1989:320) concept of perceived ease of use that drives technology adoption. As noted in the literature, "perceived ease of use refers to the degree to which an individual feels that utilising a specific system would be free of effort" (Davis, 1989:320). Melzner et al. (2014:1378) draw attention to the significance of user-friendliness of technology as a key factor in technology adoption and further argue that as ease of use increases, so does the perceived benefit. Recent studies support these arguments that perceived ease of use contributes to the sustainable adoption of e-health tools (Bamufleh et al. 2021:17). Hence, perceived ease of use is encouraging in this study as it indicates that university staff are finding it effortless to use e-health tools for accessing DMHS.

The study findings show that attitudes towards use influence the sustainable adoption of e-health tools for DMHS (factor loading = 0.586). According to Robbins et al. (2019:99), attitudes refer to evaluative statements or judgements regarding objects, people, or events and they are tied closely to a behavioural component. In the context of this study, the university staff's favourable attitude reflects their willingness to embrace e-health tools for the delivery of DMHS. Davis (1989) asserts that individual attitudes towards technology significantly impact their behaviour towards technology adoption. This assertion is corroborated by a recent study on the adoption of e-health tools (Bamufleh et al. 2021:17). The study findings indicate that university staff are receptive and potentially keen about adopting e-health tools for DMHS.

The study also found that behavioural intention to use is associated with the use of e-health tools for DMHS (factor loading = 0.601). This is consistent with the findings of the results from a recent study by Gbollie et al. (2023:18) which indicated that there is a high behavioural intention to use e-health tools for DMHS. Therefore, the study findings demonstrate the potential for e-health tools for DMHS to be widely used in the future at University X.

8.4.5 Factor five: External support to improve university capacity

Regarding external support to improve university capacity factor, Cronbach's Alpha of 0.834 indicated a good level of internal consistency. Based on the AVE of 0.490, the research findings provide evidence that the items in this factor only explained 49% of the variance in the construct. A CR of 0.823 indicated a high degree of reliability for the items in this factor and this was acceptable to this study. There were five items identified as significantly contributing to the factor representing external support necessary for university capacity based on the high factor loadings (greater than 0.4). These items include university size with a factor loading of 0.612, government support with a factor loading of 0.849, government policies with a factor loading of 0.65, competitive pressure with a factor loading of 0.58 and external support with a factor loading of 0.573. The high factor loadings demonstrated that these items are strongly related to the external support necessary for the university capacity factor. The section that follows provides a discussion of these items in relation to and in comparison, with the existing literature.

The findings of the study revealed that university size influences the long-term use of e-health tools for DMHS at University X (factor loading = 0.612). The findings confirm the assertions of previous studies that large organisations such as SA HEIs are better positioned for the sustainable adoption of e-health tools due to their inherent advantages (Ramdani et al. 2020:12; Awa & Ojiabo, 2016:918; Ramdani et al. 2013:747). Furthermore, Han et al. (2020: 7) expound that large organisations such as universities have the potential to acquire financial resources, and talent and have research and development capacity which is crucial for successful technology adoption. Accordingly, this potential as a result of University X's size serves to influence the long-term use of e-health tools for DMHS at University X.

Government support is another key factor identified in the study (factor loading =0.849). Research findings showed that government policies and regulations support universities to use e-health tools (factor loading = 0.650). In view of this, it has been demonstrated in research studies that government support of the adoption of ICTs in healthcare has a significant impact on organisations' decisions to use ICT, with policies playing a significant role in easing the adoption of e-health tools, particularly when events such as the COVID-19 occur (Han et al. 2020: 8; Fagherazzi et al. 2020:4). Thus, SA government policies and initiatives, as evident during the COVID-19 pandemic (Fagherazzi et al. 2020:4), influenced and facilitated the long-term use of e-health tools for DMHS at University X through streamlining regulations and introducing favourable government policies that created a conducive environment for the adoption of e-health tools.

This study established that competitive pressure influences the long-term use of e-health tools for DMHS at University X (factor loading = 0.580). This research finding is in line with the recognised impact of competitive pressure on technology adoption. As several studies support this, it is the external influence from competitors that compels and forces organisations and, in this study, University X to embrace technology and become more innovative, efficient and effective (Sligo et al. 2017:93; Wanyoike et al. 2012:73; El-Gohary, 2012: 1265). In the context of University X, the external pressure to enhance productivity owing to a healthy and highly driven workforce influences the university to adopt and use e-health tools for DMHS. This demonstrates the key role of competitive dynamics that drive technological advancement in the academic sector.

The study revealed that external support is another key item important for the long-term use of e-health tools for DMHS at University X (factor loading = 0.573). As Han et al. (2020: 8) note, it is difficult, challenging and demanding for an organisation to embrace technological innovations such as e-health tools without external support. Technology adoption is increasingly becoming more reliant on external assistance and outsourcing, particularly in SA HEIs, where institutions may lack the necessary technical expertise (Maphalala & Adigun, 2020:10). In this study, the external support and assistance from Higher Health, SADAG and Momentum Wellness illustrate the collaborative partnerships necessary to influence the sustainable adoption of e-health tools for DMHS at University X.

The findings revealed that compatibility is not related to the long-term use of e-health tools for DMHS at University X. This follows that this factor did not load significantly on the external support to improve the university capacity factor. The study findings can be attributed to the dynamic technological landscape and the evolving nature of e-health tools. This suggests that as various technologies continue to advance, their perception is changing among users thereby making it challenging to identify and establish their influence on the sustainable adoption of e-health tools for DMHS. In addition, the ICT infrastructure at University X and the institutional context may be unique and this perhaps impacts the perceived compatibility of e-health tools. Accordingly, the complex interplay of these reasons may have led this study to its failure to establish compatibility as a factor that influences the sustainable adoption of e-health tools for DMHS (Han et al. 2020: 7; Jere & Ngidi, 2020:3; Hiran & Henten, 2020:443).

The study also found that complexity is not linked to the long-term use of e-health tools for DMHS at University X. This follows that this factor did not load significantly on the external support to improve the university capacity factor. The possible reason for this finding could be due to the subjective and context-dependent nature of complexity. This means complexity may have differed based on the specific e-health tools investigated in this study, the ICT

infrastructure at University X, and the users (university staff) involved in the study. Thus, the study findings are contrary to the study by Han et al. (2020:7) which found that the less complicated the technology, the more an organisation is inclined to adopt it. This is consistent with the arguments put forward by Jere and Ngidi (2020:3) that the complexity of technology influences technology adoption because stakeholders in organisations would believe that complicated ICTs are too difficult to embrace and, if implemented, they would be abandoned in a short period.

8.4.6 Factor six: Strategies for the sustainable adoption of e-health tools

Another significant factor identified in this study through EFA was strategies for the sustainable adoption of e-health tools. The Cronbach's Alpha for this factor was 0.932 and this suggested that the items in this factor were strongly correlated. This result was acceptable to this study. The AVE value was 0.585, showing that the items in this factor explained 58.5% of the variance in the construct. The CR was 0.914 and this means that the items in this factor were highly reliable and acceptable to this study. There were ten items identified as significantly contributing to the factor representing strategies for the sustainable adoption of e-health tools based on the high factor loadings (greater than 0.4). These items were: stakeholders involvement with a factor loading of 0.753; training with a factor loading of 0.847; educational initiatives and awareness campaigns with a factor loading of 0.859; communication with factor loading of 0.867; language diversity with factor loading of 0.544; integration with factor loading of 0.483; top management support with factor loading of 0.676; securing additional resources with factor loading of 0.843; data management and security systems with factor loading of 0.861; and data privacy and security policies with factor loading of 0.844. The high factor loadings demonstrated that these items are strongly related to the strategies for the sustainable adoption of e-health tools factor. The section that follows provides a discussion of these items in relation to and in comparison, with the existing literature. The discussion also extends to the factors that did not load significantly on this factor, thus providing a complete understanding of the research findings.

The study findings showed that stakeholder involvement is an important strategy for the long-term use of e-health tools for DMHS at University X (factor loading = 0.753). This aligns with a study conducted by Fanta and Pretorius (2018:140) which accentuates the significance of involving and engaging users (university staff), healthcare practitioners, and other stakeholders in designing and developing e-health tools to ensure that they are effective and aligned with the needs of users. In support of this strategy, Van Dyk et al. (2012:4) propose that it is imperative to involve the key stakeholders, mainly the users (university staff), from the planning stage onwards to overcome potential resistance, improve acceptability, and

satisfy stakeholder demands. Moreover, it is crucial to also engage and collaborate with mental health professionals in the process to ensure that e-health tools are evidence-based and meet professional standards. In general, stakeholder involvement as a strategy for the sustainable adoption of e-health tools for DMHS is fundamental to addressing potential resistance and establishing contextual fit.

The study also found that training is an important strategy for the long-term use of e-health tools for DMHS at University X (factor loading = 0.847). In accordance with the findings of Baniasadi et al. (2018: 667), adequate training is essential for users (university staff) to continue using e-health tools for DMHS. This suggests training helps to ensure that users (university staff) become more capable of comprehending and effectively proficient in using e-health tools for DMHS. Tilahun and Fritz (2015:15) concur, stating that the level of training provided to users (university staff), whether internal or external, facilitates the long-term use of e-health tools for DMHS. Furthermore, scholars such as Mbunge et al. (2022:10) recommend that training should be extended to health care providers as it will help to prepare them on how to deliver DMHS using e-health tools.

The findings of the study confirmed that educational initiatives and awareness campaigns are strategies that should guide the sustainable adoption of e-health tools for DMHS (factor loading = 0.859). Studies indicate the importance of educational initiatives and awareness campaigns designed to inform and educate key stakeholders about e-health tools, particularly university staff and health care providers, by employing methods such as web-based tutorials, public education, and in-person support (Stoll et al. 2020:9). Considering this strategy, Mbunge et al. (2022:10) recommend that organisations such as universities should raise awareness about the use of e-health tools when accessing remote medical care such as DMHS, particularly in pandemic situations such as COVID-19.

This study further established that communication is a strategy that should guide the sustainable adoption of e-health tools for DMHS (factor loading = 0.867). As part of ensuring the correct utilisation of e-health tools, regularly communicating with all stakeholders is essential to promote and increase informed decision-making. It also facilitates the exchange of timely and accurate information (Scott and Mars, 2013:9; Al-Mamary et al. 2014:123). According to Parra et al. (2016:13292), who endorse this strategy, diverse communication channels, for instance, video podcasts, audio slideshows and animated videos can enhance workplace communication. Effective communication becomes indispensable in delivering DMHS, mainly in terms of debunking misinformation and conspiracies, and preventing infodemics in challenging times such as COVID-19 (Su et al. 2021:6). Accordingly,

communication as a strategy is important in advancing and increasing the acceptability of e-health tools for the delivery of DMHS.

The findings study revealed that language diversity plays an important role in advancing the long-term use of e-health tools for DMHS at University X (factor loading =0.544). James and Versteeg (2007:121) highlight that language can be a challenge to the adoption of e-health tools, particularly for non-English speakers in SA. Therefore, delivering DMHS in several multiple languages should help to improve accessibility and inclusivity at University X. This implies that a language diversity strategy will ensure an inclusive approach to meet different linguistic preferences and thereby enable an understanding of DMHS for all users (university staff). Research shows that tailoring DMHS to accommodate various linguistic groups in a multicultural country such as SA can increase the likelihood of user engagement and contribute to a more inclusive mental health care system (Swartz, Kilian, Twesigye, Attah & Chiliza, 2014:3).

The study found that integrating DMHS with traditional face-to-face services is a fundamental strategy that should guide the sustainable adoption of e-health tools (factor loading = 0.483). This integrated strategy is consistent with the view that hybrid models are more appropriate and acceptable in mental health settings, particularly for serious mental health issues (Noar & Harrington, 2012:10; Brenes et al. 2011:8). In view of this, it is evident that the integration strategy creates a more flexible and accommodating approach to addressing the different preferences and needs of university staff seeking DMHS. Additionally, it contributes to the establishment of a balanced and inclusive approach that leverages the benefits of both traditional face-to-face and digital services for better mental health service delivery.

The findings from this study showed top management support is a necessary strategy to ensure the long-term use of e-health tools for DMHS (factor loading = 0.676). Supporting the findings of this study, Han et al. (2020:7) concur with Johnson and Diman (2017:13) that as part of a sustainable implementation strategy for DMHS, the strategic role of the top management is essential. Their commitment directly impacts resource allocation, influencing financial feasibility and staff motivation. Therefore, University X should leverage top management support to secure resources, champion the adoption of e-health tools and drive stakeholder engagements.

Securing additional resources emerged from the study findings as a strategy (factor loading = 0.843). Fanta and Pretorius (2018:140) corroborate the findings of this study, emphasising the critical role of adequate resources such as electricity, ICT infrastructure, and financial and human resources for the successful implementation of e-health tools for DMHS. In view of

this, it is of paramount importance that University X invest in ICT infrastructure, such as upgrading hardware and software and developing human capital (training university staff). In addition to that, they should consider exploring renewable sources such as solar energy or backup generators due to the frequent power outages in SA. Implementing this strategy will help to ensure uninterrupted digital mental health service delivery (Azimoh et al. 2017:230). Moreover, implementing this strategy will also help ensure that concerted efforts by University X align with global trends in sustainable practices as solar energy provides environmentally friendly solutions (Kumar et al. 2023:14).

The study findings provided empirical confirmation that introducing a data privacy and security policy is a vital strategy for ensuring sustainable adoption of e-health tools for DMHS (factor loading = 0.844). The findings are therefore aligned with the view that data privacy and security policy play a significant role in promoting the safe and effective use of e-health tools (Scott & Mars, 2013:11). In the context of University X where e-health tools are being adopted for DMHS, developing a well-defined data privacy and securing policy is indispensable for the effective and appropriate data management. In addition, data privacy and security policy should provide clear guidelines that strengthen good governance and usage of the internet in the university specifically for the utilisation of e-health tools in the delivery of DMHS. Through the development of a data privacy and security policy, university staff will be protected from potential data privacy and security risks, thereby building trust among the users and ensuring that e-health tools for DMHS can be adopted sustainably and successfully.

Data management and security systems as confirmed by the study findings are key to the strategies to ensure long-term use of e-health tools for DMHS (factor loading = 0.861). This means investing in robust data management and security systems is required to ensure the effective and safe adoption of e-health tools for DMHS. Literature shows that mental health data is highly sensitive and this raises ethical concerns relating to privacy, confidentiality, and security (Martinez-Martin & Kreitmair, 2018:2). Therefore, mental health data should be protected from unauthorised access and used in an effective manner. In order to safeguard sensitive mental health data from unauthorised access, breaches, and misuse, University X must implement secure systems and protocols. Furthermore, University X should develop clear processes for data management and maintain an ICT infrastructure that is stable and reliable in order to ensure seamless functioning of e-health tools and to avoid technical challenges (Al-Mamary et al. 2014:122; Fanta & Pretorius, 2018:139; Gorla et al. 2010:213).

According to Balcombe and De Leo (2021:7), organisations must also undergo an evaluation process to ensure the effectiveness of e-health tools for DMHS. This suggests that it is vital to regularly assess the effectiveness of e-health tools by collecting user feedback to identify

areas that require improvement and thereby implement the appropriate changes timely. However, contrary to the study of Balcombe and De Leo (2021:7), this study could not establish continuous evaluation and improvement as a strategy that should guide the sustainable adoption of e-health tools for DMHS. This follows that this factor did not load significantly on the strategies that should guide the sustainable adoption of e-health tools factor. There might be a reason for this implicit understanding by respondents. They may have seen the collection of user feedback as part of a broader, ongoing improvement process, and did not consider it as requiring a separate strategy. In addition, respondents may have seen the 'continuous evaluation and improvement' strategy as an integral part of other strategies previously identified, such as training and stakeholder involvement, and as a means of reinforcing their effectiveness.

The study produced unexpected findings as it found that funding is not a strategy that should guide the sustainable adoption of e-health tools for DMHS. This item did not load significantly on the strategies that should guide sustainable adoption of e-health tools factor. Despite the unexpected study findings, existing literature strongly supports funding as an essential part of the broader strategies for the long-term use of e-health tools for DMHS. Mbunge et al. (2022:8) explain that funding is important for the procurement of equipment, software and scaling up of technologies, hence without funding, it can be challenging and difficult to sustainably adopt e-health tools for DMHS. To achieve economic sustainability, Jones et al. (2011:4) stress the need for diverse funding sources and partnerships, particularly private and public organisations. In light of this, it may be necessary to establish partnerships with hospitals, clinics, and service providers to integrate e-health tools into existing systems, and funding will be needed in order to facilitate collaboration and reach a broader audience. In addition, the literature showed that increasing funding is key for research and development (Mbunge et al. 2022:10).

Ricciardi et al. (2013:378) affirm that financial incentives encourage the sustainable adoption of e-health tools. This means financial incentives help to promote and facilitate the usage of e-health tools by offering rewards to users. Despite these arguments from the literature, this study could not establish that financial incentives should be part of the strategies that should guide the sustainable adoption of e-health tools for DMHS at University X. The item did not load significantly on the strategies that should guide sustainable adoption of e-health tools factor. The reasons could be that the financial incentives vary based on institutional, cultural norms and ethical concerns at University X and as a result, there may be a need for tailored approaches other than financial incentives.

The literature review highlighted the significant role of affordability as an economic sustainability strategy. Khoja et al. (2013:50) for instance, contended that affordability is key to bridging the digital divide and ensuring that users (university staff) have equitable access to DMHS. Leon et al. (2012:10) are of the view that affordability is essential for the internet connection and the e-health system procurement prices. Other studies concur, adding that as Wi-Fi hotspots expand in metropolitan areas, organisations such as SA HEIs must partner with internet providers to expand networks in areas with limited internet access and thereby close the digital gap (Mbunge et al. 2022:10). However, this study could not confirm that affordability should be a strategy for the long-term use of e-health tools for DMHS at University X. This follows the fact that the item did not load significantly on the strategies that should guide sustainable adoption of e-health tools factor. The reason could be that affordability covers various aspects such as device costs, data plans, and access to the internet all of which might not have been included as single items.

8.5 Discussions of the study tested hypotheses

In Table 8.1 below, the hypothesised relationships are presented, and the next section discusses the findings of the tests.

Table 8.1: Findings of the hypothesised relationships

Hypotheses	β	S.E.	C.R.	*P*	Findings
A positive relationship does exist between the factors that influence sustainable adoption of e-health tools in delivering DMHS in SA universities and strategies for the sustainable adoption of e-health tools to deliver DMHS.	1.216	0.131	9.269	***	Supported
A positive relationship does exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.	0.064	0.09	0.714	0.475	Not supported
A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and factors that influence the sustainable adoption of e-health tools in delivering DMHS.	-0.332	0.16	-2.078	0.038	Supported
A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and strategies for the sustainable adoption of e-health tools in delivering DMHS.	0.189	0.098	1.918	0.055	Supported

8.5.1 Hypothesis for sub-problem 1

A positive relationship does exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS in SA universities and strategies for the sustainable adoption of e-health tools to deliver DMHS.

Based on the SEM results, the study supports the hypothesis for subproblem 1 as presented in Table 8.1 above. The findings showed that the estimated coefficient for the path from “factors that influence the sustainable adoption of e-health tools” to “strategies for the sustainable adoption of e-health tools” is statistically significant (β = 1.216, SE = 0.131, CR = 9.269, p < 0.001). The positive relationship suggests that as the factors that influence the sustainable adoption of e-health tools increase, the strategies for the sustainable adoption of e-health tools also increase. Thus, factors that influence the sustainable adoption of e-health tools positively impact strategies for the university’s capacity to provide ongoing DMHS that benefit university staff over a long period through e-health tools, while still being able to address future mental health needs. It is therefore evident that university X may be better positioned to develop and implement effective strategies for the long-term use of e-health tools for DMHS now that there is an enhanced understanding of factors influencing the sustainable adoption of e-health tools for DMHS. The findings obtained in this study align with existing literature on sustainable adoption of e-health tools which emphasise the importance of understanding factors that influence technology adoption for the sustainable adoption of e-health tools (Tornatzky et al. 1990; Davis, 1989:320). In view of this, University X therefore needs to prioritise addressing these factors in order to develop robust strategies for the effective use of e-health tools for DMHS for its staff.

8.5.2 Hypothesis for sub-problem 2

A positive relationship does exist on how the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.

As displayed in Table 8.1 above, the SEM model findings do not support the hypothesis for subproblem 2. The findings (β = 0.064, SE = 0.09, CR = 0.714, p = 0.475) for the path from “experiences gained during COVID-19” to “current state of adoption of e-health tools” is not statistically significant. This means that there is no positive relationship between the current state of adoption of e-health tools and the impact of the COVID-19 experiences on the future sustainable adoption of e-health tools. Thus, the findings indicate that, while potentially valuable, the experiences gained during the COVID-19 pandemic were not statistically

significant in influencing the sustainable adoption of e-health tools at University X. Some of the user experiences from the literature reviewed include, among others, the significant increase in the use of e-health tools during the pandemic, increased patient satisfaction, increased utilisation of artificial intelligence-driven mental health applications, the need for standard protocols and systems capable of handling a wide range of remote interventions as well as increased ethical concerns related to the utilisation of e-health tools (Reingold et al. 2021:6; Wang et al. 2022:224; Sinha et al. 2023:1; Ngcobo-Sithole & Mabusela, 2022:257). Based on the study findings, it appears that, although potentially valuable, these COVID-19 pandemic experiences as discussed in the literature did not have a statistically significant impact on the sustainable adoption of e-health at University X. Several factors may have contributed to the findings of this research study for instance, the literature on the impact of COVID-19 on the sustainable adoption of e-health tools is still in its infancy and the specific COVID-19 experiences of University X cannot be generalised. In addition, the questionnaire items utilised in this study may not have effectively reflected different aspects of university staff COVID-19 experiences and their impact on the sustainable adoption strategies.

8.5.3 Hypothesis for sub-problem 3

A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and factors that influence the sustainable adoption of e-health tools to deliver DMHS.

The SEM findings provide support for the hypothesis for subproblem 3 as presented in Table 8.1 above. The path from “factors that influence the sustainable adoption of e-health tools” to “current state of adoption” is statistically significant (β = -0.332, SE = 0.16, CR = -2078, p = 0.038). However, the direction or relationship is negative. Therefore, taking into account the tested hypothesis in which there is a positive relationship between the current state adoption of e-health tools and factors influencing sustainable adoption, the negative estimate of -0.332 indicates an inverse relationship. In other words, the findings suggest that as the factors influencing sustainable adoption increase, the current state of adoption tends to decrease. It is therefore important to note that despite the findings being contrary to the theory, the study notes that the p-value of 0.038 is below the threshold for statistical significance 0.05, which indicates that the relationship between these variables is statistically significant. A number of reasons can account for the observed negative relationship. Firstly, it is possible that while University X focused more on the factors influencing the sustainable adoption of e-health tools, the actual adoption may have momentarily decreased. This could be attributed to the initial challenges and changes related to the integration of strategies for the sustainable adoption of e-health tools during COVID-19. Secondly, it is imperative to highlight that the findings are

based on a specific dataset and context, and the interpretation is informed by the comprehensive theoretical framework presented in the literature reviewed. As explained in the literature, no single technology adoption theory could adequately explain the sustainable adoption of e-health tools, resulting in the study utilising integrated constructs of the TOE framework and TAM model as well as other theoretical elements from the literature review. Considering the unique characteristics of SA universities and their adoption of e-health tools, the negative relationship observed in the SEM results may warrant further exploration.

8.5.4 Hypothesis for sub-problem 4

A positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and strategies for the sustainable adoption of e-health tools to deliver DMHS.

According to Table 8.1 above, the path analysis showed a statistically significant positive relationship between the current state of adoption of e-health tools and strategies for sustainable adoption of e-health tools (β = 0.189, SE = 0.098, CR = 1.918, p = 0.055). As a result, the H_4 was supported. Despite this, the findings indicate that the path coefficient is relatively small and this suggests that the relationship is marginally significant (supported at a 10% level). This means that factors other than the current state of adoption of e-health tools may also have a role in determining the sustainability strategies for the sustainable adoption of e-health tools. Insights gained from the literature review earlier provided support for the findings of this study as it established that the current state of the adoption of e-health tools in SA HEIs is determined by the availability, quality, and cost of internet access (Aungst & Patel, 2020:1; Gainsbury & Blaszczynski, 2011:491). Considering the challenges associated with internet access, e-health tools for DMHS may not be universally accessible and this may cause inequities in mental health care access for many university staff (Gillwald, Mothobi & Rademan, 2018:97).

As part of the e-health initiative, literature review demonstrated that several electronic health tools, including desktop computers, laptops, smartphones, tablets, and other mobile devices and applications, as well as social media platforms, have been increasingly utilised as a means of connecting individuals, spreading awareness, and disseminating information regarding mental health issues, particularly during the COVID-19 outbreak (Saud et al. 2020:8; Kruzan et al. 2022:10). The literature review also discussed various economic, social, environmental, and technological sustainability strategies for the adoption e-health tools. It was concluded in the literature review that for sustainability strategies to be successful, a good

understanding and solid foundation of the current state of the adoption of e-health tools is essential.

8.6 Summary

Beginning with a demographic analysis of the 348 university staff members who participated in the study, this chapter discussed, interpreted, and eventually derived important information from the research findings. The analysis of demographic information revealed that the research sample comprised a slight female majority which suggested that women may be more receptive to the use of e-health tools due to their higher seeking behaviours and engagement with DMHS. A diverse racial distribution was observed, with a significant proportion of respondents of African, Coloured, Indian, and White descent, suggesting the need for culturally sensitive strategies for the future utilisation of e-health tools for DMHS at University X.

The analysis further revealed that there was a particularly large representation among those aged 40-49, which demonstrated the importance of user-friendly interfaces for Generation X while leveraging advanced features for younger and tech-savvy generations. The majority of university staff held a master's degree and this suggested higher educational levels that can help facilitate the sustainable adoption of e-health tools. Academic staff who made up the majority of the university staff for this study indicated that DMHS could significantly support this group as they often experience high stress and workload in the work environment. The majority of university staff were employed on permanent contracts and this indicated a stable user base for e-health tools for DMHS. Finally, the diverse length of service among the university staff at University X demonstrated varying adoption levels of e-health tools with new staff potentially open to the use of e-health tools for DMHS.

The second section of the discussion of research findings focused on descriptive statistics. In terms of the current state of the adoption of e-health tools, university staff reported that they have stable internet access at home but concerns regarding internet cost posed a significant barrier to the continuing use of e-health tools for DMHS. The high utilisation of multiple devices and social media platforms demonstrated readiness among the university staff for the adoption of e-health tools for DMHS. Moreover, university staff indicated a moderate level of engagement in searching for DMHS. However, awareness of free DMHS, service providers and 4IR technologies remained low. Despite this, university staff showed a clear preference for DMHS over traditional in-person mental health services.

The descriptive statistics revealed that university staff had a positive experience in using e-health tools for their mental health during the COVID-19 pandemic. Main insights include the strong agreement among university staff on the usefulness of e-health tools for mental health services and social media platforms. University staff reported their satisfaction with e-health tools and this highlighted their effectiveness and convenience. However, university staff expressed moderate concerns regarding university commitment and the variety of DMHS and these research findings indicated these areas need further improvement from University X in the future. Installation of digital mental health applications was low and this indicated some scepticism or a lack of awareness among university staff regarding the role of AI in DMHS. University staff expressed their concerns regarding the absence of a legal framework and ethical guidelines for DMHS in SA, highlighting areas for improvement. The university staff showed a strong preference for continuing with DMHS post-COVID-19, in the near future.

With regards to factors that influence the sustainable adoption of e-health tools, the discussion of descriptive statistics showed that university staff perceived the e-health tools as useful, and easy to use and that they foster positive attitudes towards their adoption. In addition, the university staff displayed a positive behavioural intention to use e-health tools in the future for DMHS. Compatibility with existing ICT infrastructure and university size were perceived as enablers by the university staff. However, complexity, financial capacity and ICT knowledge received mixed perceptions and were noted as barriers to the sustainable adoption of e-health tools. Government support and government policies and regulations were perceived positively by the university staff. Apart from that, university staff also positively perceived the delivery of e-health tools DMHS as strategically valuable for University X to remain competitive. Finally, external support and partnerships were deemed essential for the sustainable adoption of e-health tools for DMHS.

The analysis of the descriptive statistics for the strategies for e-health tools revealed a strong agreement on the importance of partnerships with private and public organisations and expanding internet access through partnerships with providers. University staff viewed training, regular communication and stakeholder involvement as essential strategies. In addition, university staff perceived the integration of DMHS with traditional face-to-face services as an important social sustainability strategy for inclusivity and effectiveness. Regular user feedback and top management support were agreed by the university staff as significant strategies for ongoing improvement. Furthermore, the university staff perceived robust data management and security systems and adherence to data privacy and security policies as essential strategies for the adoption of e-health tools. However, university staff negatively perceived the use of offering financial incentives, multilingual services and additional

resources as strategies for the long-term adoption of e-health tools for DMHS. Put differently, these strategies were not viewed as highly effective by the university staff for promoting the long-term adoption of e-health tools contrary to the literature review. In view of this, University X should rather focus on other strategies to support the ongoing use of DMHS that benefit university staff through e-health tools.

The third section of this chapter discussed research findings that emerged from EFA, particularly the six identified factors related to the sustainable adoption of e-health tools for DMHS. Factor one, the current state of adoption, showed acceptable internal consistency. It is composed of three significant items with each showing high factor loadings and these included awareness of free DMHS, service providers and 4IR technologies. However, as broadly discussed, items such as internet access, internet costs, multiple device use, social media, searching for DMHS and individual preferences did not show significant correlations with the current state of adoption of e-health tools factor.

Factor two, experiences gained during COVID-19, also showed good reliability. High factor loadings confirmed significant contributions from seven items: benefits gained, perceived usefulness of social media, user satisfaction, university commitment, variety of DMHS, post-COVID-19 delivery mode and ethical guidelines. However, university staff raised ethical concerns and low acceptance of mental health applications which then indicated the need to address user privacy and data security aspects to ensure long-term use of e-health tools.

Factor three, the university capacity to deliver DMHS, showed excellent reliability. Significant contributing items included top management support, availability of financial resources, ability to source financial resources, ICT knowledge and technical support. The research findings demonstrated that these items are important in ensuring the sustainable adoption of e-health tools for DMHS.

Factor four, perceived benefits and importance of e-health tools, revealed excellent reliability. The factor comprised of five significant items: perceived usefulness, perceived ease of use, attitude towards use, behavioural intention to use, and relative advantage. As broadly discussed, these items strongly correlated with the factor, demonstrating the confidence of university staff in the usefulness and ease of use of e-health tools. This in turn positively influences their attitudes and behavioural intention towards the use of e-health tools for DMHS.

Factor five, external support to improve university capacity, showed excellent internal consistency. Five items significantly contributed to this factor including: university size, government support, government policies and regulations, competitive pressure, and external

support. Research findings as discussed demonstrated that larger universities, supportive government policies and regulations as well as external pressure are all vital for the long-term use of e-health tools for DMHS. In addition, external collaborations and assistance are also essential in this context.

Factor six, “strategies for the sustainable adoption of e-health tools”, demonstrated strong internal consistency. Research findings confirmed that ten key items significantly contributed to this factor including: stakeholder involvement, training, educational initiatives and awareness campaigns, communication, language diversity, integration with traditional services, top management support, securing additional resources, data management and security systems and data privacy policies. The research findings as discussed emphasised the importance of social, environmental and technological strategies to ensure the long-term use of e-health tools for DMHS.

The last section of this chapter focused on discussing the tested hypotheses. As discussed, the study found strong support for hypothesis 1 and this indicated a strong positive relationship between factors influencing the adoption of e-health tools and strategies for the sustainable adoption of e-health tools. Hypothesis 2 was not supported, as experiences from the COVID-19 pandemic did not significantly impact the sustainable adoption of these tools. Hypothesis 3 was supported. However, it showed a negative relationship, where an increase in influencing factors led to a decrease in the current state of adoption of e-health tools. Finally, hypothesis 4 was marginally supported as it revealed a weak positive relationship between the current state of adoption and strategies for sustainable adoption. This suggested that other factors may also play a role in determining sustainability strategies.

The following chapter presents a framework model for the sustainable adoption of e-health tools in delivering DMHS, drawing largely on the research findings as discussed and additional perspectives provided by the reviewed literature.

CHAPTER NINE

A FRAMEWORK FOR THE SUSTAINABLE ADOPTION OF E-HEALTH TOOLS IN DELIVERING DMHS AT A SELECTED SA UNIVERSITY

9.1 Introduction

This chapter follows Chapter Eight which presented the research findings by discussing and interpreting them quantitatively. The proposed framework is therefore presented and discussed in this chapter. It includes details of how the sustainable adoption of e-health tools could enable the selected university to deliver DMHS to university staff. The proposed framework draws on research findings as discussed in Chapter Eight. It incorporates key elements from the reviewed literature that contribute to the successful and sustainable adoption of e-health tools. This chapter paves the way for the next chapter which will provide an overall summary, conclusions and recommendations for the research study.

9.2 A framework for the sustainable adoption of e-health tools in delivering DMHS at a selected SA university

This study aimed to develop a framework for the sustainable adoption of e-health tools that would enable the selected university to provide DMHS to university staff. This would contribute to the continuous delivery of DMHS, mitigate workplace mental health challenges, and improve access to mental health care for university staff. Having reviewed the literature, and presented and discussed the research findings, this study proposes a framework for the sustainable adoption of e-health tools in delivering DMHS at a selected SA university, as illustrated in Figure 9.1 below.

The main components of the framework are presented, organised, and interconnected within the framework to facilitate the sustainable adoption of e-health tools for the delivery of DMHS at a selected SA university. This illustrates the structural relationship between various components of the framework. For effective interpretation, it is essential to understand the arrangement and relationships among the various elements of the framework. Therefore, the section after Figure 9.1 explains the various components of the framework.

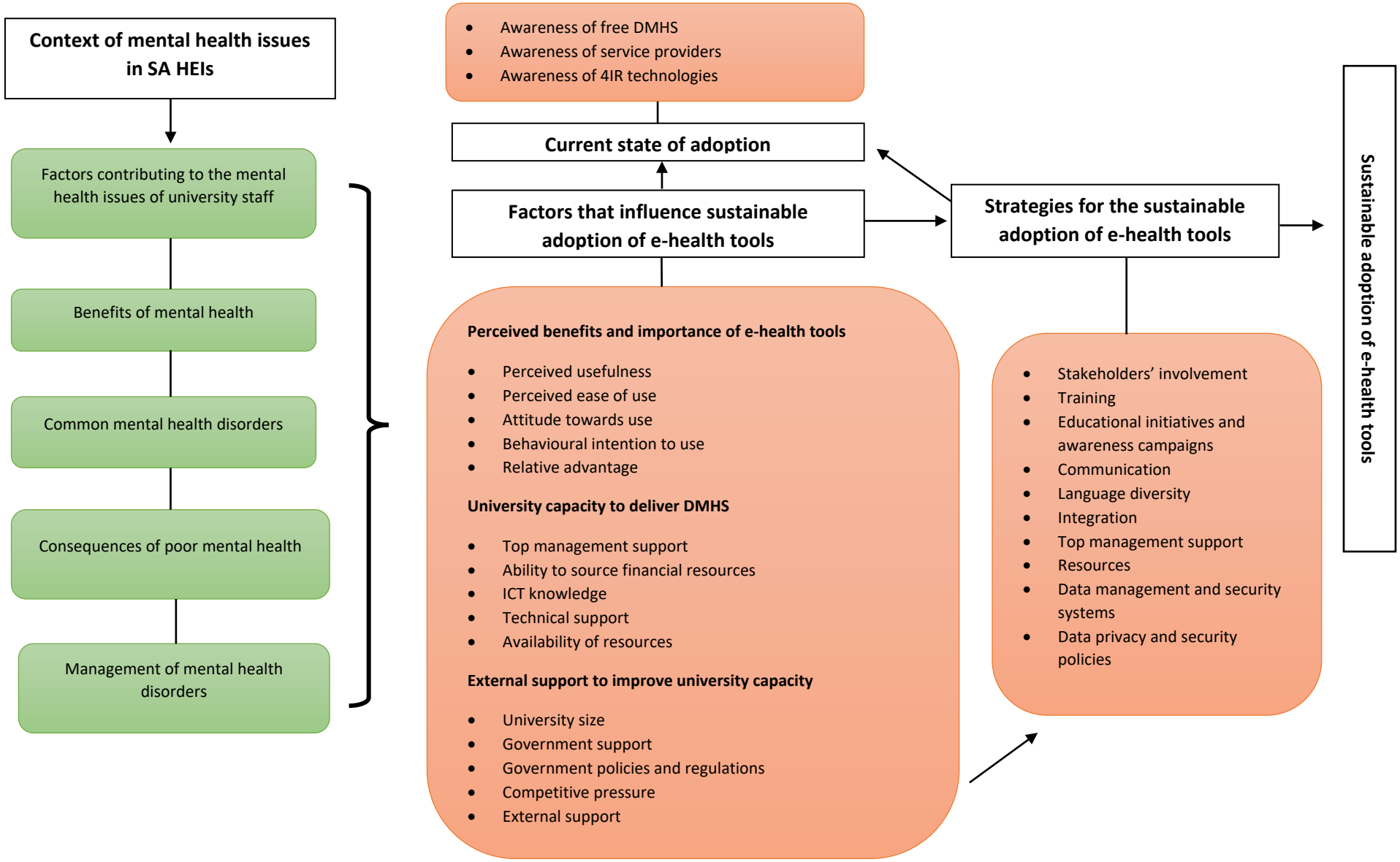


Figure 9.1: Proposed framework for the sustainable adoption of e-health tools in delivering DMHS at a selected SA university

9.3 Context of mental health issues in SA HEIs

The conceptualisation of the framework for the sustainable adoption of e-health tools in delivering DMHS at a selected SA university starts with an in-depth understanding of the context of mental health issues in SA HEIs. The key insights are imperative for key stakeholders and policymakers to make informed decisions. SA HEIs are key institutions for HE, research and social development (Ylijoki, 2013:242; Pouris & Inglesi-Lotz, 2014:1). Thus, to successfully integrate e-health tools into mental health services at University X, key stakeholders and policymakers need to understand the factors contributing to mental health issues, the benefits of mental health, common disorders, consequences of poor mental health, and the management of these conditions. In due course, this understanding will be instrumental as part of the broader efforts towards establishing an effective and sustainable e-health system for DMHS at University X. These aspects are briefly explained below.

9.3.1 Factors contributing to the mental health issues

Recognising that mental health issues are not caused by a single factor and acknowledging "the complex interplay of biological, psychological, and social factors in mental health issues" (Connellan, 2021:162; Engel, 1977:130), this study explored the multifaceted nature of mental health issues among university staff. It primarily focused on the social and environmental factors that impact university staff's mental health. Notwithstanding other contributing factors, notable factors identified and broadly discussed in the literature include poor workload management, ongoing transformation and decolonisation efforts, poor talent management practices, increased globalisation and internationalisation, and the impact of the recent COVID-19 pandemic.

9.3.2 Benefits of mental health

University X should prioritise understanding the benefits of mental health support for their staff to effectively deliver DMHS through e-health tools. Some of the benefits as broadly discussed in the literature are that it improves the wellbeing and resilience of individuals, enhances decision-making and self-actualisation of individuals, enhances job satisfaction, reduces reliance on medical interventions and promotes healthy choices which positively impacts physical health (O'Hagan & Quinn, 2018:7; Mulutsi, 2017:1). Moreover, research has shown that maintaining good mental health during challenging times such as the COVID-19 is essential for individual and societal wellbeing (UN, 2020:5). In SA HEIs, increased good mental health can lead to increased productivity, for example, more research outputs, which can benefit HEIs (WHO, 2013:21).

9.3.3 Common mental health disorders

To adopt e-health tools sustainably for DMHS, University X needs to be aware of several common mental health disorders that may impact its staff. This includes depression, anxiety, trauma, PTSD and bipolar disorder among others. Burnout and occupational stress should also be considered as they are often associated with mental health issues in HEIs. As explored in the literature, the impact of these common mental health disorders on individuals demonstrates the importance of raising awareness of each disorder among key stakeholders and policymakers within the investigated university to enable them to make informed decisions. Thus, e-health tools for DMHS can be adopted sustainably to accommodate a wide range of mental health disorders through appropriate interventions.

9.3.4 Consequences of poor mental health

The framework also highlights the consequences of poor mental health. The literature review demonstrated that failure to address mental health problems among university staff can have detrimental effects on both university staff and the university, with serious consequences across all levels (Vandayar, 2021:246). University staff may experience physical and mental health difficulties, a reduction in cognitive function, as well as behavioural changes as a result of this. These can lead to increased absenteeism, accidents, disciplinary issues, and turnover for the university among other consequences. For University X, there are considerable and potential financial implications, including sick pay, replacement costs, and training expenses among other consequences. Thus, the mental health of university staff is crucial to both their well-being and the success of the university.

9.3.5 Management of mental health disorders

The literature review showed the management of mental health disorders requires a multifaceted and integrated strategic approach as outlined by Meyer et al. (2019:27). The approach encompasses the following:

- **Pharmacological interventions**: Using medication to address underlying chemical imbalances in the brain.
- **Physical interventions**: Utilising treatments like electroconvulsive therapy for severe mental health cases.

- **Psychological interventions**: Employing therapies like CBT, psychoeducation, and family support to modify unhelpful behaviours and provide coping mechanisms.

- **Social interventions**: Facilitating social skills training, housing support, and employment assistance to minimise symptoms and promote adaptation to societal challenges.

While a comprehensive approach to mental health is essential, University X should prioritise prevention strategies through readily available social and psychological interventions. This suggests that despite being part of the approach, pharmacological and physical interventions are extreme and complex as it seems that mental health practitioners and specialists must be involved in these interventions. They can be involved through in-depth assessments and continuous monitoring, which can be outside the scope and mandate of the university. Accordingly, University X should primarily focus on accessible, evidence-based psychological and social interventions for their staff. This implies that by focusing on accessible therapies such as CBT, psychoeducation, and social support using e-health tools. University X may proactively address common mental health issues and equip university staff members with coping techniques. Through this approach, as well as referral pathways for complex cases to external specialists, the wellbeing and social integration of university staff can be significantly enhanced.

9.4 Current state of adoption

The knowledge and understanding of the context of mental health issues in SA HEIs should then be followed by the assessment of the current state of adoption of e-health tools. This assessment is essential as it will highlight existing challenges and provide insights needed to ensure the long-term use of e-health tools for DMHS in the workplace. It also allows for the identification of the potential opportunities and barriers that impact the adoption of e-health tools. Thus, providing a roadmap for the sustainable adoption of e-health tools. The research findings demonstrated that there is a relationship between the current state of the adoption of health tools and strategies for the sustainable adoption of health tools even though the relationship is not very strong. This relationship is depicted in Figure 9.1 of the framework. Furthermore, the research findings showed that the current state of the adoption of e-health tools is made up of three elements including awareness of DMHS, awareness of service providers and lastly awareness of 4IR technologies for DMHS. These elements are briefly explained below.

9.4.1 Awareness of free DMHS

Awareness of free DMHS refers to how well university staff are informed and knowledgeable about the accessibility, benefits and availability of DMHS that are free of charge at their university. It is essential as it encourages universities to utilise these services, promoting mental health care without creating financial barriers to accessing necessary support. If university staff members are uninformed and unaware of the availability of free DMHS, they may be more reluctant to seek assistance.

9.4.2 The awareness of service providers

The awareness of service providers refers to the knowledge and understanding university staff have about the organisations providing DMHS. This statement suggests that university staff should be informed about the service providers involved in providing DMHS for them to make informed decisions regarding where to seek assistance. Awareness of service providers helps in building trust and credibility, thereby impacting the decision of university staff to use e-health tools used by reputable and recognised service providers. The literature review established that many institutions were involved in the delivery of DMHS and these included SADAG, Higher Health, Momentum Wellness and University X itself. If university staff are not informed and not aware of a specific service provider, they may be more hesitant to seek mental health care even if they are aware of the DMHS available.

9.4.3 The awareness of 4IR technologies

The awareness of 4IR technologies for DMHS refers to the understanding and knowledge that university staff have regarding some of the innovative and advanced technologies that are applicable and capable of delivering DMHS. The awareness includes several 4IR technologies such as artificial intelligence, machine learning, virtual reality, the Internet of Things, cloud computing and many others that are still evolving in the delivery of DMHS.

9.5 Factors that influence sustainable adoption of e-health tools

The research confirmed that the perceived benefits and importance of e-health tools, university capacity to deliver DMHS and external support to improve university capacity are associated with the sustainable adoption of these tools. Therefore, the proposed framework integrates these factors to provide a holistic understanding of what influences the sustainable adoption of e-health tools in delivering DMHS. These factors are explained below.

9.5.1 Perceived benefits and importance of e-health tools

Perceived benefits and importance of e-health tools factors refer to the social and individual characteristics that influence an individual's willingness and ability to use e-health tools for DMHS at the university. Below are the social factors that influence the sustainable adoption of e-health tools for DMHS:

9.5.1.1 Perceived usefulness

Perceived usefulness by university staff is one of the influencing factors for the sustainable adoption of e-health tools for DMHS. Building on the definition by Davis (1989:320), high perceived usefulness therefore indicates university staff's confidence that e-health tools can support the provision and delivery of DMHS. Ultimately it helps to address mental health challenges at the university. Furthermore, confidence can also help to enhance and foster positive attitudes towards the use of e-health tools for DMHS, resulting in improved use and sustainable adoption within the university. Moreover, perceived usefulness can play a significant role in influencing university staff's behavioural intention to embrace and use e-health tools for DMHS.

9.5.1.2 Perceived ease of use

Perceived ease of use, as described by Davis (1989:320), is another important factor in the sustainable adoption of e-health tools for the delivery of DMHS. In the present study, it refers to the extent to which university staff perceive the ease with which e-health tools can deliver DMHS effortlessly. This factor is associated with the technology's 'user-friendliness,' indicating that the easier it is to utilise technology, the more beneficial it may be (Melzner et al. 2014:1378). With the present study confirming the impact of perceived ease of use on the sustainable adoption of e-health tools, University X stands to benefit as university staff will find it easier to use e-health tools for DMHS effortlessly and seamlessly (Bamufleh et al. 2021:17). Thus, a perceived lack of effort positively influences university staff attitudes and ultimately the continued use of e-health tools thereby contributing to the sustainable adoption of e-health tools.

9.5.1.3 Attitude towards use

Positive attitudes towards the use of e-health tools by university staff are fundamental to the sustainable adoption of e-health tools. Drawing on the study by Davis (1989:321), positive attitudes indicate a willingness to embrace e-health tools for the delivery of DMHS. As suggested by Robbins, Judge, Odendaal and Roodt (2019:99), this will likely reflect and translate into a

desire to use e-health tools for DMHS in the institution and eventually contribute to sustainable adoption. Thus, it is important for the university to foster positive attitudes to enhance the long-term use of e-health tools for DMHS.

9.5.1.4 Behavioural intention to use

A key influencing factor for the long-term use of e-health tools for DMHS by university staff is their behavioural intention. According to Davis (1989:321), behavioural intention reflects the likelihood of embracing technology and in this study e-health tools for DMHS. At University X, this behavioural intention is determined by perceived usefulness, perceived ease of use, and positive attitudes towards use, which culminates in the actual use of e-health tools to deliver DMHS.

9.5.1.5 Relative advantage

The relative advantages to University X because of embracing e-health tools are the benefits that university staff should receive from employing e-health tools for DMHS. Thus, the bigger the perceived relative advantages of e-health tools, the greater the likelihood of adoption (Han et al. 2020: 7). For University X, e-health tools for DMHS offer several advantages for its staff such as the ability to be customised to meet the specific needs of university staff, privacy that reduces stigma, and the ability to gain access privately (Ryan et al. 2010:74-75; Taylor & Luce, 2003:18; Bernecker et al. 2017:2). Moreover, e-health tools could be a good alternative to traditional face to face services even though ethical guidelines must be strictly adhered to for effective and sustainable adoption (Bauer et al. 2017:9).

9.5.2 University capacity to deliver DMHS

University capacity to deliver DMHS refers to the organisational factors to deliver DMHS. They are composed of factors such as top management support, financial resources and ICT knowledge, all of which contribute to the sustainable use of e-health tools for the delivery of DMHS.

9.5.2.1 Top management support

Support from top management is essential for the long-term use of e-health tools for DMHS. As Johnson and Diman (2017:13) suggest, top management has direct influence and authority to secure and allocate financial resources. Moreover, top management can advocate for change within the university (Han et al. 2020: 8). In this way, the university would then be able to secure

funding, promote training, engage and motivate its staff and ultimately, lay a good foundation for the long-term use of e-health tools for DMHS. For these reasons, it is necessary to have top management support and leverage their influence to achieve long-term success in the integration of e-health tools for DMHS at University X.

9.5.2.2 Availability of financial resources

The availability of financial resources is one of the major aspects that influence the continued use of e-health tools for DMHS. As Hiran and Henten (2020:445) and Fagherazzi et al. (2020:6) affirm, limited financial resources can severely constrain and negatively impact the delivery of digital healthcare initiatives, particularly in low-income communities. Fortunately, university staff expressed confidence that University X is likely to have the financial resources to support the delivery of DMHS. Accordingly, for University X to succeed in adopting e-health tools for the provision of DMHS in a sustainable manner, it must have stable financial resources and further allocate these financial resources strategically, explore cost-effective options and where necessary seek external funding to cover any financial gaps.

9.5.2.3 Ability to source financial resources

University staff also indicated that University X can source the financial resources required to deliver DMHS through e-health tools. Financial resources are required to cover various consulting, technical, and operational costs for digital healthcare initiatives and failure to meet financial resources can deter the university from embracing e-health tools for the provision of DMHS (Fagherazzi et al. 2020:6; Johnson & Diman, 2017:14). In view of this, the study findings imply that University X's perceived financial stability may serve as an important and significant enabler for sustainable adoption of e-health tools in delivering DMHS.

9.5.2.4 ICT knowledge

ICT knowledge is vital for the long-term use of e-health tools for DMHS. As Jere and Ngidi (2020:3) note, large organisations, such as SA HEIs often benefit from their dedicated ICT departments with highly qualified staff and external partnerships to facilitate the process of technology adoption. In contrast, small organisations usually lack ICT assistance, and this limits technology adoption (Johnson & Diman, 2017:13). Therefore, University X can take advantage of this considering their ICT knowledge, coupled with their substantial size, existing ICT

infrastructure and ability to forge external partnerships to embrace e-health tools for the provision of DMHS.

9.5.2.5 Technical support

The study confirmed that the availability of technical support to assist university staff is an essential aspect of the sustainable adoption of e-health tools at University X. The research findings as discussed earlier received ample support from previous empirical research studies with research by Jere and Ngidi (2020:3) as well as research by Walker and Brown (2019:6). They stress the importance and significance of employees with ICT knowledge in organisations for the successful adoption of technology, particularly in large institutions such as SA HEIs with established ICT departments. In this regard, University X should consider establishing a dedicated online support system to provide timely and efficient technical support for university staff which will help to ensure they are proficient in using e-health tools for DMHS.

9.5.3 External support to improve university capacity

External support to improve university capacity factors refers to the environmental factors to deliver DMHS. They are composed of factors such as university size, government support, competitive pressure and external support, all of which contribute to the sustainable use of e-health tools for the delivery of DMHS.

9.5.3.1 University size

University size has been established as a factor that influences the sustainable adoption of e-health tools for DMHS. Studies, including Han et al. (2020:7), highlight that large organisations such as SA HEIs have a significant advantage when it comes to technology adoption because they have access to resources, skilled employees with ICT knowledge, and capabilities in research and development. Accordingly, this potential as a result of University X's size serves to influence the sustainable use of e-health tools for the delivery of DMHS.

9.5.3.2 Government support

The sustainable use of e-health tools for DMHS is also influenced by the support of the government. Research by Baker (2012:151) and Han et al. (2020:8) demonstrate how government policies can have either a beneficial or a detrimental impact on the adoption and usage of ICTs in SA HEIs including those for healthcare. For University X, which is a public

institution, this is particularly significant. Thus, SA government support through initiatives, as evident during the COVID-19 pandemic (Fagherazzi et al. 2020:4), should continue to influence and facilitate the sustainable use of e-health tools for the delivery of DMHS at University X.

9.5.2.3 Government support and regulations

The study established that government policies and regulations influence the sustainable adoption of e-health tools for DMHS. Consistent with the literature, government policies and regulations have a significant impact on organisations' decisions to use ICTs, with policies and regulations playing a significant role in easing the adoption of e-health tools, particularly when events such as the COVID-19 pandemic occur (Han et al. 2020: 8; Fagherazzi et al. 2020:4). Therefore, the SA government should continue to create supportive policies and regulations to encourage the sustainable adoption of DMHS.

9.5.3.4 Competitive pressure

Competitive pressure emerged as an important aspect of the long-term use of e-health tools for DMHS. As several studies support this, it is the external influence from competitors that compels and forces organisations and, in this study, SA HEIs to embrace technology and become more innovative, efficient and effective (Sligo et al. 2017:93; Wanyoike et al. 2012:73; El-Gohary, 2012: 1265). In the context of this study, the external pressure to ensure productivity owing to a healthy and highly driven workforce influences the university to adopt and use e-health tools for DMHS.

9.5.3.5 External support

The sustainable use of e-health tools for the delivery of DMHS is also influenced by external support. As Han et al. (2020: 8) note, it is difficult and demanding for an organisation to embrace technological innovations without external support. This statement suggests that embracing complex innovations often requires external support. The external support provided to University X during COVID-19 enabled them to adopt technology to provide DMHS. Therefore, it seems likely that they would benefit more from existing partnerships with agencies such as Higher Health and service providers such as SADAG and Momentum Wellness. In this regard, these external organisations could provide the university with the mental health expertise and support required to adopt and use e-health tools for DMHS in a sustainable manner.

9.6 Strategies for the sustainable adoption of e-health tools

The proposed framework includes strategies designed to ensure the sustainable adoption and effective utilisation of e-health tools for DMHS at University X. These strategies should be applied in a way that promotes the successful and ongoing use of these tools by university staff.

9.6.1 Stakeholder's involvement

The sustainable adoption of e-health tools for DMHS relies on active stakeholder involvement. Thus, to fulfil user needs and overcome potential adoption barriers, it is necessary to involve and engage university staff, healthcare professionals, and other stakeholders in the process. Fanta and Pretorius (2018:140) and Van Dyk et al. (2012:4) emphasize the importance of commencing stakeholder involvement early, from the planning stage, design and development onwards. The main advantage is that it helps to overcome possible resistance, increase acceptance, and help to meet stakeholder expectations. Taking this sustainable adoption strategy will ensure that e-health tools meet professional standards, are user-friendly, evidence-based, and align with user expectations, as well as enhance the perception of usefulness and ease of use (Davis, 1989).

9.6.2 Training

Training plays an essential role in ensuring the effective and sustainable adoption of e-health tools for DMHS, thus making it a fundamental strategy for encouraging the effectiveness and sustainability of the adoption of e-health tools. Researchers such as Baniasadi et al. (2018: 667) and Tilahun and Fritz (2015:15) emphasize the role of adequate training for both staff and healthcare providers in driving and fostering sustainable adoption of e-health tools. Training should be provided to the university staff to ensure that they are equipped with various skills for utilising e-health tools effectively for DMHS. In addition, training should also be provided to the health care providers to prepare them to deliver DMHS by means of e-health tools and this will be consistent with recommendations from previous studies (Mbunge et al. 2022:10).

9.6.3 Educational initiatives and awareness campaigns

Implementing educational initiatives and awareness campaigns is imperative for the continuous use of e-health tools for DMHS. Mbunge et al. (2022:10) and Stoll et al. (2020:9) stress the necessity of engaging and involving users (university staff) and healthcare providers with comprehensive educational initiatives and awareness campaigns to enhance and foster sustainable adoption of e-health tools. To foster sustainable adoption of e-health tools, University

X should make use of web-based tutorials, public education, and in-person support an approach which aligns with the recommendations for fostering awareness (Stoll et al. 2020:9). Furthermore, it is also necessary to stress that educating and empowering university staff can contribute to building trust, addressing concerns, and facilitating the sustainable adoption of sustainable e-health, thereby improving university-wide access to and utilisation of DMHS particularly during challenging times like COVID-19 pandemic (Mbunge et al. 2022:10).

9.6.4 Communication

Effective communication is indispensable for the sustainable use of e-health tools for DMHS. Scott and Mars (2013:9) point out the necessity of regular and clear communication with both users (university staff) and service providers of DMHS. Al-Mamary et al. (2014:123) support these arguments and further emphasise prompt and accurate exchange of information with all relevant stakeholders to promote informed decision-making. Therefore, the university needs to leverage diverse communication channels, for instance, video podcasts, audio slideshows and animated videos (Parra et al. 2016:13292) to effectively engage with users (university staff), debunk misinformation and address any concerns. In the process, trust can be built, anxiety can be reduced, and e-health tools can be used in a coordinated manner, resulting in improved accessibility and utilisation of DMHS.

9.6.5 Language diversity

Language diversity is another important sustainability strategy for e-health tools for DMHS. Language diversity is associated with the inclusive approach necessary to meet different linguistic preferences and enable an understanding of DMHS for all users (university staff). James and Versteeg (2007:121) highlight that language can be a barrier to the adoption of e-health tools, particularly for non-English speakers in SA. Accordingly, DMHS should be provided in multiple official languages, in addition to English, to reach a broader audience and thereby ensure sustainable adoption of e-health tools.

9.6.6 Integration with traditional services

The sustainable adoption of e-health tools for DMHS also requires seamless integration with traditional services for mental health services. Researchers such as Noar and Harrington, (2012:10) and Brenes et al. (2011:8) accentuate the risks of depending entirely on e-health tools for serious mental health issues, arguing for its integration with existing services or other forms of

e-health tools for DMHS. In accordance with the studies by Noar and Harrington (2012:10) and Brenes et al. (2011:8), University X should consider combining e-health tools with other face-to-face interventions, to maximise the strengths of each approach.

9.6.7 Top management support

For the adoption of e-health tools for DMHS to be sustainable, top management support is necessary as a part of the strategies. Supporting the research findings of this study, Han et al. (2020:7) concur with Johnson and Diman (2017:13) that as part of a sustainable implementation strategy for DMHS, the strategic role of the top management is indispensable. Their commitment directly impacts resource allocation, influencing financial feasibility and staff motivation. Therefore, University X should leverage top management support so that it can secure resources, champion the adoption of e-health tools and drive stakeholder engagements.

9.6.8 Securing additional resources

Securing additional resources is necessary to sustain the use of e-health tools for DMHS. Fanta and Pretorius (2018:140) support the findings of this study, emphasising the critical role of adequate resources, including electricity, ICT infrastructure, and financial and human resources for the sustainable e-health adoption of e-health tools. Therefore, University X should consider strengthening its strategy by embracing renewable energy, such as solar power, investing in ICT infrastructure, upgrading hardware and software, developing human capital (training university staff), and preparing for power outages with backup generators (Fanta & Pretorius, 2018:140; Azimoh et al. 2017:230; Kumar et al. 2023:14).

9.6.9 Data privacy and security policy

The research study established that a robust data privacy and security policy is a vital strategy for ensuring sustainable adoption of e-health tools for DMHS. In the absence of such a strategy, the optimal use of e-health tools for DMHS at the university may be limited (Scott & Mars, 2013:11). As a result, University X must focus on the development of a well-defined data privacy and security policy that is directly intended to guide and strengthen the governance and internet usage. This policy will serve as the foundation for the responsible and sustainable adoption of e-health tools for the delivery of DMHS in the institution. Eventually, this policy will help to protect the university staff from any potential data privacy and security risks.

9.6.10 Data management and security systems

Robust data management and security systems are required to ensure the safe and effective adoption of e-health tools. It is evident from research that mental health data is highly sensitive and this raises ethical concerns related to privacy, confidentiality, and security (Martinez-Martin & Kreitmair, 2018:2). Therefore, mental health data should be protected from unauthorised access and used in an effective manner. To ensure the security and privacy of mental health data, it is important to provide university staff with adequate information, training, and support on how to use e-health tools in a secure and ethical way. Furthermore, University X should develop clear processes for data management and maintain an ICT infrastructure that is stable and reliable to ensure seamless functioning of e-health tools and avoid technical challenges (Al-Mamary et al. 2014:122; Fanta & Pretorius, 2018:139; Gorla et al. 2010:213).

9.7 Sustainable adoption of e-health tools

The successful implementation of e-health tools and adoption strategies will ensure their long-term use at University X. Upon reaching sustainability at the institution, the following benefits will be evident, as outlined in the literature review:

For users (university staff)

- **Improved access**: Sustainable adoption of e-health tools should improve access to digital mental health care in remote areas and enable users (university staff) to access a vast amount of information and services (Titov et al. 2019:1).

- **Cost-savings:** In comparison to traditional in-person consultations, the sustainable adoption of e-health tools for DMHS should lead to cost savings, since these tools increase efficiency and reduce in-person visits, particularly during challenging times such as the COVID-19 pandemic (Kane et al. 2022:2).

- **Convenience:** A sustainable adoption of e-health tools for DMHS will enable users to access their mental health services at any time and any place, thus saving both time and money (Gainsbury & Blaszczynski, 2011:491).

- **Anonymity**: For individuals who prefer seeking help anonymously due to stigma, e-health tools will enable DMHS, making access easier for those experiencing stigma or hesitation towards traditional services (Lal, 2019:57).

- **Social support**: In addition to enhancing social support, e-health tools may also facilitate the connection of individuals to online communities and platforms, since these e-health tools, through social media platforms, can positively affect people's mental health, enabling people to access social support despite distances (Blair & Abdullah, 2018:4).

- **Promote continuity**: The sustainable adoption of e-health tools, through interactive media and personalised methods, should also help to promote continuity of digital mental health care and service engagement (Lal, 2019:57).

- **Effectiveness**: Through the sustainable adoption of e-health tools, knowledge and understanding of DMHS can be enhanced and promoted, as they have the same effectiveness as face-to-face interventions for various mental health conditions, supported by evidence-based interventions that have been proven effective (Lehtimaki, et al. 2021:16; Garrido, et al. 2019:15; Gainsbury & Blaszczynski, 2011:497).

For mental health care providers:

- **Improved communication**: The long-term use of e-health tools for DMHS should result in improved patient-provider communication and allow for the dissemination of current and up-to-date mental health care information (Gomes de Melo e Castro e Melo & Araújo, 2020:328; Moock, 2014:2). It is also expected that improved communication will result in remote monitoring and communication options, particularly during challenging times such as COVID-19 pandemic (Kane et al. 2022:2).

- **Data management**: The sustainable adoption of e-health tools will also eliminate the need for a physical place to store and manage data, thus improving the efficiency and accuracy of the data management of mental health care records (Kuo, 2011:10).

- **Awareness, connections and dissemination of information**: The sustainable adoption of e-health tools would enable mental health care providers to easily share up-to-date mental health information. Moreover, social media platforms can be used to connect people, raise awareness, and provide information on mental health issues (Saud et al. 2020:8).

- **Enhanced service delivery**: The sustainable adoption of e-health tools for DMHS will allow mental health care providers to reach more university staff and improve accessibility.

For University X:

- **Improved staff well-being and productivity**: The sustainable adoption of e-health tools should help to increase access to DMHS resulting in a happier and more productive university staff.

- **Enhanced reputation and competitiveness**: Demonstrating a commitment to staff's mental health should help attract and retain talent eventually enhancing University X's reputation and competitiveness.

- **Reduced stigma and increased awareness of mental health**: The sustainable adoption of e-health tools should help to normalise help-seeking and make DMHS more accessible to all the university staff.

- **Improved overall well-being of the staff**: Over the long term, sustainable adoption of e-health tools should significantly improve access to mental healthcare for the entire university population, potentially resulting in improved overall well-being of the staff.

9.8 Summary

SA HEIs produce graduates, and generate new knowledge through research and innovation, thus making them a vital part of the country's economy. They highly depend on university staff (management, academic and non-academic) to accomplish their visions and missions. However, today's knowledge-based society makes it imperative to place a high priority on the mental health of university staff. Thus, if universities are to achieve their visions and missions, mental health needs to be well supported and promoted. In view of this, this chapter has presented a proposed framework for the sustainable adoption of e-health tools in delivering DMHS at a selected SA university. It included key details of how the sustainable adoption of e-health tools would enable the selected university to deliver DMHS to its staff. The proposed framework drew extensively on the research findings discussed in Chapter Eight and further benefitted from the additional perspectives provided by the reviewed literature. The next chapter will focus on the overall conclusions, and recommendations and further summarise the research study, taking into account the key insights gained throughout the study.

CHAPTER TEN

CONCLUSIONS, RECOMMENDATIONS AND SUMMARY

10.1 Introduction

As the final chapter of the study, this chapter commences with concluding remarks with respect to each research objective and provides a concise overview of how well the research objectives have been met. Subsequently, recommendations are provided in light of the research findings and the discussions provided in Chapters Seven and Eight. The chapter highlights the significance and contributions of the study, acknowledges the limitations of the study and reflects on their impact on the findings and conclusions. It also discusses practical implications and makes several suggestions for future research explorations. Finally, a summary of the preceding chapters is provided to end the study.

10.2 Concluding remarks with respect to the objectives of the study

There was one main research objective and four sub-research objectives in this study, and the conclusions drawn from them are discussed here:

10.2.1 Main objective of the study

The main objective of this study was to develop a framework for the sustainable adoption of e-health tools that would enable the selected university to provide DMHS to the university staff. Thus, to achieve the main objective of the study, the study integrated all the other sub-objectives into one cohesive whole to develop a framework for the sustainable adoption of e-health tools that would enable the selected institution to provide DMHS to university staff. An illustration of the proposed framework is provided in Figure 9.1 in Chapter Nine, followed by a detailed explanation of its key components. It is expected that the framework will contribute to the long-term continuous provision of DMHS, reduce the impact of mental health challenges in the workplace and enhance access to mental health care for university staff.

10.2.2 Other objectives relating to the main problem

This study also aimed to achieve the following other objectives:

Sub-objective 1

To investigate whether a positive relationship does exist between the factors that influence the sustainable adoption of e-health tools in delivering DMHS in SA universities and strategies for their sustainable adoption to deliver DMHS.

The findings of the study showed that the estimated coefficient for the path of factors that influence the sustainable adoption of e-health tools to strategies for their sustainable adoption is statistically significant (β = 1.216, SE = 0.131, CR = 9.269, $p < 0.001$). Accordingly, the research findings confirmed a positive relationship and suggested that as the factors that influence the sustainable adoption of e-health tools increase, the strategies for the current adoption and use of e-health tools also increase. In light of this finding, it is evident that factors such as perceived benefits and importance of e-health tools and the university's capacity to deliver DMHS lead directly to the development and implementation of effective strategies. These strategies are for the sustainable adoption of e-health tools for DMHS, including top management support, stakeholder engagement, and training among others.

Sub-objective 2

To investigate whether a positive relationship does exist between the experiences gained during the COVID-19 pandemic and the current state of adoption of e-health tools in delivering DMHS in SA universities.

The findings of the study did not demonstrate a statistically significant relationship between experiences gained during COVID-19 and the current state of e-health tool adoption (β = 0.064, SE = 0.09, CR = 0.714, $p = 0.475$). This means that there is no positive relationship between the current state of adoption of e-health tools and the impact of the COVID-19 experiences on the future sustainable adoption of e-health tools. In spite of the COVID-19 pandemic being the primary driver of the adoption of e-health tools in SA universities, the study findings means that its impact on sustainable adoption was limited. A number of factors may have contributed to the findings of this research study. For instance, there is limited research on the impact of COVID-19 on the sustainable adoption of e-health tools, University X's specific COVID-19 experiences cannot be generalised, questionnaire items utilised in this study may not have effectively reflected different aspects of university staff COVID-19 experiences and their impact on the sustainable adoption strategies. In addition, it is possible the adoption of e-health tools for DMHS may have been prevented by temporary changes in user needs (university staff) and COVID-19 regulations.

Sub-objective 3

To investigate whether a positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and factors that influence the sustainable adoption of e-health tools to deliver DMHS.

The research findings showed a statistically significant negative relationship between factors influencing sustainable e-health tool adoption and the current state of adoption (β = -0.332, SE = 0.16, CR = -2078, p = 0.038). The findings suggested that as the factors influencing sustainable adoption increase, the current state of adoption tends to decrease. Accordingly, this surprising finding suggested that e-health tools may have been adopted initially because of increased awareness and perceived benefits. Additionally, the importance of e-health tools, and the actual implementation may have been hindered by initial challenges, complexities and related changes to the integration of strategies for the sustainable adoption of e-health tools during COVID-19.

Sub-objective 4

To investigate whether a positive relationship does exist between the current state of adoption of e-health tools in delivering DMHS in SA universities and strategies for the sustainable adoption of e-health tools to deliver DMHS.

The research findings showed a statistically significant positive relationship between the current state of adoption of e-health tools and strategies for sustainable adoption of e-health tools (β = 0.189, SE = 0.098, CR = 1.918, p = 0.055). Despite this, the findings indicate that the path coefficient is relatively small and this suggests that the relationship is marginally significant (supported at a 10% level). This means that factors other than the current state of adoption of e-health tools may also have a role in determining the sustainability strategies for the sustainable adoption of e-health tools. Furthermore, it is evident from this finding that the mere existence of DMHS is not sufficient to ensure sustainable adoption of e-health tools, but rather effective strategies are essential to improving and ensuring sustainable adoption of tools for the provision of DMHS.

10.3 Recommendations for the study

This section provides recommendations for the study in light of the research findings presented in Chapter Seven and discussions of the research findings provided in Chapter Eight.

10.3.1 Recommendation one

University X must focus on understanding and addressing the factors that influence the sustainable adoption of e-health tools for DMHS before embracing strategies for the sustainable adoption of e-health tools. This approach will help to establish a more conducive environment for the successful implementation of these endeavours.

10.3.2 Recommendation two

To ensure sustainable adoption, University X should not depend on pre-existing pandemic experiences exclusively. Instead, they must continually assess and adjust their strategies based on user feedback and the changing needs of the university staff. This will ensure that the University can adapt to evolving user needs and preferences, as well as new technologies, to ensure that they can provide the best possible user experience. Additionally, it will enable the University to better anticipate and prepare for future pandemics.

10.3.3 Recommendation three

It is recommended that University X consider a phased approach to sustain the adoption of e-health tools for DMHS by starting with pilot programmes and addressing possible implementation challenges before broad implementation takes place. This kind of approach can assist the university in managing expectations and ensuring a seamless transition.

10.3.4 Recommendation four

University X should consider moving beyond the provision of e-health tools for DMHS by actively encouraging their use and creating an environment that will foster long-term engagement. Moreover, they should consider implementing strategies for the sustainable adoption of e-health tools to promote and improve the use of e-health tools at the university.

10.4. Significance and contributions of the research study

The study makes five-fold contributions in the form of practical, methodological, empirical, contextual and theoretical contributions in order to fill gaps in the literature. These contributions are explained below.

10.4.1 Practical contribution

Digital mental health care through e-health is a topical phenomenon, which has attracted increased academic interest in recent years. However, even though internet access in Africa has improved in recent years, issues regarding the sustainable adoption of technology-driven tools for digital mental health in developed countries, particularly in SA public HEIs, have received little academic attention. There are no studies about a framework model regarding the sustainable adoption of e-health tools aimed at digital mental health service delivery in SA universities, as per a literature search in scientific databases. As a result, this empirical study significantly contributes to the limited scientific evidence by establishing a framework for sustainable adoption of e-health technologies thereby allowing the selected institution to provide DMHS to university staff. Ultimately, this research provides valuable insights that can be applied to other universities in similar contexts.

10.4.2 Methodological contribution

A review of previous studies (Van Velthoven & Cordon, 2019: 1 – 6; Fagherazzi, Goetzinger, Rashid, Aguayo & Huiart, 2020: 1 – 6) showed that qualitative research methods and theoretical research methods were utilised to investigate the sustainability of the adoption of e-health tools for DMHS. The present study argued that quantitative research methods are necessary to generate new insights at a selected SA university and thereby understand the social world by using scientific methods that are objective and measurable (Quinlan et al. 2015:55; Bryman & Bell, 2011:17). Through quantitative research, this study effectively demonstrated the value of scientific objectivity and measurement, leading to new insights and a better understanding of the social environment at a specific South African university.

10.4.3 Empirical evidence contribution

Discussions about the utilisation of technology-driven tools for mental health continue to dominate the research agenda (Kowatsch Otto, Harperink, Cotti & Schlieter, 2019:260). Due to these ongoing discussions, empirical evidence is needed to inform policy. Therefore, this study significantly contributes towards establishing and developing evidence-based knowledge on the sustainable adoption of e-health tools for digital mental health service delivery. This evidence-based knowledge is necessary to understand the impact of technology-driven tools on mental health service delivery and to inform policy decisions in resource-constrained settings. With this knowledge, policymakers could make more informed decisions about investing in technology-

driven tools and services, and understand the implications of introducing them into existing mental health service delivery models. Thus, this study can significantly advance the achievement of SDG 3 of the UN, which aims to ensure healthy lives and promote well-being for all at all ages. Ultimately, this evidence-based knowledge could be critical in helping to create more efficient and effective use of technology-driven tools in the field of mental health.

10.4.4 Contextual contribution

Research regarding the sustainable adoption of e-health tools for DMHS in SA universities does not exist. Previous studies that report on sustainable adoption of e-health tools for digital mental health service delivery have however overlooked emerging economies such as SA, which has many public universities and a huge potential for large-scale sustainable adoption rates. An analysis of a recent study concerning the sustainable adoption of e-health for mental health service delivery showed that the study has a European-centric view (Van Velthoven & Cordon, 2019: 1-8) and there are currently no studies that focus on other parts of the world such as SA. Therefore, this study closes the contextual research gap in research concerning the sustainable adoption of e-health tools for DMHS by focusing on SA public universities. To this end, this study provides important insights that apply to a broader range of contexts. It makes a significant contribution to the literature and provides valuable insights for HEIs and policy makers on the sustainable adoption of e-health tools for the delivery of DMHS.

10.4.5 Theoretical contributions to Human Resource Management

It is evident that the study contributes to the advancement of knowledge and practice in HRM specifically in relation to wellness within the SABPP standards model, effectively filling a critical gap in the adoption of e-health tools for DMHS in SA HEIs. The study provides empirical evidence on the factors influencing the adoption of these tools and develops a framework to ensure their long-term implementation. This contributes to HRM by offering strategic insights into improving employee well-being, engagement, and productivity in university settings. From a theoretical perspective, the study integrates models such as the TOE framework and the TAM to understand the adoption of e-health tools in HRM. The findings reveal that while COVID-19 accelerated initial adoption, long-term sustainability requires targeted strategies, including institutional support, resource allocation, and user engagement. Practically, the framework serves as a guide for university HRM leaders, policymakers, and decision-makers to improve mental health support through digital solutions. Therefore, by promoting sustainable adoption of e-health tools for

DMHS, the study aligns with SDG 3 (good health and well-being), reinforcing the role of HRM in encouraging the development of healthier workplaces. Finally, the study paves the way for broader applications of digital mental health strategies in other organisational contexts beyond academia.

10.5 Study limitations, implications and suggestions for future research

In spite of the fact that the current study has provided valuable insights concerning the sustainable adoption of e-health tools that could enable the selected university to provide DMHS to university staff, it is imperative to recognise the following study limitations, reflect on the practical implications, and chart a path for future research explorations:

10.5.1 Generalisability

The research study focused exclusively on a single public university in Cape Town, SA, which limits the generalisability of the findings to other universities. Consequently, the unique characteristics of the selected university may not fully represent the broader SA HE landscape. Considering this limitation, the study findings are particularly relevant to internal stakeholders at University X, where they can implement the recommended strategies to support the long-term use of e-health tools for DMHS. Accordingly, it is recommended that future research expands the scope to include multiple SA HEIs, addressing the limitations related to the generalisability of the current study's findings. In addition, further research could explore the effectiveness and value of e-health tools for DMHS in disadvantaged institutions located in rural areas. This could have significant implications for similar institutions across Africa, potentially providing valuable information and a broader understanding of the challenges and opportunities for the sustainable adoption of e-health tools for DMHS in diverse institutional contexts.

10.5.2 Quantitative methods

Only quantitative methods were used and this limited the complexities related to the sustainable use of e-health tools for DMHS. Although the exclusive application of quantitative methods provides robust statistical data that serve as a basis for evidence-based policy decisions, future studies should consider utilising qualitative methods to further understand the subjective views and experiences of university staff regarding the sustainable adoption of e-health tools for DMHS. The use of mixed methods approaches in future studies would even be more beneficial so as to

integrate both quantitative statistics and qualitative insights related to the sustainable adoption of e-health tools in the delivery of DMHS.

10.5.3 Technology scope

While the study focused on e-health tools in delivering DMHS which are continually evolving, the study was limited to the e-health tools that include desktop computers, laptops, smartphones, tablets, and other mobile devices and applications. In addition, the investigation also extended to other various forms of e-health health tools that help to deliver DMHS including m-health, telehealth, social media, and 4IR technologies such as artificial intelligence, machine learning, virtual reality, Internet of Things and cloud computing. Hence, the study is limited, however, by the exclusion and absence of other emerging e-health technologies. In light of the rapid evolution of digital technologies, the findings of this study may not be applicable to future e-health tools. Future research should thus investigate and widen its scope to incorporate emerging technologies to gain a better understanding of DMHS in the evolving digital landscape.

10.5.4 Timeframe

As explained in Chapter Six, a cross-sectional strategy was adopted for this study. Thus, the research findings of this study are reflective of circumstances at a single point in time, rather than indicative of long-term trends or changes in the sustainable adoption of e-health tools for delivering DMHS. Therefore, longitudinal studies could be considered for future research endeavours as they would enable researchers to monitor any changes and developments over time. They may even provide a dynamic perspective on the sustainable adoption of e-health tools.

10.5.5 COVID-19 experiences

This study shows that University X did not benefit significantly from the COVID-19 pandemic experiences, even though these might have been valuable had they been realised. As a result, there is a need for further research on how universities can leverage the lessons learned from the pandemic to improve the sustainable adoption of e-health tools in delivering DMHS. There is potential for future studies to investigate specific aspects of COVID-19, including challenges encountered, successful interventions and their long-term implications for sustainable adoption.

10.6 Summary

SA HEIs are an integral part of the economy, producing graduates, generating knowledge through research and innovation, and relying heavily on university staff (management, academic, and non-academic) to accomplish their visions and missions. However, the demanding nature of the university work responsibilities, together with increased student enrolment, reduced job autonomy, increased pressure to improve national and international research publications, pressure associated with postgraduate supervision, ineffective leadership and management, and increased administrative responsibilities, have contributed to the increase in mental health concerns among university staff (Kinman & Johnson, 2019:159; Gie et al. 2017:11; Barkhuizen et al. 2014:9; Bezuidenhout & Cilliers, 2010:1). Moreover, the recent COVID-19 pandemic, as well as potential post-pandemic changes in the university work environment, have enhanced these concerns, necessitating a concerted effort to address the mental health needs of the university staff members (Inchausti et al. 2020:6).

In SA HEIs, e-health tools emerged as a potential solution for delivering mental health services to the university staff during the COVID-19 pandemic. This would reduce mental health problems while providing confidential and convenient mental health support to the university staff. However, research on the sustainable adoption of e-health tools in delivering DMHS within SA HEIs is limited. It is on this premise that the main aim was to develop a framework for the sustainable adoption of e-health tools for DMHS in a selected SA university. The development of the framework contributes to the long-term continuous delivery of DMHS, reduces the impact of mental health challenges in the workplace and enhance access to the university staff.

The study embarked on an intensive literature review in four chapters. The literature review explored the contextual overview of mental health issues in SA public HEIs, the concept of e-health tools and DMHS, the concept of sustainability and strategies for the long-term use of e-health tools and theoretical framework for the sustainable adoption of e-health tools. Among other reasons, the literature review chapters positioned the study within the current body of knowledge, conceptualised the constructs used throughout the study and provided a good foundation for the subsequent research methodology and data analysis. In essence, the literature review served as a bedrock for the conceptual framework for the sustainable adoption of e-health tools in delivering DMHS at the selected SA university.

This study adopted a case study, focusing on a single HEI in Cape Town, SA. The case study was complemented by a survey, employing quantitative research methods within a positivist research paradigm to explore the sustainable adoption of e-health tools in delivering DMHS. A deductive research approach guided hypotheses development and its empirical testing process. The study employed a voluntary response sampling technique to collect data from 348 respondents. It relied on self-completed questionnaires for online data collection through Microsoft Forms, with subsequent processing using SPSS version 28 and AMOS version 29. Data analysis involved the following: frequency distribution to summarise and describe the demographic information, descriptive statistics to summarise and elucidate measures of central tendency and variability of the observed values, EFA to identify underlying factors, CFA to validate factor structure, and SEM to analyse complex relationships among study variables as well as testing all the hypotheses of the study.

The research findings provide evidence that factors that influence the sustainable adoption of e-health tools directly lead to the development and implementation of effective strategies for the sustainable adoption of e-health tools for DMHS. Moreover, in spite of the COVID-19 pandemic being the primary driver of the adoption of e-health tools in SA universities, the study findings demonstrate that their impact on sustainable adoption was limited. The study findings further indicated that as the factors influencing sustainable adoption increased, the current state of adoption also decreased. This suggested that while e-health tools were initially embraced due to the increased awareness and perceived benefits and importance of e-health tools the actual implementation may have been hindered by initial challenges, complexities and related changes during the COVID-19 pandemic. Finally, the study provided empirical evidence that the mere existence of DMHS is not sufficient to ensure sustainable adoption of e-health tools, but rather effective strategies are essential to improve and ensure sustainable adoption of tools for the provision of DMHS.

The main output of this study is the development of a framework for the sustainable adoption of e-health tools in delivering DMHS at the selected university. The proposed framework outlines the key details of how the selected university would achieve sustainable adoption of e-health tools. In conducting this research, the study contributes in five significant ways: practical, empirical, theoretical, methodological and contextual. The study findings hold the potential to significantly advance the achievement of SDG 3 of the UN, which aims to ensure healthy lives and promote well-being for all at all ages.

REFERENCES

Abbott, J.A.M., Klein, B. & Ciechomski, L. 2008. Best practices in online therapy. *Journal of Technology in Human Services*, *26*(2-4), 360-375.

Abelson, J.S., Kaufman, E., Symer, M., Peters, A., Charlson, M. & Yeo, H. 2017. Barriers and benefits to using mobile health technology after operation: A qualitative study. *Surgery*, *162*(3), 605-611.

Adom, D., Hussein, E.K. & Agyem, J.A. 2018. Theoretical and conceptual framework: Mandatory ingredients of a quality research. *International Journal of Scientific Research*, *7*(1), 438-441.

Ahmad, B.I.E. 2014. User acceptance of health information technology (HIT) in developing countries: a conceptual model. *Procedia Technology*, *16*(1), 1287-1296.

Ajunwa I. 2017. Workplace Wellness Programs Could Be Putting Your Health Data at Risk. https://hbr.org/2017/01/workplace-wellness-programs-could-be-putting-your-health-data-at-risk[WebCite%20Cache%20ID%206yOtnt3uj] [Accessed 22 February 2022].

Ajzen, I. 2020. The theory of planned behaviour: Frequently asked questions. *Human Behaviour and Emerging Technologies*, *2*(4), 314-324.

Al Serhan, O. & Houjeir, R. 2020. Academic Capitalism and Faculty Burnout: Evidence from the United Arab Emirates. *Cypriot Journal of Educational Sciences*, *15*(5), 1368-1393.

Alanzi, T., Alsalem, A.A., Alzahrani, H., Almudaymigh, N., Alessa, A., Mulla, R., AlQahtani, L., Bajonaid, R., Alharthi, A., Alnahdi, O. & Alanzi, N. 2023. AI-Powered Mental Health Virtual Assistants' Acceptance: An Empirical Study on Influencing Factors Among Generations X, Y, and Z. *Cureus*, *15* (11).

AlAwadhi, S., AlHabib, N., Murad, D., AlDeei, F., AlHouti, M., Beyrouthy, T., & Dan Al-Kork, S. 2017. Virtual reality application for interactive and informative learning. *Second International Conference on Bio-engineering for Smart Technologies (BioSmart), 1-4.*

Alegría, M., NeMoyer, A., Falgàs Bagué, I., Wang, Y. & Alvarez, K. 2018. Social determinants of mental health: Where we are and where we need to go. *Current Psychiatry Reports*, *20*(11), 1-13.

Aleixo, A.M., Leal, S. & Azeiteiro, U.M. 2018. Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal. *Journal of Cleaner Production*, *172*, 1664-1673.

Aleksynska, M., Berg, J., Foden, D., Johnston, H.E.S., Parent-Thirion, A. & Vanderleyden, J. 2019. *Working conditions in a global perspective*. Geneva: International Labour Organization.

Alimohamadi, Y., Sepandi, M., Taghdir, M. & Hosamirudsari, H. 2020. Determine the most common clinical symptoms in COVID-19 patients: a systematic review and meta-analysis. *Journal of preventive medicine and hygiene*, *61*(3), 304-312.

Allen, I. E. & Seaman, J. 2013. *Changing course: Ten years of tracking online education in the United States*. Newburyport: Sloan Consortium.

Allen, J., Rowan, L. & Singh, P. 2020. Teaching and teacher education in the time of COVID-19. *Asia-Pacific Journal of Teacher Education*, 48(3), 233-236.

Al-Mamary, Y.H., Shamsuddin, A. & Aziati, N. 2014. Factors affecting successful adoption of management information systems in organizations towards enhancing organizational performance. *American Journal of Systems and Software*, *2*(5), 121-126.

Alvi, M.H.2016. *A Manual for Selecting Sampling Techniques in Research*. University of Karachi, Iqra University. https://mpra.ub.uni-muenchen.de/70218/1/MPRA_paper_70218.pdf [Accessed 26 February 2021].

Anderson, I.M., Haddad, P.M. & Scott, J. 2012. Bipolar disorder. *BMJ*, *345*.

Andrews, G., Cuijpers, P., Craske, M.G., McEvoy, P. & Titov, N. 2010. Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. *PloS One*, *5*(10), e13196.

Antwi, S.K. & Hamza, K. 2015. Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European Journal of Business and Management*, *7*(3), 217-225.

Araújo, N.M.F. 2020. Impact of the Fourth Industrial Revolution on the health sector: A qualitative Study. *Healthcare Informatics Research*, *26*(4), 328-334.

Arday, J. 2022. No one can see me cry: Understanding mental health issues for Black and minority ethnic staff in higher education. *Higher Education*, *83*(1), 79-102.

Asi, Y.M. & Williams, C. 2018. The role of digital health in making progress toward Sustainable Development Goal (SDG) 3 in conflict-affected populations. *International Journal of Medical Informatics*, *114*, 114-120.

Aungst, T.D. & Patel, R. 2020. Integrating Digital Health into the Curriculum—Considerations on the Current Landscape and Future Developments. *Journal of Medical Education and Curricular Development*, *7*, 1-7.

Awa, H.O. & Ojiabo, O.U. 2016. A model of adoption determinants of ERP within TOE framework. *Information Technology & People*, *29(4),* 901–930.

Azimoh, C.L., Klintenberg, P., Mbohwa, C. & Wallin, F. 2017. Replicability and scalability of mini-grid solution to rural electrification programs in sub-Saharan Africa. *Renewable Energy*, 106, 222-231.

Babbie, E. & Mouton, J. 2001. *The practice of social research*. 1st ed. Cape Town: Oxford University Press.

Babbie, E. 2014. *The Basics of Social Research*. 6th ed. London: Cengage Learning.

Badat, S. 2009. Theorising institutional change: post-1994 South African higher education. *Studies in Higher Education*, *34*(4), 455-467.

Badat, S. 2010. The Challenges of Transformation in Higher Education and Training Institutions in South Africa. Midrand: Development Bank of Southern Africa.

Badenhorst, M. & Botha, D. 2022. Workplace bullying in a South African higher education institution: Academic and support staff experiences. *SA Journal of Human Resource Management*, *20*(0), 1909.

Baghaei, N., Chitale, V., Hlasnik, A., Stemmet, L., Liang, H.N. & Porter, R. 2021. Virtual reality for supporting the treatment of depression and anxiety: Scoping review. *JMIR Mental Health*, *8*(9), e29681.

Bai, C., Dallasega, P., Orzes, G. & Sarkis, J. 2020. Industry 4.0 technologies assessment: A sustainability perspective. *International Journal of Production Economics*, *229*, 107776.

Baker, J. 2012. The technology-organization-environment framework. In Dwivedi, Y., Wade, M. & Schneberger, S. (Eds). *Information Systems Theory: Explaining and Predicting Our Digital Society. New York.* Springer, 231-246.

Balcombe, L. & De Leo, D. 2021. Digital mental health challenges and the horizon ahead for solutions. *JMIR Mental Health*, *8*(3), e26811.

Bamufleh, D., Alshamari, A.S., Alsobhi, A.S., Ezzi, H.H. & Alruhaili, W.S. 2021. Exploring public attitudes toward e-government health applications used during the COVID-19 pandemic: Evidence from Saudi Arabia. *Computer and Information Science*, *14*(3), 1.

Baniasadi, T., Niakan Kalhori, S.R., Ayyoubzadeh, S.M., Zakerabasali, S. & Pourmohamadkhan, M. 2018. Study of challenges to utilise mobile-based health care monitoring systems: a descriptive literature review. *Journal of Telemedicine and Telecare*, *24*(10), 661-668.

Bansal, P. & DesJardine, M.R. 2014. Business sustainability: It is about time. *Strategic Organization*, 12(1), 70-78.

Bantom, S.A., de la Harpe, R. and Ruxwana, N., 2016, September. Accessibility to patients' own health information: A case in rural Eastern Cape, South Africa. In *Proceedings of the Annual Conference of the South African Institute of Computer Scientists and Information Technologists* (pp. 1-9).

Barak, A., Klein, B. & Proudfoot, J.G. 2009. Defining internet-supported therapeutic interventions. *Annals of Behavioral Medicine*, *38*(1), 4-17.

Barkhuizen, N. & Rothmann, S. 2008. Occupational stress of academic staff in South African higher education institutions. *South African Journal of Psychology*, *38*(2), 321-336.

Barkhuizen, N., Roodt, E. & Schutte, N. 2014. Talent management of academics: balancing job demands and job resources. *Mediterranean Journal of Social Sciences*, *5*(20), 2033.

Barkhuizen, N., Rothmann, S. & Van De Vijver, F.J. 2014. Burnout and work engagement of academics in higher education institutions: Effects of dispositional optimism. *Stress and Health*, *30*(4), 322-332.

Barkway, P. 2006. Creating supportive environments for mental health promotion in the workplace. *Contemporary Nurse*, *21*(1), 131-141.

Bassan, S. 2020. Data privacy considerations for telehealth consumers amid COVID-19. *Journal of Law and the Biosciences*, *7*(1), 1-12.

Bauer, M., Glenn, T., Monteith, S., Bauer, R., Whybrow, P.C. & Geddes, J. 2017. Ethical perspectives on recommending digital technology for patients with mental illness. *International Journal of Bipolar Disorders*, *5*, 1-14.

Bauman S, & Rivers I. 2015. *Mental health in the digital age*. Palgrave Macmillan: New York.

Baumel, A. 2015. Online emotional support delivered by trained volunteers: users' satisfaction and their perception of the service compared to psychotherapy. *Journal of Mental Health*, *24*(5), 313-320.

Bayat, M.S. & Fox, W. 2007. *A guide to managing research*. Cape Town: Juta.

Beard, C., Silverman, A.L., Forgeard, M., Wilmer, M.T., Torous, J. & Björgvinsson, T. 2019. Smartphone, social media, and mental health app use in an acute transdiagnostic psychiatric sample. *JMIR mHealth and uHealth*, *7*(6), e13364.

Beiwinkel, T., Eibing, T., Telle, N.T., Siegmund-Schultze, E. & Roessler, W. 2017. Effectiveness of a web-based intervention in reducing depression and sickness absence: randomized controlled trial. *Journal of Medical Internet Research*, *19*(6), 1-14.

Bell, I.H., Nicholas, J., Alvarez-Jimenez, M., Thompson, A. & Valmaggia, L. 2022. Virtual reality as a clinical tool in mental health research and practice. *Dialogues in Clinical Neuroscience*, 22:2, 169-177.

Berkman, N.D., Davis, T.C. & McCormack, L. 2010. Health literacy: what is it? *Journal of Health Communication*, *15*(S2), 9-19.

Bernecker, S.L., Banschback, K., Santorelli, G.D. & Constantino, M.J. 2017. A web-disseminated self-help and peer support program could fill gaps in mental health care: Lessons from a consumer survey. *Journal of Medical Internet Research Mental Health*, *4*(1), 1-42.

Bezuidenhout, A. & Cilliers, F.V. 2010. Burnout, work engagement and sense of coherence in female academics in higher-education institutions in South Africa. *SA Journal of Industrial Psychology*, *36*(1), 1-10.

Bidargaddi, N., Schrader, G., Klasnja, P., Licinio, J. & Murphy, S. 2020. Designing m-Health interventions for precision mental health support. *Translational Psychiatry*, *10*(1), 222.

Bierbooms, J.J., van Haaren, M., IJsselsteijn, W.A., de Kort, Y.A., Feijt, M. & Bongers, I.M. 2020. Integration of online treatment into the "new normal" in mental health care in post–COVID-19 times: Exploratory qualitative study. *JMIR Formative Research*, *4*(10), 21344.

Biron, C., Brun, J. P., & Ivers, H. 2008. Extent and sources of occupational stress in university staff. *Work: Journal of Prevention, Assessment & Rehabilitation, 30(4)* 511–522.

Blair, J. & Abdullah, S. 2018. Supporting constructive mental health discourse in social media. *Proceedings of the 12th EAI International Conference on Pervasive Computing Technologies for Healthcare*, 299-303.

Blanche, M.T., Durrheim, K. & Painter, D. Eds. 2006. *Research in Practice: Applied Methods for the Social Sciences*. 2nd ed. Cape Town: University of Cape Town Press.

Bless, C., Higson-Smith, C. & Kagee, A. 2006. *Fundamentals of social research methods: an African perspective*. 4th ed. Lusaka: Juta.

Bloom, D., Cafiero, E., Jane-Llopis, E., Abrahams-Gessel, S., Bloom, L. & Fathima, S. 2011. *The Global Economic Burden of Non-Communicable Diseases*. Geneva: World Economic Forum.

Bolton, H., Matsau, L. & Blom, R. 2020. Flexible learning pathways: The national qualifications framework backbone. *Report for the IIEP-UNESCO Research 'SDG4: Planning for Flexible Learning Pathways in Higher Education*. https://www.saqa.org.za/sites/default/files/2020-12/Flexible-Learning-Pathways-in-SA-2020-12.pdf [Accessed 25 March 2022].

Bordens, K.S. & Abbott, B.B. 2011. *Research Design and Methods: A Process Approach.* 8th Ed. Boston: McGraw Hill.

Borghouts, J., Eikey, E., Mark, G., De Leon, C., Schueller, S.M., Schneider, M., Stadnick, N., Zheng, K., Mukamel, D. & Sorkin, D.H. 2021. Barriers to and facilitators of user engagement with digital mental health interventions: systematic review. *Journal of Medical Internet Research*, *23*(3) .e24387.

Bouzikos, S., Afsharian, A., Dollard, M. & Brecht, O. 2022. Contextualising the Effectiveness of an Employee Assistance Program Intervention on Psychological Health: The Role of Corporate Climate. *International Journal of Environmental Research and Public Health*, *19*(9), 5067.

Bozalek, V., Ng'ambi, D. & Gachago, D. 2013. Transforming teaching with emerging technologies: Implications for higher education institutions. *South African Journal of Higher Education*, *27*(2), 419-436.

Brenes, G.A., Ingram, C.W. & Danhauer, S.C. 2011. Benefits and challenges of conducting psychotherapy by telephone. *Professional Psychology: Research and Practice*, *42*(6), 543.

Bruwer, B., Sorsdahl, K., Harrison, J., Stein, D.J., Williams, D. & Seedat, S. 2011. Barriers to mental health care and predictors of treatment dropout in the South African Stress and Health Study. *Psychiatric Services*, *62*(7), 774-781.

Bryman, A & Bell, E. (Eds). 2011. *Research Methodology: Business and Management contexts*. Cape Town: Oxford University Press.

Brynard, P.A. & Hanekom, S.X. 2006. *Introduction to Research in Management–Related Fields.* Pretoria: Van Schaik publishers.

Burdisso, S.G., Errecalde, M. & Montes-y-Gómez, M. 2019. A text classification framework for simple and effective early depression detection over social media streams. *Expert Systems with Applications*, *133*, 182-197.

Burns, J.M., Davenport, T.A., Durkin, L.A., Luscombe, G.M. & Hickie, I.B. 2010. The internet as a setting for mental health service utilisation by young people. *Medical Journal of Australia*, *192*, 22-26.

Burns, R.B & Burns, R.A. 2008. *Business Research Methods and Statistics using SPSS*. London: Sage.

Catano, V., Francis, L., Haines, T., Kirpalani, H., Shannon, H., Stringer, B., & Lozanzki, L. 2010. Occupational stress in Canadian universities: A national survey. *International Journal of Stress Management, 17(3),* 232–258.

Cebrián, G., Grace, M. & Humphris, D. 2015. Academic staff engagement in education for sustainable development. *Journal of Cleaner Production*, *106*, 79-86.

Chabaya, R.A. 2015. *Academic staff development in higher education institutions: a case study of Zimbabwe state universities.* Unpublished doctoral dissertation. University of South Africa.

Chambers, D.A., Glasgow, R.E. & Stange, K.C. 2013. The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implementation Science*, *8*(1), 1-11.

Chasi, S. & Quinlan, O. 2021. Inclusion in Times of Covid-19: The Case of International Students in South Africa. *Journal of Student Affairs in Africa*, *9*(1), 205-221.

Chasi, S. 2021. South Africa's Policy Framework for Higher Education Internationalisation: A Decolonial Perspective. *The Thinker*, *89*(4), 30-37.

CHE. 2018. *VitalStats: Public Higher Education 2016*. Pretoria: Council for Higher Education.

Chen, C.Y.C. 2022. Grieving during the COVID-19 pandemic: In-person and virtual "goodbye". *OMEGA-Journal of Death and Dying*, 0(0) 1–17.

Chigona, W., Mavela, P., Mulaji, S., Mutetwa, S., Moyanga, R. & Ndoro, H. 2021. Critical Discourse Analysis on Media Coverage of COVID-19 Contract Tracing Applications: Case of South Africa. *Proceedings of the 10th International Conference on Communities & Technologies-Wicked Problems in the Age of Tech*, 15-24.

Chilisa, B. & Kawulich, B. 2012. *Selecting a research approach: paradigm, methodology and methods.* In: Doing social research: a global context. London, New York: McGraw-Hill Higher Education.

Choto, P. 2019. *Marketing and management framework to create sustainable healthcare sector non-profit organisations in South Africa.* Unpublished Doctoral thesis. Cape Peninsula University of Technology.

Christine, O. 2011. The effect of global economic crisis on service delivery in selected non-governmental organizations in Kenya. *Journal of Management and Strategy*, *2*(4), 101-117.

Clough, B.A., Rowland, D.P. & Casey, L.M. 2019. Development of the eTAP-T: A measure of mental health professionals' attitudes and process towards e-interventions. *Internet Interventions*, *18*, 100288.

Connellan, N. 2021. Link between mental health and physical health. In Ratangee, N. (ed). *Improving Mental Health in the Workplace*. Cape Town: Knowledge Publishing.

Cooper, D. R. & Schindler, P.S. 2011. *Business Research Methods*. 11th ed. New York: McGraw-Hill

Cooper, S., van Rooyen, H. & Wiysonge, C.S. 2021. COVID-19 vaccine hesitancy in South Africa: how can we maximize uptake of COVID-19 vaccines? *Expert Review of Vaccines*, *20*(8), 921-933.

Cowpertwait, L. & Clarke, D. 2013. Effectiveness of web-based psychological interventions for depression: a meta-analysis. *International Journal of Mental Health and Addiction*, *11*(2), 247-268.

Craske, M.G., Rauch, S.L., Ursano, R., Prenoveau, J., Pine, D.S. & Zinbarg, R.E. 2011. What is an anxiety disorder? *Focus*, *9*(3), 369-388.

Creswell, J. W., Vicki, L. P. C., Michelle, L. G. & William, E. L. 2003. Advanced mixed methods research designs. In *Methodological and Analytical Issues,* 209‑240.

Crowther, D. & Lancaster, G. 2009. *Research methods: A concise Introduction to Research in Management and Business Consultancy*. 2nd ed. Oxford: Elsevier.

Cunningham, S., Hudson, C.C. & Harkness, K. 2021. Social media and depression symptoms: a meta-analysis. *Research on Child and Adolescent Psychopathology*, *49,* 241-253.

D'Alfonso, S. 2020. AI in mental health. *Current Opinion in Psychology*, *36*, 112-117.

D'Hotman, D. & Loh, E. 2020. AI enabled suicide prediction tools: a qualitative narrative review. *BMJ health & care informatics*, *27*(3).

Dang, L.M., Piran, M.J., Han, D., Min, K. & Moon, H. 2019. A survey on internet of things and cloud computing for healthcare. *Electronics*, *8*(7), 768.

Dash, G. & Paul, J. 2021. CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. *Technological Forecasting and Social Change*, *173*, 121092.

Davis, F.D. 1989. Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly* 13(2), 319–340.

De Vos, A. S., Strydom, H., Fouché, C. B. & Delport, C. S. L. 2011. *Research at grass roots for the social sciences and human service professionals.* 4th ed. Pretoria, South Africa: Van Schaik Publishers.

de Wit, H. & Altbach, P.G. 2021. Internationalization in higher education: global trends and recommendations for its future. *Policy Reviews in Higher Education*, *5*(1), 28-46.

Denscombe, M. 2011. *Ground rules for social research: Guidelines for good practice.* 2nd ed. McGraw-Hill: New York.

Department of Co-operative Governance and Traditional Affairs. 2020. *Declaration of national state of disaster*. https://www.gov.za/sites/default/files/gcis_document/202003/43096gon313.pdf [Accessed 24 February 2023].

Department of Health. 2020. *Minister Zweli Mkhize reports first case of coronavirus Covid-19*. Retrieved from https://www.gov.za/speeches/health-reports-first-case-covid-19-coronavirus-5-mar-2020-0000 [Accessed 24 February 2023].

Department of Higher Education and Training. 2021. Annual performance plan 2021/2022. Pretoria.

DeVellis, R.F. 2017. *Scale development: Theory and applications.* 4th ed. Thousand Oaks, CA: Sage.

Dhanpat, N., Geldenhuys, M. & De Braine, R. 2019. Preliminary development of the Higher Education Hindrance Demands Scale amongst academics in the South African context. *SA Journal of Industrial Psychology*, *45*(1), 1-12.

Dhawan, S. 2020. Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5-22.

Di Carlo, F., Sociali, A., Picutti, E., Pettorruso, M., Vellante, F., Verrastro, V., Martinotti, G. and di Giannantonio, M. 2021. Telepsychiatry and other cutting-edge technologies in COVID-19 pandemic: Bridging the distance in mental health assistance. *International Journal of Clinical Practice*, *75*(1).

Du Plessis, M. 2017. Health, safety and wellness. In Nel, P & Werner, A. (eds). *Human resource management*. 10th ed. Cape Town: Oxford University Press.

Du Plessis, M. 2020. Model of coping with occupational stress of academics in a South African higher education institution. *SA Journal of Industrial Psychology*, *46*(1), 1-11.

Du Plessis, M., Jansen van Vuuren, C.D., Simons, A., Frantz, J., Roman, N. & Andipatin, M. 2022. South African Higher Education Institutions at the Beginning of the Covid-19 Pandemic: Sense-Making and Lessons Learnt. *Frontiers in Education*, 6, 740016.

Du Plooy, G.M. 2009. *Communication Research: Techniques, Methods and Applications.* Cape Town: Juta.

Du Preez, P., Verhoef, A.H. & Simmonds, S. 2016. Rethinking and researching transformation in higher education: A meta-study of South African trends. *Transformation in Higher Education*, *1*(1), 1-7.

Duffett, R.G. 2015. *Social media as a marketing communication channel amongst Generation Y: a new paradigm for hierarchy response models*. Unpublished doctoral dissertation. Cape Peninsula University of Technology.

Dzvimbo, K.P. & Moloi, K.C. 2013. Globalisation and the internationalisation of higher education in sub-Saharan Africa. *South African Journal of Education*, *33*(3), 1-16.

Edlin, G. & Golanty, E. 2014. *Health and wellness*. 14th Ed. Jones and Bartlett Publishers: Burgin, KY, U.S.A.

Edwards, J.L. & Crisp, D.A. 2017. Seeking help for psychological distress: barriers for mental health professionals. *Australian Journal of Psychology*, *69*(3), 218-225.

El-Gohary, H. 2012. Factors affecting E-Marketing adoption and implementation in tourism firms: An empirical investigation of Egyptian small tourism organisations. *Tourism Management*, *33*(5), 1256-1269.

Ellis, L.A., Meulenbroeks, I., Churruca, K., Pomare, C., Hatem, S., Harrison, R., Zurynski, Y. & Braithwaite, J. 2021. The application of e-mental health in response to COVID-19: scoping review and bibliometric analysis. *JMIR Mental Health*, *8*(12), e32948.

Engel, G.L. 1977. The need for a new medical model: a challenge for biomedicine. *Science*, *196*(4286), 129-136.

Evermann, J. & Tate, M. 2016. Assessing the predictive performance of structural equation model estimators. *Journal of Business Research*, *69*(10), 4565-4582.

Eysenbach, G. 2001. What is e-health? *Journal of medical Internet Research*, *3*(2), e20.

Fagherazzi, G., Goetzinger, C., Rashid, M.A., Aguayo, G.A. & Huiart, L. 2020. Digital Health Strategies to Fight COVID-19 Worldwide: Challenges, Recommendations, and a Call for Papers. *Journal of Medical Internet Research*, *22*(6), 1-10.

Fairburn, C.G. & Patel, V. 2017. The impact of digital technology on psychological treatments and their dissemination. *Behaviour Research and Therapy*, *88*(1), 19-25.

Fanta, G.B. & Pretorius, L. 2018. A conceptual framework for sustainable eHealth implementation in resource-constrained settings. *South African Journal of Industrial Engineering*, *29*(3),132-147.

Farooq, R. 2016. Role of structural equation modeling in scale development. *Journal of Advances in Management Research*, *13*(1), 75–91.

Fishbein, M. & Ajzen, I. 1975. *Belief, attitude, intention and behaviour: An Introduction to theory and research*. Addison-Wesley, Reading, MA.

Fonseca, A., Gorayeb, R. & Canavarro, M.C. 2016. Women's use of online resources and acceptance of e-mental health tools during the perinatal period. *International Journal of Medical Informatics*, *94*, 228-236.

Ford, M. 2017. The functions of higher education. *American Journal of Economics and Sociology*, *76*(3), 559-578.

Fornell, C. & Larcker, D.F. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.

Forte, G., Favieri, F., Tambelli, R. & Casagrande, M. 2020. COVID-19 pandemic in the Italian population: validation of a post-traumatic stress disorder questionnaire and prevalence of PTSD symptomatology. *International Journal of Environmental Research and public Health*, *17*(11), 4151.

Frye, N.E. & Dornisch, M.M. 2010. When is trust not enough? The role of perceived privacy of communication tools in comfort with self-disclosure. *Computers in Human Behavior*, *26*(5), 1120-1127.

Furusa, S.S. & Coleman, A. 2018. Factors influencing e-health implementation by medical doctors in public hospitals in Zimbabwe. *South African Journal of Information Management*, *20*(1), 1-9.

Fynn, A. & van der Walt, H.D. 2023. Examining staff burnout during the transition to teaching online due to COVID-19 implications. *SA Journal of Human Resource Management*, *21*, 2062.

Gainsbury, S. & Blaszczynski, A. 2011. A systematic review of Internet-based therapy for the treatment of addictions. *Clinical Psychology Review*, *31*(3), 490-498.

Garrido, S., Millington, C., Cheers, D., Boydell, K., Schubert, E., Meade, T. & Nguyen, Q.V. 2019. What works and what doesn't work? A systematic review of digital mental health interventions for depression and anxiety in young people. *Frontiers in Psychiatry*, *10*, 759.

Gbollie, E.F., Bantjes, J., Jarvis, L., Swandevelder, S., Du Plessis, J., Shadwell, R., Davids, C., Gerber, R., Holland, N. & Hunt, X. 2023. Intention to use digital mental health solutions: A cross-sectional survey of university students attitudes and perceptions toward online therapy, mental health apps, and chatbots. *Digital Health*, *9*, 1-19.

George, G., Strauss, M., Lansdell, E., Nadesan-Reddy, N., Moroe, N., Reddy, T., Eshun-Wilsonova, I. & Moshabela, M. 2022. South African University Staff and Students' Perspectives, Preferences, and Drivers of Hesitancy Regarding COVID-19 Vaccines: A Multi-Methods Study. *Vaccines*, *10*(8), 1250.

Gidigbi, M.O. 2021. Digital Technologies for Sustainable Development: Dual Challenge of Sustainability and Inclusivity Perspective. *Law & Digital Technologies*, (1), 27-36.

Gie, L. 2017. *Theoretical and practical perspectives of employee wellness programmes at a selected South African university.* Unpublished doctoral dissertation. Cape Peninsula University of Technology.

Gie, L., Slabbert, A. & Haydam, N. 2017. Balancing the double-edged sword of technology within a modern university workplace. *Problems and Perspectives in Management*, 15(3), 425-437.

Gilbert, P. 2007. *Psychotherapy and Counselling for Depression*. 3rd ed. London: Sage Publication.

Gillwald, A., Mothobi, O. & Rademan, B. 2018. The state of ICT in South Africa. Policy Paper no. 5, Series 5: After Access State of ICT in South Africa. Retrieved from https://www.africaportal.org/publications/state-ict-south-africa/ [Accessed 19 February 2022].

Giumetti, G.W. & Kowalski, R.M. 2022. Cyberbullying via social media and well-being. *Current Opinion in Psychology*, 101314.

Global System for Mobile Communications Association. 2023. The Mobile Economy Sub-Saharan Africa 2023. https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/sub-saharan-africa/ [Accessed 10 June 2024].

Gomes de Melo e Castro e Melo, J.A., Araújo, N.M.F. 2020. Impact of the fourth industrial revolution on the health sector: a qualitative study. *Healthcare informatics research*, *26*(4), 328-334.

Gooding, P. 2019. Mapping the rise of digital mental health technologies: Emerging issues for law and society. *International Journal of Law and Psychiatry*, *67*, 1-11.

Goolnik, G. 2012. Change Management Strategies When Undertaking eLearning Initiatives in Higher Education. *Journal of Organizational Learning & Leadership*, *10*(2).9-21.

Gorla, N., Somers, T.M. & Wong, B. 2010. Organizational impact of system quality, information quality, and service quality. *The Journal of Strategic Information Systems*, *19*(3), 207-228.

Govender, V. 2021. Are we equipped to deal with this? What role does the workplace play in managing mental health? In Ratanga, N. (ed). *Improving mental health in the workplace*. Randburg: Knowledge Resource Publishing.

Graham, A.K., Lattie, E.G., Powell, B.J., Lyon, A.R., Smith, J.D., Schueller, S.M., Stadnick, N.A., Brown, C.H. & Mohr, D.C. 2020. Implementation strategies for digital mental health interventions in health care settings. *American Psychologist*, *75*(8), 1080-1092.

Grande, I., Berk, M., Birmaher, B. & Vieta, E. 2016. Bipolar disorder. *The Lancet*, *387*(10027), 1561-1572.

Grange, L.L., Du Preez, P., Ramrathan, L. & Blignaut, S. 2020. Decolonising the university curriculum or decolonial-washing? A multiple case study. *Journal of Education (University of KwaZulu-Natal)*, (80), 25-48.

Graveling, R.A., Crawford J.O., Cowie, H, Amati, C, Vohra, S. 2008. *A review of workplace interventions that promote mental wellbeing in the workplace*. Edinburgh: Institute of Occupational Medicine.

Grinnell, R.M. & Unrau, Y.A. 2005. *Social work research and evaluation: Quantitative and qualitative approaches*. 7th ed. New York: Oxford University Press.

Grobbelaar, S.S. & Uriona-Maldonado, M. 2019. Using technology to improve access to healthcare: The case of the MomConnect programme in South Africa. *Local Economy*, *34*(8), 838-852.

Grzybowski, L. 2022. *Disruptive Technologies in South Africa and Sub-Saharan Africa: The Case of Mobile Telecommunications Services*. Working Paper DT-005, African Economic Research Consortium.

Guendelman, S., Broderick, A., Mlo, H., Gemmill, A. & Lindeman, D. 2017. Listening to communities: mixed-method study of the engagement of disadvantaged mothers and pregnant women with digital health technologies. *Journal of medical Internet research*, *19*(7), e7736.

Guerriero, C., Haines, A. & Pagano, M., 2020. Health and sustainability in post-pandemic economic policies. *Nature Sustainability*, *3*(7), 494-496.

Gupta, S. 2013. For mobile devices, think Apps, not ads. *Harvard Business Review,* 91, 70–75.

Guthrie, S., Lichten, C., Van Belle, J., Ball, S., Knack, A. & Hofman, J. 2017. *Understanding mental health in the research environment. A rapid evidence assessment*. Santa Mónica, CA: Rand Corporation.

Gwaka, L.T. 2015. *Social media risks in large and medium enterprises in the cape metropole: the role of internal auditors*. Unpublished masters' dissertation. Cape Peninsula University of Technology.

Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. 2014. *Multivariate data analysis*. 7th Ed. Essex: Pearson Education Limited.

Hair, J.F., Ortinau, D.J. & Harrison, D.E. 2021. *Essentials of marketing research.* McGraw-Hill, New York, NY.

Hair, Jr. J.F., Black, W.C., Babin, B.J. & Anderson, R.E. 2019. *Multivariate data analysis*. 8th Ed. Cengage, Hampshire.

Hall, R., Hall, R., & Chapman, M. 2008. The 1995 Kikwit Ebola outbreak: Lessons hospitals and physicians can apply to future viral epidemics. *General Hospital Psychiatry, 30*(5), 446–452.

Han, L., Liu, J., Evans, R., Song, Y. & Ma, J. 2020. Factors Influencing the Adoption of Health Information Standards in Health Care Organizations: A Systematic Review Based on Best Fit Framework Synthesis. *JMIR Medical Informatics*, *8*(5), 1-14.

Hanisch, S.E., Twomey, C.D., Szeto, A.C., Birner, U.W., Nowak, D. & Sabariego, C. 2016. The effectiveness of interventions targeting the stigma of mental illness at the workplace: a systematic review. *BMC psychiatry*, *16*(1), 1-11.

Harn, D.B, Payne, W.A, & Lucas, E.B. 2009. Focus on Health. 10th Ed. McGraw-Hill Higher Education: Avenel, New Jersey, U.S.A

Hassounah, M., Raheel, H. & Alhefzi, M. 2020. Digital response during the COVID-19 pandemic in Saudi Arabia. *Journal of Medical Internet Research*, *22*(9), e19338.

Hay, L., Duffy, A. & Whitfield, R.I. 2014. The sustainability cycle and loop: models for a more unified understanding of sustainability. *Journal of Environmental Management*, *133*, 232-257.

Haydam, N. E. & Mostert, T. 2013. *Marketing Research for Managers*. Cape Town: Publisher.

Heale, R. & Noble, H. 2019. Integration of a theoretical framework into your research study. *Evidence-based Nursing*, *22*(2), 36-37.

Hedding, D.W., Greve, M., Breetzke, G.D., Nel, W. & Van Vuuren, B.J. 2020. COVID-19 and the academe in South Africa: Not business as usual. *South African Journal of Science*, *116*(7-8),1-3.

Heddle, N.M. & Ness, P.M. 2009. Reviewing manuscripts: tips and responsibilities. *Transfusion*, *49*(11), 2265-2268.

Heene, M., Hilbert, S., Draxler, C., Ziegler, M. & Bühner, M. 2011. Masking misfit in confirmatory factor analysis by increasing unique variances: a cautionary note on the usefulness of cutoff values of fit indices. *Psychological Methods*, *16*(3), 319-336

Heleta, S. 2016. Decolonisation of higher education: Dismantling epistemic violence and Eurocentrism in South Africa. *Transformation in Higher Education*, *1*(1), 1-8.

Heleta, S. 2022. Critical Review of the Policy Framework for Internationalisation of Higher Education in South Africa. *Journal of Studies in International Education*, 0(0).

Hénard, F., Diamond, L. & Roseveare, D. 2012. *Approaches to internationalisation and their implications for strategic management and institutional practice*. Paris: OECD.

Higher Education South Africa. 2011. *A generation of growth: Proposal for a national programme to develop the next generation of academics for South African Higher Education*. Pretoria: University of South Africa.

Higher Education South Africa. 2014. *South African Higher Education in the 20th Year of Democracy: Context, Achievements and Key Challenges*. Pretoria: HESA.

Hill, A., MacNamara, Á., Collins, D. & Rodgers, S. 2016. Examining the role of mental health and clinical issues within talent development. *Frontiers in Psychology*, *6*, 2042.

Hiran, K.K. & Henten, A. 2020. An integrated TOE–DoI framework for cloud computing adoption in the higher education sector: case study of Sub-Saharan Africa, Ethiopia. *International Journal of System Assurance Engineering and Management*, 11(2), 441 – 449.

Holst, C., Sukums, F., Radovanovic, D., Ngowi, B., Noll, J. & Winkler, A.S. 2020. Sub-Saharan Africa—the new breeding ground for global digital health. *The Lancet Digital Health*, *2*(4), 160-162.

Houston, D., Meyer, L. H., & Paweai, E. A. 2006. Academic staff workloads and job satisfaction: Expectations and values in academe. *Journal of Higher Education Policy and Management*, 28(1), 17–30.

Howarth, A., Quesada, J., Silva, J., Judycki, S. & Mills, P.R. 2018. The impact of digital health interventions on health-related outcomes in the workplace: a systematic review. *Digital Health*, *4*, 1-8.

Hsu, C.L. & Lin, J.C.C. 2015. What drives purchase intention for paid mobile apps?–An expectation confirmation model with perceived value. *Electronic Commerce Research and Applications*, *14*(1), 46-57.

Hyytinen, H., Laakso, S., Pietikäinen, J., Ratvio, R., Ruippo, L., Tuononen, T. & Vainio, A. 2023. Perceived interest in learning sustainability competencies among higher education students. *International Journal of Sustainability in Higher Education*, *24*(9), 118-137.

Inchausti, F., MacBeth, A., Hasson-Ohayon, I. & Dimaggio, G. 2020. Psychological intervention and COVID-19: what we know so far and what we can do. *Journal of Contemporary Psychotherapy*, 50, 1-8.

Jabareen, Y. 2009. Building a conceptual framework: philosophy, definitions, and procedure. *International Journal of Qualitative Methods*, *8*(4),49-62.

Jacob, C., Sezgin, E., Sanchez-Vazquez, A. & Ivory, C. 2022. Sociotechnical factors affecting patients' adoption of mobile health tools: systematic literature review and narrative synthesis. *JMIR mHealth and uHealth*, *10*(5), e36284.

Jacob, O.N., Jegede, D. & Musa, A. 2021. Problems Facing Academic Staff of Nigerian Universities and the Way Forward. *International Journal on Integrated Education*, 4(1), 230-241.

James, J. & Versteeg, M. 2007. Mobile phones in Africa: how much do we really know? *Social Indicators Research*, *84*, 117-126.

Jasson, F.L. 2020. *Understanding the wellness needs of academic employees at a higher education institution in the Western Cape*. Unpublished master's thesis. University of the Western Cape.

Jere, J.N. & Ngidi, N. 2020. A technology, organisation and environment framework analysis of information and communication technology adoption by small and medium enterprises in Pietermaritzburg. *South African Journal of Information Management*, *22*(1), 1-9.

Johnson, R.D. & Diman, K. 2017. An Investigation of the Factors Driving the Adoption of Cloud-Based Human Resource Information Systems by Small- and Medium-Sized Businesses. In Bondarouk, T., Ruël, H.J.M. & Parry, E. (Eds). Electronic HRM in the Smart Era (The Changing Context of Managing People). Emerald Publishing Limited, 1-31.

Jokonya, O., Kroeze, J.H. & van der Poll, J.A. 2012. October. Towards a framework for decision making regarding IT adoption. In *Proceedings of the South African Institute for Computer Scientists and Information Technologists Conference, 316*-325.

Jones, T., Stroetmann, K., Dobrev, A. & Stroetmann, V. 2011. eHealth for African countries-sustainable strategies. In *Proceedings of the IST-Africa Conference,* 1-11. Gaborone, Botswana, 11-13 May 2011.

Kaboub, F. 2008. Positivist paradigm. In Leong, F. (ed). *Encyclopedia of counselling*. Thousand Oaks, CA: SAGE Publications.

Kagee, A., Remien, R.H., Berkman, A., Hoffman, S., Campos, L. & Swartz, L. 2011. Structural barriers to ART adherence in Southern Africa: challenges and potential ways forward. *Global Public Health*, *6*(1), 83-97.

Kakuma, R., Kleintjes, S., Lund, C., Drew, N., Green, A. & Flisher, A.J. 2010. Mental Health Stigma: What is being done to raise awareness and reduce stigma in South Africa? *African Journal of Psychiatry,* 13(2), 116-124.

Kamulegeya, L.H., Bwanika, J.M., Musinguzi, D. & Bakibinga, P. 2020. Continuity of health service delivery during the COVID-19 pandemic: the role of digital health technologies in Uganda. *The Pan African Medical Journal*, *35, (2), 1-3.*

Kane, H., Baumgart, J.G., El-Hage, W., Deloyer, J., Maes, C., Lebas, M.C., Marazziti, D., Thome, J., Fond-Harmant, L. & Denis, F. 2022. Opportunities and Challenges for Professionals in Psychiatry and Mental Health Care Using Digital Technologies During the COVID-19 Pandemic: Systematic Review. *JMIR Human Factors*, *9*(1), e30359.

Karnoe, A. & Kayser, L. 2015. How is eHealth literacy measured and what do the measurements tell us? A systematic review. *Knowledge Management & E-Learning*, *7*(4), 576.

Kawadler, J.M., Hemmings, N.R., Ponzo, S., Morelli, D., Bird, G. & Plans, D. 2020. Effectiveness of a Smartphone App (BioBase) for Reducing Anxiety and Increasing Mental Well-Being: Pilot Feasibility and Acceptability Study. *Journal of medical Internet Research Formative Research*, *4*(11), 1-11.

Kelly, B.D. 2003. Globalisation and psychiatry. *Advances in Psychiatric Treatment*, *9*(6), 464-470.

Kelly, J.T., Campbell, K.L., Gong, E. & Scuffham, P. 2020. The Internet of Things: Impact and implications for health care delivery. *Journal of medical Internet research*, *22*(11), e20135.

Kerlinger, F. N. & Lee, H. B. 2000. *Foundations of Behavioural Research*. 4th Ed. Belmont, CA: Cengage Learning.

Kerr, P. 2021. Are we in a parallel pipeline? Bringing the casualisation of academic work onto the South African higher education agenda. *Transformation: Critical Perspectives on Southern Africa*, *105*(1), 26-51.

Kessi, S. & Cornell, J. 2015. Coming to UCT: Black students, transformation and discourses of race. *Journal of Student Affairs in Africa*, *3*(2), 1-16.

Khoja, S., Durrani, H., Scott, R.E., Sajwani, A. & Piryani, U. 2013. Conceptual framework for development of comprehensive e-health evaluation tool. *Telemedicine and e-Health*, 19(1) 48-53.

Khoza, H.H., Khoza, S.A. & Mukonza, R.M. 2021. The Impact of Covid-19 in Higher Learning Institutions in South Africa: Teaching and Learning under Lockdown Restrictions. *Journal of African Education*, *2*(3), 107–131.

Kinman, G. & Johnson, S. 2019. Special section on well-being in academic employees. *International Journal of Stress Management*, *26*(2), 159-161.

Kinman, G. 2014. Doing more with less? Work and wellbeing in academics. *Somatechnics*, *4*(2), 219-235.

Kivunja, C. 2018. Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field. *International Journal of Higher Education*, *7*(6), 44-53.

Kleovoulou, J. Burning the candle on both ends: Dealing with burnout. In Ratanga, N. (ed). *Improving Mental Health in the Workplace*. Randburg: Knowledge Resource Publishing.

Knight, H., Carlisle, S., O'connor, M., Briggs, L., Fothergill, L., Al-Oraibi, A., Yildirim, M., Morling, J.R., Corner, J., Ball, J. & Denning, C. 2021. Impacts of the COVID-19 pandemic and Self-Isolation on students and staff in higher education: A qualitative study. *International journal of environmental research and public health*, *18*(20), 10675.

Kohrt, B.A., Hruschka, D.J., Worthman, C.M., Kunz, R.D., Baldwin, J.L., Upadhaya, N., Acharya, N.R., Koirala, S., Thapa, S.B., Tol, W.A. & Jordans, M.J. 2012. Political violence and mental health in Nepal: prospective study. *The British Journal of Psychiatry*, *201*(4), 268-275.

Kontos, E., Blake, K.D., Chou, W.Y.S. and Prestin, A., 2014. Predictors of eHealth usage: insights on the digital divide from the Health Information National Trends Survey 2012. *Journal of medical Internet research*, *16*(7), e172.

Korda, H. & Itani, Z. 2013. Harnessing social media for health promotion and behavior change. *Health Promotion Practice*, *14*(1), 15-23.

Kowatsch, T., Otto, L., Harperink, S., Cotti, A. & Schlieter, H. 2019. A design and evaluation framework for digital health interventions. *IT-Information Technology*, *61*(5-6), 253-263.

Kritz, M. M. 2006. *Globalisation and Internationalisation of Tertiary Education*. New York: United Nations Population Division.

Kruzan, K.P., Fitzsimmons-Craft, E.E., Dobias, M., Schleider, J.L. & Pratap, A. 2022. Developing, Deploying, and Evaluating Digital Mental Health Interventions in Spaces of Online Help-and Information-Seeking. *Procedia Computer Science*, *206*, 6-22.

Kuhlman, T. & Farrington, J. 2010. What is sustainability? *Sustainability*, 2(11), 3436-3448.

Kumar, C.M.S., Singh, S., Gupta, M.K., Nimdeo, Y.M., Raushan, R., Deorankar, A.V., Kumar, T.A., Rout, P.K., Chanotiya, C.S., Pakhale, V.D. & Nannaware, A.D. 2023. Solar energy: A promising renewable source for meeting energy demand in Indian agriculture applications. *Sustainable Energy Technologies and Assessments*, *55*, 102905.

Kuo, M.H. 2011. Opportunities and challenges of cloud computing to improve health care services. *Journal of medical Internet research*, *13*(3), e1867.

Kyalimpa, P. 2013. *Leadership Competence and Sustainable Funding of Local Non-Governmental Organisations in Uganda.* Unpublished doctoral thesis. Mbarara University of Science and Technology.

Labrague, L.J. 2021. Psychological resilience, coping behaviours and social support among health care workers during the COVID-19 pandemic: A systematic review of quantitative studies. *Journal of Nursing Management*, *29*(7), 1893-1905.

Laher, A.E., Van Aardt, B.J., Craythorne, A.D., Van Welie, M., Malinga, D.M. & Madi, S. 2019. 'Getting out of the dark': Implications of load shedding on healthcare in South Africa and strategies to enhance preparedness. *South African Medical Journal*, *109*(12), 899-901.

Laher, S., Bain, K., Bemath, N., de Andrade, V. & Hassem, T. 2021. Undergraduate psychology student experiences during COVID-19: challenges encountered and lessons learnt. *South African Journal of Psychology*, *51*(2), 215-228.

Lal, S. 2019. E-mental health: promising advancements in policy, research, and practice. *Healthcare Management Fórum*, *32*(2), 56-62.

Lamers, S.M., Westerhof, G.J., Bohlmeijer, E.T., ten Klooster, P.M. & Keyes, C.L. 2011. Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of Clinical Psychology*, *67*(1), 99-110.

Lange, L. 2012. The public purposes of the university: a historical view, 1995-2010. In Leibowitz, B. (ed). *Higher education for the public good: views from the south.* Stellenbosch Trentham Books in association with Sun Media: 45–57.

Lawlor, A. & Kirakowski, J. 2014. Online support groups for mental health: a space for challenging self-stigma or a means of social avoidance? *Computers in Human Behavior*, *32*, 152-161.

Lazuras, L. & Dokou, A. 2016. Mental health professionals' acceptance of online counseling. *Technology in Society*, *44*, 10-14.

Lefever, S., Dal, M. & Matthíasdóttir, Á. 2007. Online data collection in academic research: advantages and limitations. *British Journal of Educational Technology*, *38*(4), 574-582.

Lehtimaki, S., Martic, J., Wahl, B., Foster, K.T. & Schwalbe, N. 2021. Evidence on digital mental health interventions for adolescents and young people: systematic overview. *JMIR Mental Health*, *8*(4) e25847.

Leon, N., Schneider, H. & Daviaud, E. 2012. Applying a framework for assessing the health system challenges to scaling up mHealth in South Africa. *BMC medical informatics and decision making*, *12*(1), 1-12.

LeRouge, C., Van Slyke, C., Seale, D. and Wright, K. 2014. Baby boomers' adoption of consumer health technologies: survey on readiness and barriers. *Journal of medical Internet research*, *16*(9), e200.

Letsekha, T. 2013. Revisiting the debate on the Africanisation of higher education: An appeal for a conceptual shift. *The Independent Journal of Teaching and Learning*, *8*(1), 5-18.

Leung, L. 2014. Predicting Internet risks: a longitudinal panel study of gratifications-sought, Internet addiction symptoms, and social media use among children and adolescents. *Health Psychology and Behavioral Medicine: An Open Access Journal*, *2*(1), 424-439.

Lewis, T., Synowiec, C., Lagomarsino, G. & Schweitzer, J. 2012. E-health in low-and middle-income countries: findings from the Center for Health Market Innovations. *Bulletin of the World Health Organization*, *90*, 332-340.

Liang, Y., Qi, G., Wei, K. & Chen, J. 2017. Exploring the determinant and influence mechanism of e-Government cloud adoption in government agencies in China. *Government Information Quarterly*, *34*(3), 481-495.

Liddon, L., Kingerlee, R. & Barry, J.A. 2018. Gender differences in preferences for psychological treatment, coping strategies, and triggers to help-seeking. *British Journal of Clinical Psychology*, *57*(1), 42-58.

Lipschitz, J.M., Connolly, S.L., Van Boxtel, R., Potter, J.R., Nixon, N. & Bidargaddi, N. 2022. Provider perspectives on telemental health implementation: Lessons learned during the COVID-19 pandemic and paths forward. *Psychological Services*.

Liu, D., Feng, X.L., Ahmed, F., Shahid, M. & Guo, J. 2022. Detecting and measuring depression on social media using a machine learning approach: systematic review. *JMIR Mental Health*, *9*(3), e27244.

Lotkowski, V.A., Robbins, S.B. & Noeth, R.J. 2004. The Role of Academic and Non-Academic Factors in Improving College Retention. ACT Policy Report. *American College Testing ACT Inc*.

Lund, C. Petersen, I., Kleintjes, S. & Bhana, A. 2012. Mental health services in South Africa: Taking stock. *African Journal of Psychiatry*, *15*(6), 402-405.

Lund, C., Myer, L., Stein, D.J., Williams, D.R. & Flisher, A.J. 2013. Mental illness and lost income among adult South Africans. *Social Psychiatry and Psychiatric Epidemiology*, *48*(5), 845-851.

Lustgarten, S.D., Garrison, Y.L., Sinnard, M.T. & Flynn, A.W. 2020. Digital privacy in mental healthcare: current issues and recommendations for technology use. *Current opinion in psychology*, *36*, 25-31.

Luzipho, N., Joubert, P.A. & Dhurup, M. 2023. Job stressors, work tension and job satisfaction of academics at a university in South Africa. *SA Journal of Human Resource Management*, *21*, 2015.

Magamela, M.R., Dzinamarira, T. & Hlongwa, M. 2021. COVID-19 consequences on mental health: An African perspective. *South African Journal of Psychiatry*, *27*(1), 1-2.

Magwegwe, F. 2021. The fourth industrial revolution in the workplace: Career capital, mental health and wellbeing in the future of work. In Ratangee, N. (ed). *Improving Mental Health in the Workplace*. Cape Town: Knowledge Publishing.

Mahoney, A.E., Elders, A., Li, I., David, C., Haskelberg, H., Guiney, H. & Millard, M. 2021. A tale of two countries: Increased uptake of digital mental health services during the COVID-19 pandemic in Australia and New Zealand. *Internet Interventions*, *25*, 100439.

Mak, I.W.C., Chu, C.M., Pan, P.C., Yiu, M.G.C. & Chan, V.L. 2009. Long-term psychiatric morbidities among SARS survivors. *General Hospital Psychiatry*, *31*(4), 318-326.

Makokoane, J.K. 2021. The paradoxical effects of uncertainty: A perspective of South Africa's risk adjusted strategy on Covid-19. *International Journal of Innovation and Economic Development*, *7*(2), .47-63.

Malabou, C. 2008. *What should we do with our brain?* Fordham University Press: New York.

Maphalala, M.C. & Adigun, O.T. 2021. Academics' Experience of Implementing E-Learning in a South African Higher Education Institution. *International Journal of Higher Education*, *10*(1), 1-13.

Maree, K. & Pietersen, J. 2019. Surveys and the use of questionnaires. In Maree, J. (Ed). *First steps in research*. 3rd Ed. Pretoria: Van Shaik Publishers.

Marin, M.F., Lord, C., Andrews, J., Juster, R.P., Sindi, S., Arsenault-Lapierre, G., Fiocco, A.J. & Lupien, S.J. 2011. Chronic stress, cognitive functioning and mental health. *Neurobiology of learning and memory*, *96*(4), 583-595.

Martinez-Martin, N. & Kreitmair, K. 2018. Ethical issues for direct-to-consumer digital psychotherapy apps: addressing accountability, data protection, and consent. *JMIR Mental Health*, *5*(2), e9423.

Marwaha, S., Durrani, A. & Singh, S. 2013. Employment outcomes in people with bipolar disorder: a systematic review. *Acta Psychiatrica Scandinavica*, *128*(3), 179-193.

Mbunge, E., Batani, J., Gaobotse, G. & Muchemwa, B. 2022. Virtual healthcare services and digital health technologies deployed during coronavirus disease 2019 (COVID-19) pandemic in South Africa: a systematic review. *Global Health Journal*, *6*(2),102-113.

Mbunge, E., Muchemwa, B. & Batani, J. 2022. Are we there yet? Unbundling the potential adoption and integration of telemedicine to improve virtual healthcare services in African health systems. *Sensors International*, *3*, 100152.

Melo, A.I., Sarrico, C.S. & Radnor, Z. 2010. The influence of performance management systems on key actors in universities: the case of an English university. *Public Management Review*, *12*(2), 233-254.

Meltzer, H., Bebbington, P., Brugha, T., Jenkins, R., McManus, S. & Dennis, M.S. 2011. Personal debt and suicidal ideation. *Psychological Medicine*, *41*(4), 771-778.

Melzner, J., Heinze, J. & Fritsch, T. 2014. Mobile health applications in workplace health promotion: an integrated conceptual adoption framework. *Procedia Technology*, *16*, 1374-1382.

Mensah, G.A. 2018. In Memoriam: Professor Bongani Mayosi, 1967 to 2018. *Journal of the American College of Cardiology*, *72*(21), 2671-2673.

Mensah, J. 2019. Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, *5*(1), 1-21.

Mense, E.G., Lemoine, P.A., Garretson, C.J. & Richardson, M.D. 2018. The development of global higher education in a world of transformation. *Journal of Education and Development*, *2*(3), 47-60.

Meyer, J.C., Matlala, M. & Chigome, A. 2019. Mental health care-a public health priority in South Africa. *South African Family Practice*, *61*(5), 25-29.

Meyer, M & Kruger-Pretorius, E. (eds). 2018. *Introduction to human resource management*. Cape Town: Van Schaik Publishers.

Mhlanga, D., Denhere, V. & Moloi, T. 2022. COVID-19 and the Key Digital Transformation Lessons for Higher Education Institutions in South Africa. *Education Sciences*, *12*(7), 1-17.

Microfosoft. 2024. *Welcome to Microsoft Forms*. https://support.microsoft.com/en-gb/office/welcome-to-microsoft-forms-29cfe2e6-2f6e-4175-b88b-8fa82be33071 [Accessed 10 June 2024].

Misra, M., Joshi, H., Sarwal, R. & Rao, K.D. 2022. Exit strategies from lockdowns due to COVID-19: a scoping review. *BMC Public Health*, *22*(1), 488.

Mohd, F. & Mustafah, N.I.E. 2021. *"Hello, Dr": A Heatlhcare Mobile Application*. Presented as part of the 4th International Symposium on Agents, Multi-Agent Systems and Robotics (ISAMSR), 20-23.

Molefe, T.O. 2016. Oppression must fall. *World Policy Journal*, *33*(1), 30-37.

Monaghesh, E. & Hajizadeh, A. 2020. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health*, *20*, 1-9.

Moock, J. 2014. Support from the internet for individuals with mental disorders: advantages and disadvantages of e-mental health service delivery. *Frontiers in Public Health*, *2*, 65.

Moonasar, D., Pillay, A., Leonard, E., Naidoo, R., Mngemane, S., Ramkrishna, W., Jamaloodien, K., Lebese, L., Chetty, K., Bamford, L. & Tanna, G. 2021. COVID-19: lessons and experiences from South Africa's first surge. *BMJ Global Health*, *6*(2), e004393.

Moore, J.E., Mascarenhas, A., Bain, J. & Straus, S.E. 2017. Developing a comprehensive definition of sustainability. *Implementation Science*, *12*(1),1-8.

Moosavi, J., Bakhshi, J. & Martek, I. 2021. The application of industry 4.0 technologies in pandemic management: Literature review and case study. *Healthcare Analytics*, *1*, 100008.

Mpofu, F.Y., Mpofu, A., Mantula, F. & Shava, G.N. 2024. Towards the Attainment of SDGs: The Contribution of Higher Education Institutions in Zimbabwe. *International Journal of Social Science Research and Review*, *7*(1), 474-493.

Mpungose, C.B. 2020. Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic. *Humanities and Social Sciences Communications*, *7*(1),1-9.

Mtshweni, B.V. 2022. Covid-19: exposing unmatched historical disparities in the South African institutions of higher learning. *South African Journal of Higher Education*, *36*(1), 234-250.

Muazzam, A., Anjum, A. & Visvizi, A. 2020. Problem-focused coping strategies, workplace bullying, and sustainability of HEIs. *Sustainability*, *12*(24), 10565.

Mulutsi, N.E. 2017. *Implementation of the Mental Health Care Act in Psychiatric Hospitals.* Unpublished Doctoral dissertation. University of the Witwatersrand.

Murairwa, S. 2015. Voluntary sampling design. *International Journal of Advanced Research in Management and Social Sciences*, *4*(2), 185-200.

Murphy, J., Vallières, F., Bentall, R.P., Shevlin, M., McBride, O., Hartman, T.K., McKay, R., Bennett, K., Mason, L., Gibson-Miller, J. & Levita, L. 2021. Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. *Nature communications*, *12*(1), 1-15.

Murphy, M., Scott, L.J., Salisbury, C., Turner, A., Scott, A., Denholm, R., Lewis, R., Iyer, G., Macleod, J. & Horwood, J. 2021. Implementation of remote consulting in UK primary care following the COVID-19 pandemic: a mixed-methods longitudinal study. *British Journal of General Practice*, *71*(704), e166-e177.

Musakuro, R.N. & de Klerk, F. 2021. Academic talent: Perceived challenges to talent management in the South African higher education sector. *SA Journal of Human Resource Management*, *19*, 1394.

Musango, J.K. & Brent, A.C. 2011. A conceptual framework for energy technology sustainability assessment. *Energy for Sustainable Development*, *15*(1), 84-91.

Mushtaq, R., Shoib, S., Shah, T. & Mushtaq, S. 2014. Relationship between loneliness, psychiatric disorders and physical health? A review on the psychological aspects of loneliness. *Journal of Clinical and Diagnostic Research: JCDR*, *8*(9), 1-4.

Mustapha, N. & Ghee, W.Y. 2013. Examining faculty workload as antecedent of job satisfaction among academic staff of higher public education in Kelantan, Malaysia. *Business and Management Horizons*, *1*(1), 10-16.

Mwangama, J., Malila, B., Douglas, T. & Rangaka, M. 2020. What can 5G do for healthcare in Africa? *Nature Electronics*, *3*(1), 7-9.

Naidoo, S., Bottomley, D., Naidoo, M., Donnelly, D. & Thaldar, D.W. 2022. Artificial intelligence in healthcare: Proposals for policy development in South Africa. *South African Journal of Bioethics and Law*, *15*(1), 11-16.

Naidoo-Chetty, M. & du Plessis, M. 2021. Systematic Review of the Job Demands and Resources of Academic Staff within Higher Education Institutions. *International Journal of Higher Education*, *10*(3), 268-284.

Namazi, M. & Namazi, N.R. 2016. Conceptual analysis of moderator and mediator variables in business research. *Procedia Economics and Finance*, *36*, 540-554.

Naslund, J.A., Bondre, A., Torous, J. & Aschbrenner, K.A. 2020. Social media and mental health: Benefits, risks, and opportunities for research and practice. *Journal of Technology in Behavioral Science*, *5*(3), 245-257.

Navarro, C.L.A., Damen, J.A., Takada, T., Nijman, S.W., Dhiman, P., Ma, J., Collins, G.S., Bajpai, R., Riley, R.D., Moons, K.G. & Hooft, L. 2021. Risk of bias in studies on prediction models developed using supervised machine learning techniques: Systematic Review. *BMJ*, *375*.

Neimeyer, R.A., Klass, D. & Dennis, M.R. 2014. A social constructionist account of grief: Loss and the narration of meaning. *Death Studies*, *38*(8), 485-498.

Netswera, F. 2004. *Community Foundations in South Africa: Establishment and Sustenance Challenges*. The Center on Philanthropy and Civil Society: City University of New York.

Ngcobo-Sithole, M.B. & Mabusela, T.E. 2022. Challenges and opportunities in the provision of mental health care services during the COVID-19 pandemic and beyond. *Lessons from COVID-19*, 241-262.

Nhaitayi, R.M. 2014. *Exploring staff perceptions of why selected development NPOs are able to deliver effective services.* Unpublished master's thesis. University of Cape Town.

Nhlapo, T., Somadoda, F., Gobodo-Madikizela, P., Walaza, N. 2020. *Enquiry into the circumstances surrounding Professor Bongani Mayosi's tenure: Crucible for senior Black academic staff*? https://www.news.uct.ac.za/images/userfiles/files/publications/Enquiry_into_the_Circumstances_Surrounding_Professor_Bongani_Mayosi's_Tenure_June2020.pdf [Accessed 25 March 2023].

Niselow, T. Sunday Read: Load shedding through the years and how Eskom has struggled to keep the lights on. https://www.news24.com/fin24/economy/eskom/sunday-read-load-shedding-through-the-years-and-how-eskom-has-struggled-to-keep-the-lights-on-20190324 [Accessed 4 April 2023].

Njenga, J.K. 2011. *eLearning adoption in Eastern and Southern African higher education institutions.* Unpublished Doctoral dissertation. University of the Western Cape.

Noar, S.M. & Harrington, N. G. 2012. *eHealth applications*. In Noar, S.M. & Harrington, N. G. (eds). eHealth applications: Promising strategies for behavior change. New York: Taylor & Francis.

Nordgreen, T., Rabbi, F., Torresen, J., Skar, Y.S., Guribye, F., Inal, Y., Flobakk, E., Wake, J.D., Mukhiya, S.K., Aminifar, A. & Myklebost, S. 2021. Challenges and possible solutions in cross-disciplinary and cross-sectorial research teams within the domain of e-mental health. *Journal of Enabling Technologies*.15(4), 241-251.

Norris, L., Swartz, L. & Tomlinson, M. 2013. Mobile phone technology for improved mental health care in South Africa: Possibilities and challenges. *South African Journal of Psychology*, *43*(3), 379-388.

O'Brien, A., Fahmy, R. & Singh, S.P. 2009. Disengagement from mental health services. *Social Psychiatry and Psychiatric Epidemiology*, *44*(7), 558-568.

Oh, H., Rizo, C., Enkin, M. & Jadad, A. 2005. What is eHealth (3): a systematic review of published definitions. *Journal of Medical Internet Research*, *7*(1), e110.

O'Hagan, A. & Quinn, L. 2018. Mental health a policing challenge for the United Kingdom and the Netherlands. *Forensic Research & Criminology International Journal*, *6*(2).

Okeke-Uzodike, O. & Gamede, V. 2021. The Dilemma of unrelenting workload amidst COVID-19 pandemic: An agenda for University Female Academics. *Journal of Research in Higher Education*, *5*(1), 12-46.

Olawale, B.E., Mutongoza, B.H., Adu, E.O. & Omodan, B.I. 2021. COVID-19 induced psychosocial challenges in South African higher education: Experiences of staff and students at two rural universities. *Research in Social Sciences and Technology*, *6*(3), 179-193.

O'Leary, K., Bhattacharya, A., Munson, S.A., Wobbrock, J.O. & Pratt, W. 2017, February. Design opportunities for mental health peer support technologies. In *Proceedings of the 2017 ACM conference on computer supported cooperative work and social computing, 1470-1484.*

Oliver, M.I., Pearson, N., Coe, N. & Gunnell, D. 2005. Help-seeking behaviour in men and women with common mental health problems: cross-sectional study. *The British Journal of Psychiatry*, *186*(4), 297-301.

Omer, S.B., Salmon, D.A., Orenstein, W.A., Dehart, M.P. & Halsey, N. 2009. Vaccine refusal, mandatory immunization, and the risks of vaccine-preventable diseases. *New England Journal of Medicine*, *360*(19), 1981-1988.

Padilla, M.A. & Thompson, J.N. 2016. Burning out faculty at doctoral research universities. *Stress and Health*, *32*(5), 551-558.

Padín, P.F., González-Rodríguez, R., Verde-Diego, C. & Vázquez-Pérez, R. 2021. Social media and eating disorder psychopathology: A systematic review. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *15*(3).

Pagliari, C., Sloan, D., Gregor, P., Sullivan, F., Detmer, D., Kahan, J.P., Oortwijn, W. & MacGillivray, S. 2005. What is eHealth (4): a scoping exercise to map the field. *Journal of Medical Internet Research*, *7*(1), e391.

Painter-Morland, M., Kirk, S., Deslandes, G. & Tansley, C. 2019. Talent management: The good, the bad, and the possible. *European Management Review*, *16*(1), 135-146.

Parra, L., Sendra, S., Jiménez, J.M. & Lloret, J. 2016. Multimedia sensors embedded in smartphones for ambient assisted living and e-health. *Multimedia Tools and Applications*, *75*, 13271-13297.

Pereira, V. 2017. Journal editors as philosopher kings: duties and responsibilities of academics in a changing world. *South Asian History and Culture*, *8*(3), 360-364.

Perez Vallejos, E., Koene, A., Carter, C.J., Hunt, D., Woodard, C., Urquhart, L., Bergin, A. & Statache, R. 2019. Accessing online data for youth mental health research: meeting the ethical challenges. *Philosophy & Technology*, *32*(1), 87-110.

Petersen, I. & Lund, C. 2011. Mental health service delivery in South Africa from 2000 to 2010: one step forward, one step back. *South African Medical Journal*, *101*(10), 751-757.

Phakathi, B. 2021. *SA universities weigh mandatory jabs for staff and students*. https://www.businesslive.co.za/bd/national/health/2021-09-13-sa-universities-weigh-mandatory-jabs-for-staff-and-students/ [Accessed 11 August 2022].

Pienaar, C. & Bester, C. 2009. Addressing career obstacles within a changing higher education work environment: perspectives of academics. *South African Journal of Psychology*, *39*(3), 376-385.

Pienaar, C. & Bester, C.L. 2008. The retention of academics in the early career phase: Empirical research. *SA Journal of Human Resource Management*, *6*(2), 32-41.

Pietersen, J. & Maree, K. 2019. Standardisation of a questionnaire. In Maree, J. (Ed). *First steps in research*. 3rd Ed. Pretoria: Van Shaik Publishers.

Pillay, P. 2020. Massification at universities of higher learning in South Africa. *Gender & Behaviour*, *18*(1), 1596-9231.

Poalses, J. & Bezuidenhout, A. 2018. Mental health in higher education: A comparative stress risk assessment at an open distance learning university in South Africa. *International Review of Research in Open and Distributed Learning*, *19*(2).

Popescu, F. 2015. South African globalization strategies and higher education. *Procedia-Social and Behavioral Sciences*, *209*, 411-418.

Posiliti, D. & Cilliers, L., 2019. *An Investigation of the Level of E-health Literacy in South Africa*. ICICIS, 12, 261-271.

Pouris, A. & Inglesi-Lotz, R. 2014. The contribution of higher education institutions to the South African economy. *South African Journal of Science*, *110*(3-4), 1-7.

Prasetya, D.D., Wibawa, A.P., Hirashima, T. & Hayashi, Y. 2020. Designing rich interactive content for blended learning: A case study from Indonesia. *Electronic Journal of e-Learning*, *18*(4), 276-286.

Price, M., Yuen, E.K., Goetter, E.M., Herbert, J.D., Forman, E.M., Acierno, R. & Ruggiero, K.J., 2014. mHealth: a mechanism to deliver more accessible, more effective mental health care. *Clinical Psychology & Psychotherapy*, *21*(5), 427-436.

Pywell, J., Vijaykumar, S., Dodd, A. & Coventry, L. 2020. Barriers to older adults' uptake of mobile-based mental health interventions. *Digital Health*, 6, 2055207620905422.

Qan'ir, Y., Khalifeh, A.H., Eid, M., Hammad, B. & Al-Batran, M. 2021. Mobile health apps use among Jordanian outpatients: a descriptive study. *Health Informatics Journal*, *27*(2), 14604582211017940.

Quinlan, C., Babin, B., Carr, J., Griffin, M & Zikmund. W.G. 2015. *Business Research Methods.* 1st ed. London: Cengage Learning.

Qwabe, B.P. 2016. *An investigation into administrative workload and support for academic staff at the Durban University of Technology*. Unpublished masters' dissertation. Durban University of Technology.

Rabe, M. 2022. Telehealth in South Africa: A guide for healthcare practitioners in primary care. *South African Family Practice*, *64*(3).

Rajak, M. & Shaw, K. 2021. An extension of technology acceptance model for mHealth user adoption. *Technology in Society*, *67*, 101800.

Ramdani, B., Chevers, D. & Williams, D.A. 2013. SMEs' adoption of enterprise applications: A technology-organisation-environment model. *Journal of small business and enterprise development*, *20*(4), 735-753.

Ramdani, B., Duan, B. & Berrou, I. 2020. Exploring the Determinants of Mobile Health Adoption by Hospitals in China: Empirical Study. *JMIR Medical Informatics*, 8(7) 1-17.

Ramoupi, N.L.L. 2014. African research and scholarship: 20 years of lost opportunities to transform higher education in South Africa. *Ufahamu: A Journal of African Studies*, 38(1).

Ramrathan, L. 2016. Beyond counting the numbers: Shifting higher education transformation into curriculum spaces. *Transformation in Higher Education*, *1*(1), 1-8.

Ratangee, N. 2021. The post pandemic context: trauma and fatigue. In Ratangee, N. (ed). *Improving Mental Health in the Workplace*. Cape Town: Knowledge Publishing.

Ray, A., Bhardwaj, A., Malik, Y.K., Singh, S. & Gupta, R. 2022. Artificial intelligence and Psychiatry: an overview. *Asian Journal of Psychiatry*, 103021.

Razmak, J. & Bélanger, C. 2018. Using the technology acceptance model to predict patient attitude toward personal health records in regional communities. *Information Technology & People*, *31*(2), 306-326.

Reese, R. J., Slone, N. C., Soares, N. & Sprang, R. 2015. Using telepsychology to provide a group parenting program: A preliminary evaluation of effectiveness. *Psychological Services, 12*(3), 274–282.

Regueiro, V., McMartin, J., Schaefer, C. & Woody, J.M. 2016. Efficacy, efficiency, and ethics in the provision of telepsychology services: Emerging applications for international workers. *Journal of Psychology and Theology*, *44*(4), 290-302.

Reingold, S.M., Hadjipanayis, A., van Esso, D., Del Torso, S., Dornbusch, H.J., de Guchtenaere, A., Pancheva, R., Mujkic, A., Syridou, G., Valiulis, A. & Mazur, A. 2021. COVID-19 era effect on pandemic and post-pandemic pediatric telemedicine use: a survey of the European Academy of Pediatrics Research in Ambulatory Settings Network. *Frontiers in Pediatrics*, 1111.

Rensburg, I., Motala, S. & David, S.A. 2015. Internationalization of higher education: A South African perspective. *Frontiers of Education in China*, *10*(1), 91-109.

Restauri, N. & Sheridan, A.D. 2020. Burnout and PTSD in the COVID-19 Pandemic: Intersection, Impact and Interventions. *Journal of the American College of Radiology*, 17(7), 921-926.

Ricciardi, L., Mostashari, F., Murphy, J., Daniel, J.G. & Siminerio, E.P. 2013. A national action plan to support consumer engagement via e-health. *Health Affairs*, *32*(2), 376-384.

Robbins, S. P., Judge, T. A., Odendaal, A. & Roodt, G. 2019. *Organisational behaviour: Global and South African perspectives*. Cape Town, South Africa: Pearson Education.

Rochlen, A.B., Zack, J.S. & Speyer, C. 2004. Online therapy: Review of relevant definitions, debates, and current empirical support. *Journal of clinical Psychology*, *60*(3), 269-283.

Röhricht, F., Padmanabhan, R., Binfield, P., Mavji, D. & Barlow, S. 2021. Simple Mobile technology health management tool for people with severe mental illness: a randomised controlled feasibility trial. *BMC Psychiatry*, *21*, 1-16.

Rooksby, M., Elouafkaoui, P., Humphris, G., Clarkson, J. & Freeman, R. 2015. Internet-assisted delivery of cognitive behavioural therapy (CBT) for childhood anxiety: systematic review and meta-analysis. *Journal of Anxiety Disorders*, *29*, 83-92.

Rothmann, S., Barkhuizen, N. & Tytherleigh, M.Y. 2008. Model of work-related ill health of academic staff in a South African higher education institution. *South African Journal of Higher Education*, *22*(2), 404-422.

Rowell, K. & Thomley, R. 2013. *Recovering emotionally from disaster*. https://www.apa.org/topics/disasters-response/recovering [Accessed 8 August 2022].

Rubeis, G. 2021. E-mental health applications for depression: an evidence-based ethical analysis. *European Archives of Psychiatry and Clinical Neuroscience*, *271*(3), 549-555.

Rudd, B.N. & Beidas, R.S. 2020. Digital mental health: the answer to the global mental health crisis? *Journal of Medical Internet Research Mental Health*, *7*(6), 1-5.

Rule, P. & John, V. 2011. *Your guide to case study research*. Pretoria: Van Schaik.

Ryan, J. & Carroll, J. 2005. 'Canaries in the coalmine': International students in Western universities. In Carroll, J & Ryan, J. (eds). *Teaching International Students.* London: Routledge.

Ryan, M.L., Shochet, I.M. & Stallman, H.M. 2010. Universal online interventions might engage psychologically distressed university students who are unlikely to seek formal help. *Advances in Mental Health*, *9*(1), 73-83.

Sabzalieva, E. 2020. Emerging issues in the internationalization of Canadian higher education. *Canadian Journal of Higher Education*, *50*(4), 1-10.

SADAG. 2016. *New study in SA workplace: Depression Impairs Employees' Intellectual Functioning*. https://www.sadag.org/index.php?option=com_content&view=article&id=2391:new-research-on-depression-in-the-workplace&catid=11&Itemid=101 [Accessed 2 August 2022].

Safi, S., Thiessen, T. & Schmailzl, K.J. 2018. Acceptance and resistance of new digital technologies in medicine: qualitative study. *JMIR Research Protocols*, *7*(12), 11072.

Sahu, P., 2020. Closure of universities due to Coronavirus Disease 2019 (COVID-19): impact on education and mental health of students and academic staff. *Cureus*, *12*(4), 1-13.

Salahuddin, M. & Gow, J. 2016. The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, *33*(4), 1141-1154.

Sandberg, J. & Alvesson, M. 2021. Meanings of theory: Clarifying theory through typification. *Journal of Management Studies*, *58*(2), 487-516.

Sartorius, N. 2006. The meanings of health and its promotion. *Croatian Medical Journal*, *47*(4), 662-664.

Saud, M., Mashud, M.I. & Ida, R. 2020. Usage of social media during the pandemic: Seeking support and awareness about COVID-19 through social media platforms. *Journal of Public Affairs*, *20*(4), e2417.

Saunders, M., Lewis, P. & Thornhill, A. 2009. *Research Methods for Business Students*. 5th ed. Harlow: Pearson Education Limited.

Sawyer, R. & Chen, G. 2012. The Impact of social media on intercultural adaptation. *Intercultural Communication Studies*, 21(2), 151-169.

Saxena, S. & Skeen, S. 2012. No Health without Mental Health: challenges and opportunities in global mental health. *African Journal of Psychiatry*, *15*(6), 397-400.

Saxena, S., Funk, M.K. & Chisholm, D. 2015. Comprehensive mental health action plan 2013–2020. *EMHJ-Eastern Mediterranean Health Journal*, *21*(7), 461-463.

Scheirer, M.A. & Dearing, J.W. 2011. An agenda for research on the sustainability of public health programs. *American Journal of Public Health*, *101*(11), 2059-2067.

Schroeder, T., Dodds, L., Georgiou, A., Gewald, H. & Siette, J. 2023. Older adults and new technology: mapping review of the factors associated with older adults' intention to adopt digital technologies. *JMIR aging*, *6*(1), e44564.

Schueller, S.M., Washburn, J.J. & Price, M. 2016. Exploring mental health providers' interest in using web and mobile-based tools in their practices. *Internet Interventions*, *4*, 145-151.

Scoones, I. 2007. Sustainability. *Development in Practice*, *17*(4-5), 589-596.

Scott, R.E. & Mars, M. 2013. Principles and framework for eHealth strategy development. *Journal of Medical Internet Research*, *15*(7), e2250.

Seh, A.H., Zarour, M., Alenezi, M., Sarkar, A.K., Agrawal, A., Kumar, R. & Ahmad, K.R. 2020. Healthcare data breaches: insights and implications. *Healthcare,* 8(2), 133.

Sehoole, C. 2006. Internationalisation of higher education in South Africa: A historical review. *Perspectives in Education*, *24*(1), 1-13.

Sekaran, U. & Bougie, R. 2013. *Research Methods for Business: A Skill-Building Approach*. 6th ed. New York: Wiley.

Senekal, Q. & Lenz, R. 2020. Decolonising the South African Higher Education curriculum: An investigation into the challenges. *International Journal of Social Sciences and Humanity Studies*, *12*(1), 146-160.

Shahidi, N. & Seyedi, S.M. 2012. The impact of globalization in higher education on the universities' educational quality: A regional project on Shiraz universities. *World Applied Sciences Journal*, *20*(9), 1300-1306.

Sharifi, A. & Simangan, D. 2021. Environmental Sustainability: The Missing Pillar of Positive Peace. *The Palgrave Handbook of Positive Peace*, 1-19.

Sharma, A., Harrington, R.A., McClellan, M.B., Turakhia, M.P., Eapen, Z.J., Steinhubl, S., Mault, J.R., Majmudar, M.D., Roessig, L., Chandross, K.J. & Green, E.M. 2018. Using digital health technology to better generate evidence and deliver evidence-based care. *Journal of the American College of Cardiology*, *71*(23), 2680-2690.

Sharma, A., Madaan, V. & Petty, F.D. 2006. Exercise for mental health. *Primary care companion to the Journal of clinical psychiatry*, *8*(2), 106.

Sharpe, D. 2015. Chi-square test is statistically significant: Now what? *Practical Assessment, Research, and Evaluation*, *20*(1), 1-10

Shaw, T., McGregor, D., Brunner, M., Keep, M., Janssen, A. & Barnet, S. 2017. What is eHealth (6)? Development of a conceptual model for eHealth: qualitative study with key informants. *Journal of Medical Internet Research*, *19*(10), e8106.

Shrestha, N. 2021. Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics*, *9*(1), 4-11.

Singh, M. 2012. Re-inserting the 'public good' into higher education transformation. In Leibowitz, B. (ed). *Higher education for the public good: views from the south.* Stellenbosch: Trentham Books in association with Sun Media: 1–15.

Singh, P. 2018. Internet of things-based health monitoring system: opportunities and challenges. *International Journal of Advanced Research in Computer Science*, *9*(1), 224-228.

Sinha, C., Meheli, S. & Kadaba, M. 2023. Understanding Digital Mental Health Needs and Usage With an Artificial Intelligence–Led Mental Health App (Wysa) During the COVID-19 Pandemic: Retrospective Analysis. *JMIR Formative Research*, *7*(1), e41913.

Sligo, J., Gauld, R., Roberts, V. & Villa, L. 2017. A literature review for large-scale health information system project planning, implementation and evaluation. *International Journal of Medical Informatics*, *97*, 86-97.

Smith, B. & Magnani, J.W. 2019. New technologies, new disparities: the intersection of electronic health and digital health literacy. *International Journal of Cardiology*, *292*, 280-282.

Smith, M., Segal, J. & Robinson, L. 2021. *Burnout prevention and treatment*. https://www.helpguide.org/articles/stress/burnout-prevention-and-recovery.htm [Accessed 3 August 2022].

Snoswell, C.L., Taylor, M.L., Comans, T.A., Smith, A.C., Gray, L.C. & Caffery, L.J. 2020. Determining if telehealth can reduce health system costs: scoping review. *Journal of Medical Internet Research*, *22*(10), e17298.

Sonn, I.K., Du Plessis, M., Jansen Van Vuuren, C.D., Marais, J., Wagener, E. & Roman, N.V., 2021. Achievements and challenges for higher education during the COVID-19 pandemic: A rapid review of media in Africa. *International Journal of Environmental Research and Public Health*, *18*(24), 12888.

South Africa. National Planning Commission. 2013. *National development plan vision 2030*. Pretoria: Government Printers.

South Africa. Department of Education. 1997. *White Paper 3. A programme for the transformation of higher education.* Pretoria: Government Printer.

South Africa. Department of Education. 2001. *Higher Education Act*. Pretoria: Government Printer.

South Africa. Department of Education. 2001. *National Plan for Higher Education (NPHE)*. Pretoria: Government Printer.

South Africa. Department of Education. 2008. *The report of the Ministerial Committee into Transformation in Higher Education (MCTHE).* Pretoria: Government Printer.

South Africa. Department of Higher Education and Training. 2022. *Annual Performance Plan 2021/22*. Pretoria: Government Printer.

Sparta, P. 2012. Getting the most out of social learning: Utilizing social media in the workplace. *Development and Learning in Organizations: An International Journal*, *26*(2), 16-18.

Stander, M.P., Korb, F.A., de Necker, M., de Beer, J.C., Miller-Janson, H.E. & Moont, R. 2016. Depression and the Impact on Productivity in the Workplace: Findings from a South African Survey on Depression in the Workplace. *J Depress Anxiety*, *2*(12), 1-8.

Statistics South Africa. 2018. *National Poverty Lines*. http://www.statssa.gov.za/publications/P03101/P031012018.pdf [Accessed 02 February 2023].

Statistics South Africa. 2022. General household survey 2021. https://www.statssa.gov.za/publications/P0318/P03182021.pdf [Accessed 02 April 2023].

Stirman, S.W., Kimberly, J., Cook, N., Calloway, A., Castro, F. & Charns, M. 2012. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implementation Science*, *7*(1), 1-19.

Stoker, D. J. 1989. Basic sampling methods. In Schnetler, J. (ed). *Survey Methods and Practice.* Pretoria: South Africa: Human Sciences Research Council.

Stoll, J., Müller, J.A. & Trachsel, M. 2020. Ethical issues in online psychotherapy: A narrative review. *Frontiers in Psychiatry*, *10*, 993.

Stormacq, C., Van den Broucke, S. & Wosinski, J. 2019. Does health literacy mediate the relationship between socioeconomic status and health disparities? Integrative review. *Health Promotion International*, *34*(5), e1-e17.

Strydom, A. 2011. *The job satisfaction of academic staff members on fixed-term employment contracts at South African higher education institutions.* Unpublished doctoral dissertation. University of the Free State.

Su, Z., McDonnell, D., Wen, J., Kozak, M., Abbas, J., Šegalo, S., Li, X., Ahmad, J., Cheshmehzangi, A., Cai, Y. & Yang, L. 2021. Mental health consequences of COVID-19 media coverage: the need for effective crisis communication practices. *Globalization and Health*, *17*(1),1-8.

Swartz, L., Kilian, S., Twesigye, J., Attah, D. & Chiliza, B. 2014. Language, culture, and task shifting–an emerging challenge for global mental health. *Global health action*, *7*(1), 23433.

Tagde, P., Tagde, S., Bhattacharya, T., Tagde, P., Chopra, H., Akter, R., Kaushik, D. & Rahman, M.H. 2021. Blockchain and artificial intelligence technology in e-Health. *Environmental Science and Pollution Research*, *28*, 52810-52831.

Tankou Epse Nukunah, C.N., Bezuidenhout, A. & Furtak, A. 2019. The contribution of a private higher education institution to the South African higher education landscape. *South African Journal of Higher Education*, *33*(1), 283-300.

Taylor, C.B. & Luce, K.H. 2003. Computer-and internet-based psychotherapy interventions. *Current directions in Psychological Science*, *12*(1), 18-22.

Tebeje, T.H. & Klein, J. 2021. Applications of e-health to support person-centered health care at the time of COVID-19 pandemic. *Telemedicine and e-Health*, *27*(2), 150-158.

Temesgen, M.W. 2019. *A framework for evaluating telemedicine-based healthcare inequality reduction in Ethiopia: a grounded theory approach*. Unpublished doctoral dissertation. University of South Africa.

Thakkar, J.J. 2020. Structural equation modelling: *Application for Research and Practice*. Warsaw: Springer.

Theron, M., Barkhuizen, N. & Du Plessis, Y. 2014. Managing the academic talent void: Investigating factors in academic turnover and retention in South Africa. *SA Journal of Industrial Psychology*, *40*(1), 1-14.

Tilahun, B. & Fritz, F. 2015. Comprehensive evaluation of electronic medical record system use and user satisfaction at five low-resource setting hospitals in Ethiopia. *JMIR Medical Informatics*, *3*(2), e4106.

Titov, N., Hadjistavropoulos, H.D., Nielssen, O., Mohr, D.C., Andersson, G. & Dear, B.F. 2019. From research to practice: ten lessons in delivering digital mental health services. *Journal of Clinical Medicine*, *8*(8), 1239.

Tomita, A., Kandolo, K.M., Susser, E. & Burns, J.K. 2016. Use of short messaging services to assess depressive symptoms among refugees in South Africa: Implications for social services providing mental health care in resource-poor settings. *Journal of Telemedicine and Telecare*, *22*(6), 369-377.

Tornatzky, L.G., Fleischer, M. & Chakrabarti, K. 1990. *Processes of Technological Innovation*. Lexington: Lexington Books.

Townsend, L. 2022. *Manager and employee orientation presentation to university X on 18 February 2022*, Cape Town, South Africa.

Tricco, A.C., Ashoor, H.M., Cardoso, R., MacDonald, H., Cogo, E., Kastner, M., Perrier, L., McKibbon, A., Grimshaw, J.M. & Straus, S.E. 2015. Sustainability of knowledge translation interventions in healthcare decision-making: a scoping review. *Implementation Science*, *11*(1),1-10.

Trump, L. & Hugo, C. 2006. The barriers preventing effective treatment of South African patients with mental health problems. *African Journal of Psychiatry*, *9*(4), 249-260.

Tuckson, R.V., Edmunds, M. & Hodgkins, M.L. 2017. Telehealth. *New England Journal of Medicine*, *377*(16), 1585-1592.

UNESCO. 2022. *Role of The Role of Higher Education Institutions for Lifelong Learning*. https://www.uil.unesco.org/en/role-higher-education-institutions-lifelong-learning [Accessed 15 August 2022].

United Nations. 2020. *Policy Brief: COVID-19 and the Need for Action on Mental Health*. https://unsdg.un.org/sites/default/files/2020-05/UN-Policy-Brief-COVID-19-and-mental-health.pdf [Accessed 4 August 2020].

University X. 2021. *Annual Report 2021*. Cape Town: South Africa.

University X. 2024. *History of University X.* https://www.cput.ac.za/about/history [Accessed 10 June 2024].

Välimäki, M., Athanasopoulou, C., Lahti, M. & Adams, C.E. 2016. Effectiveness of social media interventions for people with schizophrenia: a systematic review and meta-analysis. *Journal of Medical Internet Research*, *18*(4), 1-14.

Vally, Z. 2006. Cybertherapy: Development and usage in the South African context. *IFE PsychologIA: An International Journal*, *14*(2), 151-165.

Van der Kolk, B. 2000. Posttraumatic stress disorder and the nature of trauma. *Dialogues in clinical neuroscience*, *2*(1), 7-22.

Van der Ross, M.R., Olckers, C. & Schaap, P. 2022. Engagement of Academic Staff Amidst COVID-19: The Role of Perceived Organisational Support, Burnout Risk, and Lack of Reciprocity as Psychological Conditions. *Frontiers in Psychology*, *13*.

Van Dyk, L., Wentzel, M.J., Van Limburg, A.H., Gemert-Pijnen, V. & Schutte, C.S. 2012. Business models for sustained ehealth implementation: Lessons from two continents. *In Proceedings of International Conference on Computers and Industrial Engineering*. July 16-18, 2012; Cape Town, South Africa, 234-250.

Van Niekerk, R.L. & Van Gent, M.M. 2021. Mental health and well-being of university staff during the coronavirus disease 2019 levels 4 and 5 lockdown in an Eastern Cape university, South Africa. *South African Journal of Psychiatry*, *27*(1), 1-7.

Van Slyke, C., Belanger, F., Johnson, R. D., & Hightower, R. 2010. Gender based differences in consumer e-commerce adoption. *Communications of the Association for Information Systems*, 26(1), 17-34.

Van Velthoven, M.H. & Cordon, C. 2019. Sustainable adoption of digital health innovations: perspectives from a stakeholder workshop. *Journal of Medical Internet Research*, *21*(3), 1-8.

Van Wynsberghe, A. & Gastmans, C. 2009. Telepsychiatry and the meaning of in-person contact: a preliminary ethical appraisal. *Medicine, Health Care and Philosophy*, *12*(4), 469-476.

Vandayar, R. 2021. The role of employee support programmes. In Ratanga, N. (ed). *Improving mental health in the workplace*. Randburg: Knowledge Resource Publishing.

Vardi, I. 2009. The impacts of different types of workload allocation models on academic satisfaction and working life. *Higher education*, *57*, 499-508.

Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478.

Verger, A. & Hermo, J.P. 2010. The governance of higher education regionalisation: comparative analysis of the Bologna Process and MERCOSUR-Educativo. *Globalisation, Societies and Education*, *8*(1), 105-120.

Vos, T., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulkader, R.S., Abdulle, A.M., Abebo, T.A., Abera, S.F. & Aboyans, V. 2017. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, *390*(10100), 1211-1259.

Vos, T., Barber, R.M., Bell, B., Bertozzi-Villa, A., Biryukov, S., Bolliger, I., Charlson, F., Davis, A., Degenhardt, L., Dicker, D. & Duan, L. 2015. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, *386*(9995), 743-800.

Waghid, Y. 2015. Are doctoral studies in South African higher education being put at risk? *South African Journal of Higher Education*, *29*(5), 1-7.

Walker, R.S. & Brown, I. 2020. Big data analytics adoption: A case study in a large South African telecommunications organisation. *South African Journal of Information Management*, *21*(1), 1-10.

Wang, P.S., Aguilar-Gaxiola, S., Alonso, J., Angermeyer, M.C., Borges, G., Bromet, E.J., Bruffaerts, R., De Girolamo, G., De Graaf, R., Gureje, O. & Haro, J.M., 2007. Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. *The Lancet*, *370*(9590), 841-850.

Wang, W., Sun, L., Liu, T. & Lai, T. 2022. The use of E-health during the COVID-19 pandemic: a case study in China's Hubei province. *Health Sociology Review*, *31*(3), 215-231.

Wang, Y., Kung, L. & Byrd, T.A. 2018. Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations. *Technological Forecasting and Social Change*, *126*, 3-13.

Wangenge-Ouma, G. & Kupe, T. 2022. *Seizing the COVID-19 conjuncture: Re-positioning higher education beyond the pandemic*. In Mogaji, E., Jain, V., Maringe, F. & Hinson, R.E (eds). Re-imagining educational futures in developing countries: Lessons from global health crises. Cham: Palgrave Macmillan.

Wangenge-Ouma, G. & T. Kupe. 2020. *Uncertain Times: Re-imagining universities for new, sustainable futures*. https://www.usaf.ac.za/wp-content/uploads/2020/09/Uncertain-Times-Paper.pdf [Accessed 09 October 2022].

Wankel, C., Marovich, M. & Stanaityte, J. 2010. *Cutting-edge Social Media Approaches to Business Education: Teaching with LinkedIn, Facebook, Twitter, Second Life, and Blogs.* USA: IAP- Information Age Publishing, Inc.
Wanyoike, D.M., Mukulu, E. & Waititu, A.G. 2012. ICT attributes as determinants of e-commerce adoption by formal small enterprises in urban Kenya. *International Journal of Business and Social Science*, *3*(23), 1-10.

Watts, S., Mackenzie, A., Thomas, C., Griskaitis, A., Mewton, L., Williams, A. & Andrews, G., 2013. CBT for depression: a pilot RCT comparing mobile phone vs. computer. *BMC Psychiatry*, *13*(1), 1-9.

Westerhof, G.J. & Keyes, C.L. 2010. Mental illness and mental health: The two continua model across the lifespan. *Journal of Adult Development*, *17*(2), 110-119.

Wies, B., Landers, C. & Ienca, M. 2021. Digital Mental Health for Young People: A Scoping Review of Ethical Promises and Challenges. *Frontiers in Digital Health*, 91.

Wiljer, D., Urowitz, S., Apatu, E., DeLenardo, C., Eysenbach, G., Harth, T., Pai, H. & Leonard, K., 2008. Patient accessible electronic health records: exploring recommendations for successful implementation strategies. *Journal of Medical Internet Research*, *10*(4), 1-10.

Willie, M.M. 2017. On Depression and Mental Disorder in South Africa. *Med Clin Rev*, *3,* 1-2.

Winefield, H. R., Boyd, C. & Winefield, A. H. 2014. Work-family conflict and well-being in university employees. *The Journal of Psychology, 148(6),* 683–697.

World Commission on Environment and Development (WCED). 1987. *Our Common Future.* Oxford University Press: New York.

World health Organization. 2001. *Strengthening mental health promotion*. Geneva: World Health Organization.

World health Organization. 2013. *What is mental health?* Geneva: World Health Organization.

World Health Organization. 2016. *Global diffusion of eHealth: Making universal health coverage achievable: report of the third global survey on eHealth*. Geneva: World Health Organization.

World Health Organization. 2017. *Depression and other common mental health disorders: Global health estimates*. Geneva: World Health Organization.

World Health Organization. 2019. Burn-out an "occupational phenomenon": International Classification of Diseases. https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases. [Accessed 10 February 2025].

World Health Organization. 2020. *Digital implementation investment guide (DIIG): integrating digital interventions into health programmes*. Geneva: World Health Organization.

World health Organization. 2020. *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. https://www.who.int/director-general/speeches/detail/who-

director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020#:~:text=WHO%20has%20been%20assessing%20this,be%20characterized%20as%20a%20pandemic. [Accessed 9 August 2022].

World health Organization. 2021. *Depression*. https://www.who.int/news-room/fact-sheets/detail/depression [Accessed 1 August 2022].

World health Organization. 2022. *COVID-19 and mandatory vaccination: ethical considerations: policy brief, 30 May 2022*. file:///C:/Users/Dell/Downloads/WHO-2019-nCoV-Policy-brief-Mandatory-vaccination-2022.1-eng.pdf [Accessed 11 August 2022].

World Health Organization. 2022. *WHO Coronavirus (COVID-19) Dashboard*. https://covid19.who.int/region/afro/country/za [Accessed 9 August 2022].

Xia, Y. & Yang, Y. 2019. RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods*, *51*, 409-428.

Xiang, Y.T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T. & Ng, C.H. 2020. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry*, *7*(3), 228-229.

Yakovchenko, V., McInnes, D.K., Petrakis, B.A., Gillespie, C., Lipschitz, J.M., McCullough, M.B., Richardson, L., Vetter, B. & Hogan, T.P. 2021. Implementing automated text messaging for patient self-management in the veterans health administration: qualitative study applying the nonadoption, abandonment, scale-up, spread, and sustainability framework. *JMIR mHealth and uHealth*, *9*(11), e31037.

Ybarra, M.L. & Eaton, W.W. 2005. Internet-based mental health interventions. *Mental Health Services Research*, *7*(2), 75-87.

Ylijoki, O.H. 2013. Boundary-work between work and life in the high-speed university. *Studies in Higher Education*, *38*(2), 242-255.

Zhang, J., Wu, W., Zhao, X. & Zhang, W. 2020. Recommended psychological crisis intervention response to the 2019 novel coronavirus pneumonia outbreak in China: a model of West China Hospital. *Precision Clinical Medicine*, 3(1), 3-8.

Zhou, L., Rudhumbu, N., Shumba, J., & Olumide, A. 2020. Role of Higher Education Institutions in the Implementation of Sustainable Development Goals. In Nhamo, G. & Mjimba, V. (Eds). The context: SDGs and institutions of higher education. *Sustainable Development Goals and Institutions of Higher Education*. Pretoria: Springer.

Zikmund, W.G., Babin, B. J., Carr, J. C. & Griffin, M. 2013. *Business Research Methods*. 9th Ed. South-Western: Cengage Learning.

Zikmund, W.G., Babin, B.J., Carr, J.C. & Griffin, M. 2009. 8th Ed. *Business research Methods*. South-Western: Cengage Learning.

Zorzenon, R., Lizarelli, F.L. & Daniel, B.D.A. 2022. What is the potential impact of industry 4.0 on health and safety at work? *Safety Science*, *153*, 105802.

APPENDIX A: CPUT ETHICAL CLEARANCE

Cape Peninsula University of Technology

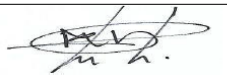
P.O. Box 1906 | Bellville 7535
Symphony Road Bellville 7535
South Africa
Tel: +27 21 4603291
Email: fbmsethics@cput.ac.za

Office of the Chairperson Research Ethics Committee	FACULTY: BUSINESS AND MANAGEMENT SCIENCES

The Faculty's Research Ethics Committee (FREC) on **16 November 2021**, ethics **APPROVAL** was granted to **Rhodrick Musakuro (210227230)** for a research activity for **Doctor of Human Resource Management** at the Cape Peninsula University of Technology.

Title of project:	**A framework for sustainable adoption of e-health tools in delivering digital mental health services at a selected South African university** Researcher (s): Dr L Gie

Decision: APPROVED

	18 November 2021
Signed: Chairperson: Research Ethics Committee	**Date**

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the CPUT Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study requires that the researcher stops the study and immediately informs the chairperson of the relevant Faculty Ethics Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines, and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, notably compliance with the Bill of Rights as provided for in the Constitution of the Republic of South Africa, 1996 (the Constitution) and where applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003 and/or other legislations that is relevant.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after two (2) years for Masters and Doctorate research project from the date of issue of the Ethics Certificate. Submission of a completed research ethics progress report (REC 6) will constitute an application for renewal of Ethics Research Committee approval.

Clearance Certificate No | 2021_FBMSREC 083

APPENDIX B: RESEARCH INSTRUMENT

Questionnaire cover letter

Introduction
My name is Rhodrick Musakuro. I am a registered student for the Doctor of Human Resource Management at Cape Peninsula University of Technology (CPUT). In order for me to complete my degree, I need to submit a thesis and I am required to obtain research data in relation to my research topic. I am requesting your assistance in the completion of this questionnaire.

My request is to please be as open and honest as possible when responding to the questions in this questionnaire. Data obtained from this study will assist in providing clarity on sustainable adoption of e-health tools in the delivery of DMHS at a selected SA university. If the respondent is not completely open and honest, the results will not reflect reality.

Title of the research study
A framework for sustainable adoption of e-health tools in delivering DMHS at a selected SA university.

Purpose of the research
The purpose of this study is to develop a framework for sustainable adoption of e-health tools that will enable a selected university to deliver DMHS to the university staff. In so doing, it will help in the long term continual provision of DMHS, mitigate the impact of mental health issues in SA HEIs and increase access to mental health care to the university staff.

Confidentiality
Any information obtained through this study will remain confidential. Confidentiality will be maintained by means of anonymous input and no names are to be used in statistical data. Only the researcher will have access to the raw data, no member of management or any other person at your institution's Human Capital department or other functional areas will have access to it.

Participation and withdrawal
You may decide whether you are going participate or not. If you do participate, you may withdraw at any time without any consequences. You may also refuse to answer any of the questions. You may not be able to complete some of the questions due to limited knowledge or exposure to the content of the section concerned. This is in order. Try to answer all the questions as best as possible.

Participant: By signing this consent form, you are indicating that you are voluntarily choosing to take part in this survey.

Signature of Participant:_____ Date:_____

Faculty of Business and Management Sciences

Ethics Informed Consent Form

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Category of Participants (tick as appropriate):

Staff/Workers	X	*Teachers*		*Parents*		*Lecturers*	X	*Students*	
Other (specify)		Academic and non-academic administrative staff. Academic staff (junior lecturers, lecturers, senior lecturers, associate professors, professors, researcher fellows) and administrative staff (administrative assistants, managers, technicians, deans).							

You are kindly invited to participate in a research study being conducted by Rhodrick Musakuro from the Cape Peninsula University of Technology. The findings of this study will contribute towards (tick as appropriate):

An undergraduate project		*A conference paper*	*X*
An Honours project		*A published journal article*	*X*
A Masters / Doctoral thesis	*X*	*A published report*	

Selection criteria

You were selected as a possible participant in this study because you are:

(a) An academic staff (junior lecturers, lecturers, senior lecturers, associate professors, professors, researcher fellows).

(b) An administrative staff (administrative assistants, managers, technicians, deans) employed at the selected university.

The information below gives details about the study to help you decide whether you would want to participate.

Title of the research:

Sustainable adoption of e-health tools in delivering DMHS at a selected SA university.

A brief explanation of what the research involves:

Purpose of the Research: The main aim of the study is to develop a framework for the sustainable adoption of e-health tools that will enable the selected university to deliver DMHS to the university staff.

Research Method: The study will make use of quantitative research methods which involve the collection, analysis, and interpretation of quantitative data.

Potential Benefits: The study will make a significant contribution to the limited body of knowledge through developing a framework for sustainable adoption of e-health tools that will enable the selected university to deliver DMHS to university staff. In so doing, it will help in the long term continual provision of DMHS, mitigate the impact of mental health issues in SA HEIs and increase access to mental health care to university staff.

The study will also contribute towards establishing and developing evidence-based knowledge on the adoption of e-health tools for digital mental health service delivery.

Statement of Confidentiality: Any information obtained through this study will remain confidential. Confidentiality will be maintained by means of anonymous input and no names are to be used in statistical data. Only the researcher will have access to the raw data, no member of management or any other person at your institution's Human Capital department or other functional areas will have access to it.

Procedures

If you volunteer to participate in this study the following will be done:

1. The study participants will be informed about the nature of the study.
2. The participants will be given the choice to participate or not to participate.
3. Participants will be told to be as open and honest as possible when responding to the questions in this questionnaire.
4. Participants will be told that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs.
5. Participants will be given the option of omitting questions they do not want to answer or feel uncomfortable with.
6. Participants will be told that they can withdraw from the study at any given time, should they wish to do so.
7. Participants will be told that questions do not pose any realistic risk of distress or discomfort, either physically or psychologically, to them. You are invited to contact the researchers should you have any questions about the research before or during the study. You will be free to withdraw your participation at any time without having to give a reason.

Kindly complete the table below before participating in the research.

Tick the appropriate column		
Statement	**Yes**	**No**
1. I understand the purpose of the research.		
2. I understand what the research requires of me.		
3. I volunteer to take part in the research.		
4. I know that I can withdraw at any time.		
5. I understand that there will not be any form of discrimination against me as a result of my participation or non-participation.		
6. Comment:		

Please sign the consent form. You will be given a copy of this form on request.

Signature of participant	Date

Researcher

	Name:	Surname:	Contact details:
1.	Rhodrick	Musakuro	0717868372 rmusakuro@gmail.com

Instructions: Please answer all questions. Tick the appropriate block which reflects your answer

(Section A): Demographic information

1. Gender

1.1	Male		
1.2	Female		

2. Race

2.1 African	2.2 White	2.3 Coloured	2.4 Indian	2.5 Asian

3. Age group

3.1	18 – 19	
3.2	20 – 29	
3.3	30 – 39	
3.4	40 – 49	
3.5	50 – 59	
3.6	60 years and older	

4. Highest level of qualification attained

4.1	National Senior Certificate	
4.2	Diploma	
4.3	Undergraduate degree	
4.4	Postgraduate degree	
4.5	Master's degree	
4.6	Doctoral degree	
4.7	Other	

5. Occupation

5.1	Academic staff	
5.2	Non-Academic staff (support staff)	
5.3	Management staff	

6. Employment category

6.1	Permanent employee	
6.2	Fixed-term contract employee	

7. Length of service at the current institution

7.1	0 – 5 years	
7.2	6 – 10 years	
7.3	11 – 15 years	
7.4	16 - 20 years	
7.5	More than 21 years	

Section B: The current state of the adoption of e-health tools

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	I have stable access to internet at home.					
2	I am concerned about the internet cost when using e-health tools to access digital health services.					
3	I regularly utilize multiple devices (such as smartphones, laptops, desktop computer, and tablets) to connect to the internet.					
4	I regularly use social media technologies such as Facebook, Twitter, YouTube, Instagram and WhatsApp.					
5	I regularly search for DMHS on the internet.					
6	Our university offers DMHS for free.					
7	I am aware of different DMHS offered for free by Higher Health, SA Depression and Anxiety Group (SADAG) as well as Momentum Wellness.					
8	I am aware of the fourth industrial revolution (4IR) technologies for DMHS.					
9	I prefer DMHS delivered via e-health tools over traditional in-person mental health services.					

Section C: Experiences gained during the COVID-19 pandemic

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
10	During the COVID-19 pandemic, it was beneficial to use e-health tools to access mental health services digitally.					
11	During COVID-19 pandemic, social media played a significant role for my mental health.					
12	I was satisfied with the digital mental health care services provided through e-health tools during COVID-19.					
13	During COVID-19, my university was committed to the use of e-health tools for DMHS.					
14	During COVID-19, there was a variety of DMHS available at our university.					
15	In the aftermath of COVID-19, I believe that e-health tools are the effective mode of delivering DMHS at my university.					
16	During of COVID-19, installing digital mental health applications played a significant role in my mental health.					
17	During COVID-19, my decision not to use e-health tools was not influenced at all by the absence of a legal framework in SA.					
18	During COVID-19, I was concerned about ethical guidelines for DMHS.					

Section D: Factors that influence the sustainable adoption of e-health tools

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
19	Using e-health tools can provide me with convenient and timely access to useful DMHS.					
20	Using e-health tools can provide me with a broader and wider variety of DMHS than traditional face-to-face services.					
21	Using e-health tools for DMHS is generally user-friendly.					
22	I have a positive feeling towards the use of e-health tools for DMHS.					
23	In the future, I plan to use e-health tools for my mental health more regularly even if they are not mandatory.					
24	E-health tools for DMHS are compatible with our university's existing ICT Infrastructure.					
25	E-health tools for DMHS are complex to adopt in our university.					
26	Top management at our institution is likely to be interested in supporting the adoption of e-health tools for DMHS.					
27	Our university is likely to have the financial resources to support the delivery of DMHS.					
28	Our university is able to source financial resources required to deliver DMHS at our institution.					
29	Our university has the relevant ICT knowledge to deliver DMHS.					
30	If I face any technical issue using e-health tools for DMHS, technical support is available to help in our university.					
31	The size of our university can enable our institution to deliver DMHS through e-health tools.					

32	Our university has the government support to help our institution to deliver DMHS through e-health tools.					
33	Current SA government policies and regulations support our university to use e-health tools for DMHS.					
34	It is important for our university to deliver DMHS through e-health tools to remain competitive.					
35	External support is necessary for our university to deliver DMHS through e-health tools.					

Section E: Strategies that should guide sustainable adoption of e-health tools

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
36	Increasing partnerships with private and public organisations will help my university use e-health tools for DMHS.					
37	Offering financial incentives to university staff will effectively help to promote and significantly increase the adoption of e-health tools.					
38	It is important for our university to partner with internet providers to expand networks in some areas with limited internet access.					
39	It is important for our university to consult with university staff to promote DMHS.					
40	Training university staff on how to use e-health tools for DMHS will help to increase the adoption of these tools at our institution.					
41	Educational initiatives and awareness campaigns about e-health tools for DMHS at our institution will increase adoption of these tools.					
42	Our university need to communicate regularly on the DMHS available.					
43	Our university needs to provide DMHS in different languages from the 12 official SA languages.					
44	DMHS should be supported with some traditional face-to-face services.					
45	Collecting user feedback regularly is essential to assess the effectiveness of DMHS.					
46	Top management support is necessary for the sustainable use of e-health tools for DMHS at our university.					
47	Our university need more resources such as alternative sources of electricity, ICT infrastructure, financial and human resources to deliver DMHS effectively.					
48	Data management and security systems are necessary to protect the privacy and confidentiality of user data used in e-health tools for DMHS at our university.					

49	Data privacy and security policies are necessary at our university regarding the use e-health tools for DMHS.					

Thank you for your participation.

APPENDIX C: STATISTICAL ANALYSIS CERTIFICATE

EVERSCI
Science for everyone

Business Registration
2020/690397/07

4 March 2024

Statistician Certificate

This certificate is issued to state that the Structural Equation Model (SEM) analysis performed in the dissertation "A framework for sustainable adoption of e-health tools in delivering digital mental health services at a selected South African university" by Rhodrick Nyasha Musakuro (student number 210227230) has employed appropriate statistical techniques performed by the undersigned statistician. The final interpretation and thesis are the student's own work and responsibility. Guidance on results interpretation has been provided by the undersigned statistician, however, all responsibility of whether the guidance is implemented, and the quality of research is the student's responsibility.

Carmen Stindt
Statistical Consultant
carmen@eversci.com

Gqeberha, South Africa | info@eversci.com | 073 895 0632

APPENDIX D: LANGUAGE EDITING CERTIFICATE

GRAMMARIAN CERTIFICATE

MELKOZAH CONSULTING PTY LTD

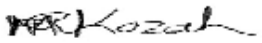
16 September 2024

Dear Sir/ Madam

Re: Confirmation of proofreading of dissertation for **Rhodrick Musakuro**, Student Number 210227230

This confirms that I have proofread and edited the dissertation titled, "***A Framework For Sustainable Adoption of E-Health Tools in Delivering Digital Mental Health Services at a Selected South African University***" and that I have advised the student to make the required changes before submission.

Yours faithfully



MELODY RUMBIDZAI KOZAH CHIRONGA
Editor
melkozah@gmail.com
+27 78 398 7468