THE LIVED EXPERIENCES OF DIAGNOSTIC RADIOGRAPHY STUDENTS UNDERTAKING WORKPLACE LEARNING DURING THE COVID-19 PANDEMIC

by

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DECLARATION

I, Ramona Moodley, declare that the contents of this dissertation represent my own unaided work, and that the 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.

R. Moodley

11 October 2024

Signed: Ramona Moodley **Date**

ABSTRACT

Radiography education serves as the foundation for the radiography profession and plays a crucial role in the development of skilled radiographers. These skilled radiographers must integrate advanced technical skills, extensive knowledge, and the use of complex technologies while providing patient-centred care. Consequently, radiography students undergo stringent training, enabling them to apply theory, techniques, and practical experience effectively in workplace settings before they qualify as radiographers. A core, compulsory, and inherent element of radiography training is workplace learning.

In 2020, the global pandemic COVID-19 had unprecedented effects on healthcare systems, higher education institutions and workplace learning sites. South Africa declared a national state of disaster and implemented an alert level 5 lockdown in March 2020. Consequently, higher education institutions offering radiography had to temporarily discontinue workplace learning until such time students could safely resume their practicum. Once COVID-19 lockdown alert levels eased, radiography students were gradually reintroduced to workplace learning following appropriate COVID-19 training.

Research on a person's lived experience provides direct insight into individual encounters with specific events, leading to a deeper understanding of phenomena. While studies on the lived experiences of radiography students amid the COVID-19 pandemic have been conducted globally, there has been no research focused on radiography students in the Western Cape. Exploring the impact of unprecedented events like COVID-19 on radiography students offers an opportunity to improve higher education programmes. Therefore, this study seeks to explore and describe the lived experiences of 4th-year Bachelor of Science diagnostic radiography students who undertook workplace learning within the Western Cape amid the COVID-19 pandemic.

An exploratory, descriptive and phenomenological qualitative approach was employed to explore, describe and understand the lived experiences of 4th-year BSc diagnostic radiography students who experienced workplace learning during the COVID-19 pandemic. Ethics approval for the study was obtained from the university of interest's Research Ethics Committee. The lived experience of participants was elicited via unstructured focus group interviews, conducted either face-to-face or virtually. Data collection continued until data saturation was achieved, with an additional focus group interview conducted to confirm saturation.

Data analysis was conducted using thematic analysis. Four themes were developed from the analysed data: perspectives towards workplace learning, barriers to effective clinical training, enablers of effective clinical training and coping mechanisms. Based on these themes and the

understanding provided by the participants' lived experience, guidelines and recommendations were formulated to assist educators in supporting students during pandemics.

This study emphasises the need for flexible clinical training frameworks that support radiography students during crises. Adaptable learning models, strong communication, and emotional support to ensure students continue developing essential skills should be prioritised, thereby enhancing the quality of future healthcare education and practices.

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ACRONYMS AND ABBREVIATIONS

BSc	Bachelor of Science
CDC	Centres for Disease Control and Prevention
COVID-19	Coronavirus Disease 2019
CT	Computed tomography
EQ	Emotional intelligence
FG	Focus Group
FGI	Focus group interview
HCW	Healthcare worker
HE	Higher education
HEI	Higher education institution
HPCSA	Health Professions Council of South Africa
MITS	Medical Imaging and Therapeutic Science
MRI	Magnetic Resonance Imaging
NQF	National Qualifications Framework
OSCE	Objective Structure Clinical Examinations
P	Participant
POPI	Protection of Personal Information
PPE	Personal Protective Equipment
REC	Research Ethics Committee
SAQA	South African Qualifications Authority
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
VR	Virtual reality
WHO	World Health Organisation
WIL	Work-integrated learning
WPL	Workplace learning

GLOSSARY

Baby boomers: refers to individuals born between the years 1946-1964 (University of Southern California, 2024). Within this study's context, baby boomers refer to clinical staff aged between 60 – 68 years old.

Clinical tutorials: a method of teaching where students practice their clinical skills under the guidance and supervision of a clinical tutor (Burgess et al., 2014: 452).

Coping mechanism: refers to behavioural and cognitive processes used to manage and adapt to stressful situations or challenges. Coping mechanisms are employed when these challenges surpass an individual's capabilities (Babore et al., 2020: 2).

Coronavirus disease 2019 (COVID-19): a respiratory illness triggered by the novel coronavirus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (Cennimo, 2021).

Disaster: "occurrence of a sudden or major misfortune, which disrupts the basic fabric and normal functioning of a society" (Su et al., 2023: 1).

Epidemic: is "an event in which a disease, infectious or non-infectious, is actively spreading within a population and designated area" (Graham et al., 2021: 231).

Generation X: refers to individuals born between the years 1965-1979 (University of Southern California, 2024). Within this study's context, generation X refer to clinical staff aged between 45 – 59 years old.

Generation Z: refers to individuals born between the years 1995-2012 (University of Southern California, 2024). Within this study's context, generation Z refer to the young radiography students aged between 18 – 29 years old.

Hybrid approach focus group interview: In the context of this study, a hybrid approach FGI refers to an interview conducted exclusively in either a face-to-face or virtual setting**.**

Infection Wave: refers to a pattern characterised by a sudden increase in the number of new infection cases, followed by subsequent declines (Maragakis, 2021).

Millennials: refers to individuals born between the years 1980-1994 (University of Southern California, 2024). Within this study's context, millennials refer to the clinical staff aged between 30 – 44 years old.

Mindfulness: Mindfulness is described as directing one's attention to the present moment in a self-regulated manner while adopting an open, non-judgmental, and accepting stance (Kay & Skarlicki, 2020: 8).

National Qualifications Framework (NQF): a South African system designed to organise and recognise educational and training qualifications. This framework standardises the comparison of qualifications and ensures that they meet established quality standards (South African Qualifications Authority [SAQA], 2023).

Outbreak: Holds the same definition as an "epidemic". However, it is frequently applied to a more limited geographic area (Centres for Disease Control and Prevention, 2012). Within the context of this study, the term refers to infectious outbreaks such as SARS, Ebola and COVID-19.

Pandemic: is "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people" (Graham et al., 2021: 231). COVID-19 was a worldwide pandemic.

Phenomenological reduction: involves suspending all judgments or beliefs regarding the external world and not assuming anything about everyday reality (Ayton, 2023: 56). This concept assisted the researcher with the bracketing process.

Practicum: "a period of work that provides the student with the opportunity for practical experience in the real world as part of an academic programme" (Winberg et al., 2011: 74). The BSc: Radiography programme at the university under study, incorporate practicums during the clinical block of their curriculum.

Psychological stress: is a response to stimuli that is both new and unpredictable, leading to uncontrolled reactions that may pose a risk to individuals. (Wang et al.,2021: 1).

Psychological stress: is an explicit reaction to stimuli that is new, uncontrollable and unpredictable and can cause harm to individuals (Wang et al.,2021: 1).

Reflection: is a process where students derive meaning from their experiences. This process has multiple benefits, including increased confidence, enhanced self-awareness, and the ability to make connections between coursework and personal experiences (Weber & Myrick, 2018: 14).

SharePoint: is a Microsoft cloud-based service that provides a secure platform for storing, organising, sharing, and accessing information (Microsoft, 2024).

Telecommuting: Working from home or other remote locations, communicating with the usual workplace via electronic or other means, instead of commuting to a distant work site (Mokhtarian, 1991).

Urban green and blue spaces: refer to areas within a city or urban environment that feature natural and semi-natural elements like parks, gardens, rivers, lakes, and other water bodies.

These spaces provide recreational opportunities, promote physical activity, improve mental well-being, and enhance community connections (Sunita et al., 2023: 1). A rejuvenation room and a tea garden are mentioned.

Virtual reality (VR): is a simulated encounter within a three-dimensional (3D), computer-generated environment designed to replicate or simulate the “realities of the physical world” for the user (Means, 2023: 17).

Work-Integrated Learning: is an educational approach or strategy that allows the integration of “academic and workplace practices for the mutual benefit of students and workplaces” (Winberg et al., 2011: 4; Fleming & Pretti, 2019: 1).

Workplace learning: is “a valid learning experience for students in many higher education programmes” (Winberg et al., 2011: 78). It allows the incorporation of theory instilled at higher education institutions with practical experience. Workplace learning (WPL) occurs at an academic hospital where students partake in practica necessary to acquire the skills and knowledge needed for their future qualification. These academic hospitals serve as a learning resource as well as a benchmark for practice (Winberg et al., 2011: 4,78).

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 Introduction

1.1.1 Diagnostic radiography profession

In South Africa, Diagnostic Radiography is recognised as a scarce skill qualification (SAQA, 2021). It is a dynamic discipline within the Radiography profession, utilising ionising radiation and advanced technologies to generate images of the body that are crucial for medical diagnosis and patient treatment (Brant, 2018: 44; Makanjee & Engel-Hills, 2018: 201; Naidoo et al., 2018: 163; Ribeiro et al., 2020: e25). Diagnostic Radiography encompasses various modalities, from fundamental practices like general and trauma radiography to more sophisticated techniques such as theatre imaging, interventional studies, magnetic resonance imaging (MRI), computed tomography (CT), and mammography (Naidoo, 2024: 78). Over the years, not only has the array of imaging techniques expanded but each modality undergoes continuous enhancement and refinement to improve its efficacy in medical diagnosis (Brant, 2018: 44). Within this imaging context, Makanjee and Engel-Hills (2018: 201) emphasise that radiographers play a pivotal role, requiring integration of advanced technical skills, knowledge, and use of complex technology, while also prioritising efficient and compassionate communication with patients. Spacey et al. (2023: 132) further elaborate that radiographers are entrusted with tailoring care according to the clinical history of patients, addressing individual needs, providing thorough explanations of procedures, and encouraging interaction from patients. These aspects align closely with the principles of patient-centered care, where both technological expertise and compassionate communication work together to enhance patient outcomes.

1.1.2 Diagnostic radiography education

As outlined by McNulty et al. (2021: 1044), radiography education remains vital in shaping the radiography profession, serving as a fundamental element in the development of proficient radiographers. In South Africa, the South African Qualifications Authority (SAQA), an organisation responsible for overseeing matters related to the National Qualifications Framework (NQF) Act, ensures the integrity, standards, and quality of qualifications offered by higher education institutes (HEIs), as stipulated within the NQF (SAQA, 2023; Naidoo, 2024: 79). According to SAQA (2021), the purpose of the Diagnostic Radiography qualification is to develop a competent learner who is equipped with the comprehensive knowledge and skills necessary for the Diagnostic Radiography profession, enabling them to apply theory, techniques, and practical experience effectively in workplace settings. Currently, at most

universities in South Africa, an individual must successfully complete a four-year degree in Diagnostic Radiography to be employed as a diagnostic radiographer (Hodgson et al., 2020: 533). In South Africa, the radiography qualification is developed by educational institutions and the Professional Board for Radiography and Clinical Technology under the Health Professions Council of South Africa (HPCSA), meeting international standards (SAQA, 2021). The Bachelor's degree programme is full-time and requires students to pass all courses to graduate, with most clinical training commencing as early as the first year (SAQA, 2021).

Diagnostic Radiography programmes integrate academic learning with a clinical curriculum, referred to as work-integrated learning (WIL) (England et al., 2017: S8; du Plessis, 2018: 16). Work-integrated learning is an educational approach that encourages individuals to learn through practical experiences and reflection, generating knowledge through real-world interactions (Walker & Rossi, 2021: 1). Work-integrated learning seeks to establish a link between teaching and learning, and professional practice (Winberg et al., 2011: 9). Integrated assessment methods included in the South African radiography programmes include “written and oral examinations, problem-solving assignments, projects, presentations, case studies, portfolios, logbooks, clinical reports, assessment of clinical competence through simulated and clinical assessment in situ, Objective Structure Clinical Examinations (OSCE) and the successful completion of a mini-dissertation” (SAQA, 2021).

Du Plessis (2018: 16) explains that in WIL, the academic curriculum encompasses theoretical knowledge whilst the clinical curriculum pertains to workplace learning (WPL). Theoretical components aim to offer students the chance to grasp principles and concepts crucial for professional competency, while clinical practice provides an opportunity for students to comprehend the theoretical rationale behind clinical tasks and gain hands-on experience in executing them (Botwe et al., 2016: 146). Notably, radiographic simulated clinical tutorials foster the development of pre-clinical and clinical skills among students, developing their radiographic positioning, image acquisition, post-processing, and interpretation skills (Sapkaroski et al., 2020: 57). Winberg et al. (2011: 78) emphasise that WPL offers an authentic learning experience across various higher education (HE) programmes. Hodgson et al. (2020: 533) and McNulty et al. (2021: 1045) concur that WPL is a core, compulsory, and inherent element of radiography education. It serves to facilitate the incorporation of theory instilled at HEIs with practical experience. Workplace learning occurs at academic hospitals where students engage in practica necessary to acquire the skills and knowledge needed for their future qualification. These academic hospitals not only serve as learning resources but also set standards for practice (Winberg et al., 2011: 78). Hence, a major component of WIL is WPL within an HPSCA-accredited academic hospital.

According to the four-year Bachelor of Science curriculum at the university under study, WIL is incorporated through a structured approach. This involves a two-week rotation alternating between academic and clinical blocks, with consecutive clinical blocks predominantly scheduled toward the end of the academic year (Faculty of Health and Wellness Sciences, Department of Medical Imaging and Therapeutic Sciences, 2024a: 48). The assessment of WPL competency is facilitated through the completion of yearly logbooks and recorded timesheets (Faculty of Health and Wellness Sciences, Department of Medical Imaging and Therapeutic Sciences. 2024b: 15). As emphasised by Schüttpelz-Brauns et al. (2016: 564) and Omer (2021: 409), logbooks play a prominent role in medical education as it establishes learning objectives and standardises teaching practices within clinical environments, aiming to improve and oversee student learning. Omer (2021: 410) further elucidates that logbooks are integrated into training programmes based on the philosophy of accumulating evidence to validate learning achievements. When crafted and utilised effectively, logbooks not only foster student learning but also aid in student evaluation and contribute to their professional development. Based on the understanding of WPL, it is evident that this type of learning experience is critical to the Radiography profession.

1.1.3 An overview of the COVID-19 pandemic in South Africa

In the early months of 2020, the global pandemic of Coronavirus Disease 2019 (COVID-19), triggered by the novel coronavirus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), emerged (Odedra et al., 2020: 482; Cennimo, 2021). This pandemic exerted immense pressure on healthcare systems worldwide (Alandijany et al., 2020: 839). The World Health Organisation (WHO) (2020) emphasises that the surge in COVID-19 cases heightened the demand for hospitals and healthcare professionals. South Africa, like many other countries, was also greatly impacted by this pandemic. Recognising its severity, South Africa declared a national state of disaster and implemented an alert level 5 lockdown in March 2020 (South Africa. Dept. of Co-Operative Governance and Traditional Affairs, 2020). The primary goal of the lockdown was to reduce the transmission rate of the COVID-19 virus and prepare healthcare facilities for a potential surge in cases (Lewis & Mulla, 2020: 346). The subsequent relaxation of lockdown alert levels reflected a decline in the rate of transmission of the COVID-19 virus and the readiness of the healthcare system to manage COVID-19 cases (South African Government, 2020).

During the lockdown, only essential goods and services were allowed to operate. Thus, many businesses and HEIs classified as non-essential services had to be closed (Made et al., 2021: 2; Gamede et al., 2021: 71). Consequently, student residences had to be vacated, however, a considerable number of students faced challenges in returning to their homes. Higher education institutions had to make provisions for these students in the form of food and hygiene

products, safety precautions and counselling services (Parliamentary Monitoring Group [PMG], 2020). The national lockdown and HEI closure disrupted the WIL curricula for students (Odedra et al., 2020: 483). According to research, the COVID-19 pandemic significantly impacted HEIs, WPL sites, and healthcare professions worldwide, posing substantial challenges within the higher education sector (Currie et al., 2020: 518; Odedra et al., 2020: 485-486; Rainford et al., 2020: 465).

1.1.4 Impact of COVID-19 on radiography education

Higher education institutes were forced to swiftly transition to online pedagogies and telecommuting (Currie et al., 2020: 519; Dhawan, 2020: 7-8; Rainford et al., 2020: 465). Aristovnik et al. (2021: 3) elaborate that for many HEIs, online pedagogy was a novel experience, making the shift to online learning challenging due to limited time for preparation and adjustment to the new teaching and learning platform. This introduced various challenges for both educators and students (Aristovnik et al., 2021: 3). Dhawan (2020: 7) acknowledges that, despite the strengths and challenges associated with online pedagogy and telecommuting, this method of learning was necessary and unavoidable during the unique circumstances of the COVID-19 pandemic.

Radiography students in South Africa are registered with the HPCSA. According to the COVID-19 professional guidelines of the HPCSA (2020), the clinical placement of radiography students is not to render a service but to achieve an academic outcome. Based on the above developments that occurred, WPL for radiography students in South Africa was temporarily suspended (HPCSA, 2020). While many countries adopted a fully online pedagogy for radiography education, WPL could not be easily substituted with remote learning. Hence, HEIs around the world had to adapt to this new environment and modify their curricula by either abandoning or postponing WPL training (Rainford et al., 2020: 465). Rainford et al. (2020: 465) further highlight that radiology departments had to account for the infectious potential of COVID-19 on students. This created uncertainty about the presence of certain seniority levels of radiography students allowed in the clinical environments.

Konstantinidis and Apostolakis (2022: 23) emphasise the significance of virtual reality (VR) systems for radiography students, particularly amid concerns over infection risks in clinical practice due to the COVID-19 pandemic. With the limitations imposed by the COVID-19 pandemic, VR systems have emerged as a valuable tool, providing students with a safe environment to develop their clinical skills. VR systems are instrumental in enhancing technical competencies such as patient positioning, understanding exposure parameter selection, and image evaluation (Rowe et al., 2021: 121; O'Connor et al., 2023: 440). Rowe et al. (2021: 121) and Konstantinidis and Apostolakis (2022: 23) agree that whilst the prohibitive costs of VR

systems may serve as a challenge, the remote learning opportunities offered by VR systems are advantageous to students.

1.1.5 Impact on workplace learning

Within a South African context, numerous radiology departments had to alter their regular operations, focusing predominantly on COVID-19 examinations. This resulted in a reduction in routine patient referrals and patient numbers (Rainford et al., 2020: 465). Some clinical departments were also closed as routine examinations and procedures were either cancelled or rescheduled (Ng, 2021: 223). This was aligned with the lockdown level and aimed at directing healthcare resources and personnel towards the treatment and care of patients with COVID-19. This had a direct influence on the training of radiography students as competency levels were significantly impacted.

In September 2020, the Western Cape Department of Health granted permission for a staggered re-introduction of students into WPL sites following appropriate COVID-19 training. Carefully coordinated preparation proposals and strategies between WPL sites and HEIs were required to ensure the safe resumption of clinical training (Tay et al., 2020: 560). Guidelines advised by the HPCSA (2020) included COVID-19 training, student supervision, regular screening, and the provision of personal protective equipment (PPE). Students had to adapt to multiple changes in the clinical environment to ensure their safety. This re-introduction into the workplace brought forth a whole new array of feelings and experiences.

Research conducted by Rainford et al. (2020: 471-472) delved into the anxieties surrounding clinical placements among radiography students across 12 countries worldwide during the initial phase of the COVID-19 pandemic. Findings revealed that students harboured concerns regarding their health, the potential transmission of the virus to their loved ones, logistical challenges related to travel to WPL sites, and financial constraints. Teo et al. (2021: 359) indicated that students in Singapore felt compelled to navigate a hurried learning environment, attributed to understaffed radiology departments stemming from mandatory COVID-19 medical leave policies and staff reallocation to other COVID-19 sites.

Drawing from the 2003 severe acute respiratory syndrome (SARS) outbreak, Clark (2003: 784) elaborates on how Canada encountered disruptions in WPL and radiology services similar to those observed during the COVID-19 pandemic. According to Lewis and Mulla (2020: 347), radiographers working during the SARS outbreak found their experience stressful. Impacting factors included diminished staff morale, inferior risk management skills, and poor infection control. Nevertheless, after the SARS outbreak, radiographers reported their experience as a valuable opportunity to reflect on their responsibilities, radiography practices, and expertise (Lewis & Mulla, 2020: 347).

Lewis and Mulla (2020: 347) and Akudjedu et al. (2021: 1223) indicate that in South Africa and around the world, the amendment of staff allocations, staff redeployment and extended shift-hours was implemented to curb the spread of COVID-19 amongst radiology staff. In addition, Lewis and Mulla (2020: 347) note that the infection of radiology staff resulted in an increased workload for the remaining staff. Akudjedu et al. (2021: 1220) point out that some of these implementations had adverse effects on the well-being of radiographers. The changing work dynamics, lockdown regulations and adapting to the "new norm" generated a mix of sentiments, leaving radiographers physically, emotionally, mentally, and financially drained (Lewis & Mulla, 2020: 347). Given these challenging working conditions, some radiographers contemplated early retirement and possible career adjustments (Akudjedu et al., 2021: 1223).

1.2 Background and rationale for the study

Akudjedu et al. (2021: 1220) reveal that healthcare workers (HCWs) were three times more likely to contract COVID-19 than other individuals. Therefore, healthcare workers had to implement stringent measures to protect patients, the public, and colleagues from contracting COVID-19; whilst maintaining the availability and quality of healthcare services. Globally, these measures had placed an added strain on HCWs (Akudjedu et al., 2021: 1223).

The HPCSA (2020) emphasised the need for the management of radiology departments to support staff by employing regular debriefings and prioritising the psychological and physical health of radiographers. It can then be argued that if students are placed in the same environment and face the same workplace challenges, they also require similar support mechanisms. Therefore, it is crucial for educators to understand the experiences of diagnostic radiography students who engage in WPL.

Literature illustrates that an understanding of a persons lived experience can be beneficial as it provides knowledge of an individual's first-hand experience (Spier, 2018: 4). Honey et al. (2020: 2) describe some of the benefits of partaking in lived experience research as contentment, professional development, liberation, and hope. Several studies have reported the benefits of learning from the strategies, wisdom, challenges, and success of previous experiences. Spier (2018: 4) and Honey et al. (2020: 2) concur that lived experience research has the ability to bring together the experiences of various individuals to provide a better understanding of a particular phenomenon. Therefore, it was important to explore the experiences of student radiographers who returned to WPL during the pandemic.

Being a HCW or student engaged in WPL during a pandemic can yield both positive and negative impacts (Wang et al., 2021: 1). While some studies have examined the impact of COVID-19 on radiography students, no research has yet investigated the lived experiences of diagnostic radiography students within the Western Cape. Exploring the impact of

unprecedented occurrences, like COVID-19, on radiography students presents an opportunity to improve HE programmes. By delving into students' experiences, educators can refine support structures and better prepare students for similar future occurrences. The insights gained from this research can be invaluable in supporting students during future pandemics.

1.3 Problem statement

The completion of WPL rotations is a prerequisite for meeting the programme requirements of the BSc: Diagnostic Radiography qualification. Given South Africa's experience with the COVID-19 pandemic (South Africa. Department of International relations and Cooperation, 2020), radiography students were required to return to WPL sites where they were exposed to potentially infectious individuals. This exposure, coupled with the fear of self-infection or transmission of the COVID-19 virus to their family, presented significant challenges. Moreover, radiography students had to adjust to a changed work environment with strict hospital protocols, compliance with COVID-19 guidelines, and modifications to their radiography programme. The prospect of returning to this altered WPL environment, whilst simultaneously navigating its obstacles, can induce substantial stress among radiography students (Cushen-Brewster et al., 2021: 1004). However, there is a lack of research on how diagnostic radiography students at the research site experienced WPL during COVID-19. To offer effective support to diagnostic radiography students in the Western Cape, it was important to gain an understanding of the experiences of diagnostic radiography students who undertook WPL during the COVID-19 pandemic. Based on this understanding, guidelines and recommendations for educators to support students during pandemics were formulated.

1.4 Research question

The research question that was developed from the above research problem and background was:

"What was the lived experience of diagnostic radiography students undertaking WPL during the COVID-19 pandemic?"

1.5 Research aims and objectives

1.5.1 Study aim

The aim of this phenomenological study was to explore and describe the lived experiences of diagnostic radiography students who undertook WPL during the COVID-19 pandemic in the Western Cape. Based on this understanding, guidelines and recommendations for educators to better support students during pandemics were formulated.

1.5.2 Study objectives

1) To explore and describe the experiences of 4th-year diagnostic radiography students

who undertook WPL during the COVID-19 pandemic.

2) To formulate guidelines and recommendations for educators to provide support to students during pandemics.

1.6 Research paradigm

According to Kivunja and Kuyini (2017: 26), a research paradigm describes an approach that guides a researcher's evaluation of a research project to determine the appropriate research methods and data analysis techniques. While various research paradigms exist, the constructivist paradigm is particularly well-suited for this present research, as a constructivist research paradigm aims to comprehend the perspectives and experiences of research participants, focusing on uncovering their subjective perceptions (Thompson, 2017: 99). In this study, the application of the constructivist paradigm facilitated the researcher in comprehending the diverse perspectives and lived experiences of WPL as encountered by the participants during the COVID-19 pandemic.

1.7 Research design

A qualitative, exploratory, descriptive, and phenomenological research approach was used. This approach is considered the method of choice when studying experiences in a specific group of individuals (Grossoehme, 2014: 109). This is elaborated on in Chapter 2.

1.8 Research method

The research method is briefly summarised below. Chapter 2 provides a more comprehensive description of the methods used. This study was conducted in two phases:

1.8.1 Phase 1

This study was consistent with naturalistic descriptive phenomenology, whereby the researcher explored and described the “lived experience” of radiography students who worked during the COVID-19 pandemic (DePoy & Gitlin, 2020: 164). Phase one was conducted using focus group interviews. The process of bracketing was adhered to (Neubauer et al., 2019: 93).

1.8.1.1 Research sample and population

A non-probability sampling technique, namely purposive sampling was utilised (DePoy & Gitlin, 2020: 200). The research population included all BSc 4th-year diagnostic radiography students registered during the 2022 academic year. This cohort was selected as this group of diagnostic radiography students experienced the most amount of WPL during the COVID-19 pandemic. The sample size depended on data saturation (Rosenthal, 2016: 511).

1.8.1.2 Recruitment strategy

Due to the researcher being a clinical instructor and working with the 4th-year students, an impartial recruiter (a nuclear medicine clinical instructor) not involved in teaching the 4th-year diagnostic radiography students recruited participants for this research study. Utilising an impartial recruiter was essential to prevent potential coercion, allowing students the freedom of choice in research participation. This impartial recruiter distributed information letters and consent forms (see Appendices A, B and C) to all BSc 4th-year diagnostic radiography students.

1.8.1.3 Data collection

Data collection was conducted using a hybrid approach, offering either face-to-face or virtual FGIs, depending on participant preference. These interviews were scheduled and conducted at the convenience of both the researcher and the students. An open-ended neutral question was presented to capture the comprehensive experience of radiography students: “Tell me about your experience of working during the COVID-19 pandemic?” Additional probing and follow-up questions were employed to gain an in-depth understanding of radiography students' experiences, thoughts, perceptions, sentiments, and knowledge in relation to the initial open-ended inquiry (see Appendix G) (Bolderston, 2012: 70; Rosenthal, 2016: 510). Data collection continued until data saturation was achieved (Rosenthal, 2016: 511), and an additional FGI was conducted to confirm saturation. The researcher recorded reflective field notes to capture her observations and personal insights pertaining to the FGIs that were conducted (see Appendix I).

1.8.1.4 Data analysis

Data analysis occurred concurrently with data collection. Thematic analysis using inductive and deductive approaches was applied. Following the steps of Braun and Clarke (Maguire & Delahunt, 2017: 3354; Caulfield, 2020), the researcher maintained the following steps depicted in Figure 1.1. A full description of the steps involved is discussed in Chapter 2.

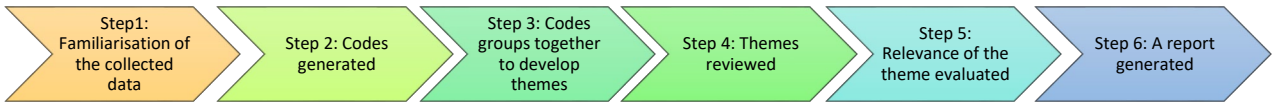

Figure 1.1: Steps to Braun and Clarke’s thematic analysis

Source: Adapted from Caulfield (2020) and Maguire and Delahunt (2017: 3354)

1.9 Phase 2

A description of guidelines and recommendations to assist educators in supporting students during pandemics was formulated. This is discussed in Chapter 4.

1.10 Trustworthiness

Trustworthiness in qualitative research reflects the reliability and integrity of the study's data, interpretations, and methodologies. It encompasses the confidence readers can have in the study's findings and conclusions (Connelly, 2016: 435). Trustworthiness in research studies is established through credibility, transferability, dependability, and confirmability (Kumar, 2019: 276). Table 1.1 gives a brief overview of the trustworthiness methods employed in this study. Each criterion is explained further in Chapter 2.

Table 1.1: Overview of trustworthiness

Criteria	Method
1. Credibility	1.1 Comprehensive engagement with the study's participants to gain understanding of their experiences. 1.2 Researcher reflexivity and bracketing. 1.3 Peer debriefing with research supervisors 1.4 Triangulation of the research data. 1.5 Member-checks
2. Transferability	2.1 The researcher provided extensive and thorough descriptions of the research processes undertaken. 2.2 Analytic summaries and verbatim quotes were also made available to allow for transferability of the study
3. Dependability	3.1 A well-organised audit trail was provided.
4. Confirmability	4.1 Data was collected until data saturation was reached, with an additional FGI conducted to confirm the saturation. 4.2 Rechecking transcripts to ensure accuracy

1.11 Ethical considerations

The ethical principles of autonomy, non-maleficence, beneficence, and justice were adhered to, protecting the dignity, rights and welfare of research participants (WHO, 2013; Pietilä et al., 2019: 49). The protection of personal information act (POPI Act), which aligns with the aforementioned ethical principles, was observed.

1.11.1 Autonomy

Sykes and Dullabh (2012: 222) explain that with student autonomy, HEI students are considered a “vulnerable group” of adults. This is due to the power and knowledge disparities that exist between the student and the lecturer/researcher. Hence the ability to give informed, voluntary consent to participate is of great concern. Jelsma and Clow (2005: 4) and Sykes and Dullabh (2012: 224) emphasise that consent should be an agreement that is continuous, explicit, and uncoerced. To ensure the autonomy of this study, it was accentuated that student participation was completely voluntary. The distribution of information letters and consent forms for voluntary participation was carried out by an impartial recruiter who is not directly involved in the teaching of 4th-year BSc diagnostic radiography students (see Appendices A, B and C). This allowed participants the freedom of choice without feeling coerced by the researcher. Students were reassured that their position in the BSc: Diagnostic Radiography programme would not be influenced by their unwillingness to participate, nor by their decision to withdraw from the study or by any information shared during this study. All information gathered was regarded as private and confidential. To further ensure clarity in roles and minimise any potential power dynamics, it was reiterated at the start of each FGI that the researcher was acting solely in a research capacity, and not as a clinical instructor. This distinction encouraged students to engage openly without perceiving the researcher as an authority figure.

1.11.2 Non-maleficence

Sundean and McGrath (2013: 118) refer to non-maleficence as doing no harm or inflicting the least possible harm to achieve a positive result. Following the guidelines outlined by Jelsma and Clow (2005: 5), the researcher cultivated an atmosphere of trust and openness during the FGIs, where participants felt comfortable sharing confidential information regarding their lived experiences. The researcher ensured the participants' emotional well-being was of utmost concern, acknowledging and dealing with any sensitive topics as they arose in a caring and respectful way. Participants were provided with contact information for the counselling department at the research site in case participants required support for emotional distress resulting from the FGIs. Participants were encouraged to schedule individual counselling or therapy sessions with the team of psychologists or social workers (see Appendix A*)*. It is noted that no emotional instability was expressed during the FGIs. Additionally, this study ensured

the safety and protection of all participants as COVID-19 safety precautions and care were practised. During the face-to-face interviews, COVID-19 protocols such as sanitizing, social distancing and wearing of masks were adhered to.

1.11.3 Beneficence

Farrugia (2019: 50) explains beneficence as the researcher's obligation to ensure that the participants' welfare is continually protected. The benefits of the study should outweigh any risk of harm (Farrugia, 2019: 50). This study did not benefit nor harm the participants as this group of students was phased out when recommendations based on the study findings were made. However, this study aimed to better understand the participants' experiences, and to benefit other students in providing them with the adequate and appropriate support needed during pandemics.

1.11.4 Justice

The principle of justice refers to the participants' right to equal treatment and privacy (Barrow et al., 2020). With the involvement of students (vulnerable groups), the researcher ensured that the participants were not disempowered or exploited (Jelsma & Clow, 2005: 5). They were constantly reminded of their choice to withdraw from the study if they wished to do so. However, data collected up until withdrawal was retained as no identifiers were used during the transcription process. Upholding the right to privacy involves the anonymity of the participants and the confidentiality of the research information (Barrow et al., 2020; Research Integrity & Security, 2021). The names of participants or any form of identifiers were not documented. Upon transcription, the transcriber used pseudonyms. Access to the research information was primarily for the researcher. The research supervisors were only allowed access if necessary. Students were urged to respect the privacy of all individuals by not discussing any information and conversations outside of the focus groups (FGs). All persons, including participants, involved in this study in any way had to sign a confidentiality agreement (see Appendices D and E).

Ethical approval was obtained from the Research Ethics Committee (REC) at the research site. Permission to conduct the study was also obtained from the Head of Department of the Medical Imaging and Therapeutic Science (MITS) department at the HEI (see Appendix F). POPI Act guidelines were adhered to.

1.12 Research outcomes

Possible outcomes include:

- Understanding the experiences of diagnostic radiography students who undertook WPL at various clinical sites amid the COVID-19 pandemic.

- Understanding the impact their experiences had on their lives and learning capacities.
- The development of guidelines and recommendations that will assist educators in providing appropriate support to students during pandemics.
- Having the results of this study published in a Department of Higher Education and Training (DHET) accredited journal to contribute to the body of knowledge in radiography education.

1.13 Structure of chapters

Figure 1.2 outlines the division of chapters. There is no specific literature review chapter, as the conceptualisation of findings with literature is included in Chapter 3.

Figure 1.2: Structure of chapters

CHAPTER 2

RESEARCH DESIGN AND METHODOLOGY

2.1 Introduction

Research design and methodology serve as the framework for carrying out a study, guiding the researcher in the planning and execution of the research to maximize the likelihood of achieving the intended objective (Sileyew, 2020: 1, 2). This chapter includes the research design, methodology, data analysis procedures, and the various elements of trustworthiness related to this research study.

2.2 Research design

Khanday and Khanam (2019: 367) characterise research design as a structured selection of methods and techniques employed by a researcher to integrate different elements of a study in a coherent manner. This ensures effective management of the research problem and provides direction on the implementation of specific methodology. According to Dannels (2019: 402), research design dictates the selection of participants, the incorporation and manipulation of variables, and the methods for collecting and analysing data, all with the aim of addressing the research problem. Dannels (2019: 402) further emphasises that a researcher's conclusions may be compromised if an unsuitable research design is employed.

The research design for this study was qualitative, exploratory, descriptive, and phenomenological. This approach is considered the method of choice when studying experiences in a specific group of individuals (Grossoehme, 2014: 109). Unstructured focus group interviews (FGIs) were conducted since students were able to relate to one another as they have collectively experienced WPL during the COVID-19 pandemic (Silverman, 2014: 166; Kumar, 2019: 239). Focus groups (FGs) facilitate group discussions that encourage participants to interact with one another to generate primary qualitative data (Silverman, 2014: 166). Honey et al. (2020: 1) express that lived experience studies can produce higher quality research by strengthening methodological sensitivity as well as contributing to data accuracy and validity of results. Data was analysed via thematic analysis and guidelines and recommendations for student support were formulated.

2.2.1 Qualitative research design

Qualitative research delves into real-world problems, aiming to gain deeper insights by exploring participants' experiences, perceptions, and behaviours (Tenny et al., 2022). This type of research aims to understand, describe, and occasionally elucidate social phenomena by analysing individuals' or group experiences; analysing interactions and communications as

they unfold, and analysing documents or comparable records of experiences and interactions (Flick, 2011). Tenny et al. (2022) further explain that qualitative research involves asking open-ended questions, enabling the exploration of human behaviour patterns and processes. This approach empowers participants to articulate their emotions, thoughts and experiences, detailing “how, why, or what” participants were feeling, thinking, and experiencing at a specific moment or during an event (Tenny et al., 2022).

The researcher endeavoured to comprehend and portray the experiences of student radiographers who undertook WPL during the COVID-19 pandemic. Analysis was initiated during the FGIs by observing the groups verbal and non-verbal body language.

2.2.2 Exploratory

Stevens et al. (2012: 53) likens exploratory research to “detective work”, highlighting its nature as a search for “clues” to uncover past or present occurrences, while Swedberg (2020: 17) describes exploratory research as the pursuit of discovering something new and intriguing within a research topic. This approach carries inherent uncertainty, as the outcome cannot be predicted in advance, requiring researchers to patiently wait until they are deep into the research process to review its results (Swedberg, 2020: 17). Stevens et al. (2012: 59) mention that FGs are a popular exploratory technique as they facilitate unstructured discussions among small groups, fostering a spontaneous exchange of ideas, feelings, and experiences related to the research topic introduced. Hence, this approach was deemed suitable for this study as the researcher explored the lived experiences of student radiographers, via FGIs.

2.2.3 Phenomenology

Neubauer (2019: 91-92) simply defines phenomenology as the exploration of individuals’ lived experiences from the perspective of the individuals who have encountered them. Qutoshi (2018: 220) outlines the various methods used in phenomenological research, such as observations, interviews, discussions, action research, textual analysis, and focus group meetings. The emphasis is on gaining a deeper understanding of the phenomena as perceived by individuals participating in the research. Neubauer (2019: 92) further elaborates that by analysing these subjective experiences, new meanings and understandings can be obtained to inform, or even reorientate, understandings of these experiences. In the context of this research study, the phenomenon of WPL during the COVID-19 pandemic as lived and experienced by student radiographers in the Western Cape province was explored.

2.2.4 Descriptive

Ayton (2023: 56) highlights that various approaches exist within phenomenology, and in specific research investigations, a descriptive approach may be utilised. Bradshaw et al. (2017: 1) underscore that a qualitative descriptive design is especially pertinent when data is needed

directly from individuals experiencing the phenomenon under investigation. Descriptive design aims to portray individuals, events, or conditions in their natural state, without any manipulation of variables by the researcher. The focus is on describing rather than altering variables (Siedlecki, 2020: 8). Ayton (2023: 56) further elaborates on the importance of removing assumptions and theories in descriptive phenomenology to facilitate phenomenological reduction. This, in turn, leads to the practice of bracketing, where researchers aim to approach the phenomenon as freely and unbiasedly as possible, enabling precise description and understanding (Neubauer, 2019: 93; Ayton, 2023: 56). Chan et al. (2013: 1-2) further explain bracketing as a deliberate and systematic effort by researchers to temporarily suspend their own beliefs, biases, and preconceived notions to approach the study with openness and objectivity. This practice is essential for maintaining the integrity and validity of the research process and ultimately contributes to a more accurate understanding of participants' lived experiences. In this research study, the experiences of student radiographers in the Western Cape province who encountered the COVID-19 pandemic during WPL were described.

2.3 Reasoning strategies

Case (2023) depicts reasoning as the ability to evaluate matters rationally by applying logical thought to both new and existing information when reaching a decision or problem-solving. Initially, the process involves integrating new information with existing knowledge, facilitating a comprehensive review of all available information before embarking on decision-making. Banerjee (2023: 127) expands on this notion, defining reasoning as the utilisation of existing knowledge to derive conclusions, formulate predictions, or establish explanations.

Numerous reasoning strategies exist, yet Alele and Malau-Aduli (2023) advocate the application of inductive reasoning in qualitative research and propose the use of deductive reasoning in quantitative research. However, Armat et al. (2018: 219-220) argue that qualitative content analysis employs a combination of both inductive and deductive reasoning, with a specific emphasis on the dominance of an inductive approach.

2.3.1 Inductive reasoning

Inductive reasoning, as outlined by Alele and Malau-Aduli (2023) involves analysing the collected data to identify patterns and generate themes. Malhotra (2017: 172) further explains that the inductive approach builds generalisations based on observations of specific events. The probability of the general statement's truth increases as more observations demonstrate relations to the phenomena. Verification of these generalisations occurs through observations of the phenomena that appear to support them (Malhotra, 2017: 172). In this study, the researcher conducted a comprehensive analysis of the data obtained from the FGIs, identifying

patterns, and generating codes and themes. The validation of these themes occurred as more participants expressed similar or identical feelings towards the phenomena of interest.

2.3.2 Deductive reasoning

Hyde (2016: 82) states that deductive reasoning in qualitative research serves as a theory-testing process that begins when an established theory or generalisation seeks to determine if the theory applies to specific instances. Building on this perspective, Braun and Clarke (2022: 57) elaborate that deductive reasoning provides a lens for researchers, enabling them to interpret and comprehend data. The researcher notices strong connections to theoretical ideas early in the research process, prompting the researcher to initiate coding based on these identified concepts. In this study, deductive reasoning was used to validate and explain the themes uncovered from the data collected to establish appropriate guidelines and recommendations.

2.4 Research method

Research methods encompass deliberate, scientific, and impartial approaches employed by researchers throughout a study. These methods aid in sample collection, data acquisition, and problem-solving (Goundar, 2012: 10). Williams (2007: 65) states that each research method is tailored to investigate certain research questions and that qualitative research methods enable researchers to delve into and gain deeper insights into the complexities of a phenomenon. This study was conducted in two phases. Phase 1 involved the collection and analysis of the study's data, leading to the identification of key themes and categories. Phase 2 used these findings to formulate guidelines and recommendations.

2.4.1 Phase 1

This study is consistent with naturalistic descriptive phenomenology, whereby the researcher explored and described the “lived experience” of diagnostic radiography students working during the COVID-19 pandemic. Efforts to elicit the lived experience of diagnostic radiography students whilst understanding and conveying the narrative perspective of the individual were made (DePoy & Gitlin, 2020: 164-165). The process of bracketing was adhered to. Bracketing ensured that the researcher’s personal opinion, preconceptions and bias did not influence the descriptions presented by the participants (Neubauer et al., 2019: 93). The researcher utilised field notes to document details of the FGIs. According to Partridge (2021: 88) and Phillippi and Lauderdale (2017: 381), field notes enable researchers to record their impressions and experiences while collecting and reflecting on data. Partridge (2021: 88) further elaborates that researchers often overlook opportunities for reflection during data collection, but employing structured formats for notetaking can help mitigate this challenge. Through consistent recording of impressions and reflections, researchers can enhance the depth and richness of

their research findings (Phillippi & Lauderdale, 2017: 381; Partridge, 2021: 88). In the current study, the researcher made use of structured field notes to document details, observations, and personal reflections from each FGI (see Appendix I).

2.4.1.1 Research population and sample

In order to understand why the specific research population was selected, it is important to understand the context of WPL at the HEI of interest during the COVID-19 pandemic. According to the BSc programme at the HEI of interest, certain student levels are synchronised in their WIL rotations—1st and 3rd-year students, and 2nd and 4th-year students, rotated together for WPL. The COVID-19 pandemic significantly impacted the WPL of students from 2020 to 2021. In March 2020, South Africa went into lockdown, suspending WPL for radiography students (HPCSA, 2020; South Africa. Dept. of Co-Operative Governance and Traditional Affairs, 2020). As lockdown levels eased towards September 2020, students were reintroduced to WPL following appropriate COVID-19 student training. Due to COVID-19 restrictions imposed by the Western Cape Department of Health, such as social distancing and room capacity limits, not all students could attend WPL simultaneously. Priority was given to 3rd and 4th-year radiography students, allowing them uninterrupted WPL. Conversely, 1st and 2nd-year students were organised into split groups. During their two-week WPL rotation, half of the group attended one week, and the other half the following week. Table 2.1 illustrates how different student levels were affected.

Table 2.1: Impact of COVID-19 on WPL for BSc: Radiography Students at the HEI of interest

Group	2020 - Lockdown	2021- Reintroduction of students into WPL	2022 - Year the FGIs was conducted
A	3rd-year: Suspension of WPL; followed by uninterrupted WPL from September 2020 to December 2020	4th-year: Uninterrupted WPL for the year	No longer students at the university of interest
B	2nd-year: Provincial students suspension of WPL; September 2020 to December 2020 - only private sector students allowed in WPL.	3rd-year: Uninterrupted WPL for the year	4th-year: Uninterrupted WPL
C	1st-year: Provincial students suspension of WPL; September 2020 to December 2020 - only	2nd-year: Split group WPL for the year	3rd-year: Uninterrupted WPL

	private sector students allowed in WPL.		
D	N/A	1st-year: Split group WPL for the year	2nd-year: Uninterrupted WPL
E	N/A	N/A	1st-year: Uninterrupted WPL

From the table above, only Groups A and B had uninterrupted WPL in 2021. Therefore, these groups had the most experience with WPL during the COVID-19 pandemic in comparison to the other groups. The researcher received ethical clearance from the university's REC in November 2021. Considering the preparation needed for the FGIs, the researcher could only conduct the interviews in 2022, eliminating Group A since this cohort completed the BSc programme at the end of 2021. Consequently, Group B was the only viable study group for the phenomenon of interest. Thus, the research population included all 4th-year BSc diagnostic radiography students registered during the 2022 academic year (approximately forty-eight students each year). It is important to note that in addition to their year of uninterrupted WPL in 2021, this cohort experienced almost a year-long absence of WPL in their 2nd-year of study. This cohort was also registered with the HPCSA and the BSc Diagnostic Radiography programme at a HEI in the Western Cape. Based on this, sampling the 2022 cohort was deemed appropriate. The sample size depended on data saturation, with an additional FGI conducted to confirm the saturation. Data saturation is a principle used to acknowledge that data collection can cease once no new information is generated (Rosenthal, 2016: 511).

2.4.1.2 Purposive sampling

A non-probability sampling technique, namely purposive sampling was used. This technique focuses on the study of real-life phenomena with a clear rationale needed for the inclusion of individuals (DePoy & Gitlin, 2020: 200). This ensured the collection of information-rich data from this particular group of individuals who were considered proficient and knowledgeable in the specific phenomenon of interest (Etikan et al., 2016: 2).

For this study, **the inclusion criteria** for participants at the study site were:

1) 4th-year students registered with the BSc: Diagnostic Radiography programme.
2) 4th-year diagnostic radiography students registered with the HPCSA.
3) The 2022 cohort of BSc 4th-year diagnostic radiography students who had experienced WPL during the COVID-19 pandemic.

The **exclusion criteria** were:

1) Diagnostic radiography students in their 1st, 2nd and 3rd-year of the BSc: Radiography 2022 programme.

2) Students in years 1 through 4 of the BSc: Radiography programmes specialising in nuclear medicine, radiation therapy, and diagnostic ultrasound.

2.4.1.3 Recruitment strategy

Due to the researcher holding a position as a diagnostic clinical instructor within the Department of Medical Imaging and Therapeutic Sciences (MITS) at the HEI under study, and thus interacting with 4th-year students, an impartial recruiter (a nuclear medicine clinical instructor) not involved in the teaching of BSc 4th-year diagnostic radiography students, was engaged to recruit participants for the research. This decision was taken to avoid potential coercion, allowing students the freedom of choice in research participation. This impartial recruiter distributed information letters and consent forms (see Appendices A, B and C) to all BSc 4th-year diagnostic radiography students via the Blackboard (BB) online learning management platform. Blackboard was selected due to its ability to reach all 4th-year diagnostic radiography students registered for their WPL subject in the BSc: Radiography programme. Blackboard already has the email addresses of students preloaded. This ensured all information letters and consent forms were sent directly to the students in question. Following BB communication, the impartial recruiter addressed the 4th-year diagnostic radiography students at the start of one of their online classes, with permission from the lecturer of the respective class. The recruiter responded to student queries, emphasising the voluntary nature of participation. Informed voluntary consent forms were collected either face-to-face or via electronic submission, depending on participant preference. Various options were provided for submitting signed consent forms, including placing forms in secure boxes at central clinical sites, emailing them to the researcher or impartial recruiter, or presenting them during face-to-face FGs.

2.4.1.4 Data collection

Data collection is an integral part of the research process, empowering researchers to find answers to the research question by systematically gathering information to obtain insights into the research topic (Taherdoost, 2021: 10).

Data collection commenced following ethical clearance from the university's REC, with the approval reference CPUT/HW-REC 2021/H34 (see Appendix H). Unstructured FGIs were chosen for data collection because this method facilitated group discussions among participants who had collectively experienced WPL during the COVID-19 pandemic. These

FGIs were conducted from March to April 2022 using a hybrid approach, depending on participant preference. Following the impartial recruiter's interaction with the 4th-year BSc diagnostic radiography students, students were presented with date and time options for either virtual or face-to-face FGIs during their academic and clinical rotations, respectively. The schedule was sent to students via BB communication and students indicated their participation preference. These interviews were conducted at the convenience of both the researcher (diagnostic clinical instructor) and students. Each FGI included four participants. Further details regarding the hybrid FGI specifications can be found in Table 3.1.

The virtual FGIs were conducted via Zoom and scheduled after lecture times during the students' academic rotation to avoid disrupting their studies. Face-to-face FGIs were held during the students' lunch breaks in their clinical rotation, ensuring it did not interfere with WPL activities. These face-to-face interviews took place on hospital premises, at a venue that was away from the clinical department. This allowed student identities to remain confidential from clinical staff, encouraging openness of experiences.

Creating a relaxed ambience was prioritised in these FGIs. The researcher ensured that she dressed casually to create a relaxed environment. Casual conversation was fostered at the beginning of these hybrid interview sessions which helped set a relaxed tone.

For the virtual FGIs, the researcher conducted the sessions from her place of residence to further encourage a relaxed environment. Participants were asked to turn on their cameras, though not all felt comfortable doing so. Once the formal interview commenced, those with cameras on turned them off, to save bandwidth and avoid connection issues. Due to the researcher not being able to see the participants, non-verbal gestures such as tone of voice, rate of speech, pauses, laughter, sighs and silences were documented. The researcher kept her camera on for the entire duration of the FGI. There were a few technical difficulties, however, these were quickly resolved. During one FGI, a participant experiencing technical issues was unable to rejoin the session. However, the session continued with the remainder of the participants.

For the face-to-face FGIs, a relaxed ambience was also achieved by adhering to COVID-19 protocols to ensure participants felt safe and comfortable. Hand sanitisers were available at the entrance to the interview venue and mask use was encouraged. Tables and chairs were structurally set in a circular pattern, at a safe distance apart, to allow ease of conversation among participants and the researcher. This circular seating arrangement also allowed the audio recorder to be passed around easily. Considering the safe distance between the table and chairs to practice social distancing, participants chose to remove their masks during the interview. This allowed facial expressions to be noted. As the FGIs took place during the

students' lunch break, individually packaged light refreshments (chips, chocolate and cooldrink) were provided. The researcher kept conversation light and easy, engaging with participants before the start of the FGI.

Once the formal FGIs were initiated, it was reiterated that the researcher was acting solely in a research capacity and not as a clinical instructor to encourage free engagement. An open-ended neutral question was posed to capture the in-depth experience of the participants: “Tell me about your experience of working during the COVID-19 pandemic?” Additional probing and follow-up questions were posed to attain an in-depth understanding of radiography students’ experiences, thoughts, perceptions, sentiments, and knowledge regarding the initial open-ended question (Bolderston, 2012: 70; Rosenthal, 2016: 510). The participants were open, eager, and enthusiastic to share their experiences as they were assured that information disclosed during the interview process was confidential.

The researcher, like many individuals around the world, experienced challenges posed by the COVID-19 pandemic. During the course of the pandemic, the researcher worked as both a diagnostic radiographer and a clinical instructor. As a diagnostic radiographer, the researcher had to adhere to strict safety protocols, such as wearing PPE and precautionary isolation. Home routines involving the washing of uniforms were also followed. The fear of potentially transmitting the virus to her family remained a vivid and resonant memory, especially during the FGIs.

As a clinical instructor at the university of interest, the researcher was aware of practices and implementations that could contradict the participants' perspectives. Despite this, the researcher actively engaged in the process of bracketing to ensure a true representation of the participants' experiences. This helped prevent the researcher’s personal experiences and biases from influencing the interpretation of data. By maintaining an open-minded and reflective approach, the researcher upheld objectivity throughout the data collection and research process. Data collection continued until data saturation was achieved (Rosenthal, 2016: 511). Although data saturation was reached by the 3rd FGI, the 4th interview was conducted for verification purposes. The FGIs were audio-recorded for face-to-face interviews and video/audio-recorded for virtual interviews—for later transcription. Additionally, field notes were taken to capture group dynamics and other significant non-verbal communications (Rosenthal, 2016: 512).

Upon transcription of the audio or video recorded interviews, any form of personal identifiers was omitted. The transcriber replaced student names with pseudonyms (see Appendices J, K, L and M for examples of the transcribed verbatim quotes). In line with the Protection of Personal Information Act (POPI Act), all information obtained was anonymised for participant

privacy and securely stored (South Africa, 2019). Research data was stored under password protection on Microsoft OneDrive cloud storage, accessible only to the researcher. Research data will be kept for three years after publication.

2.4.1.5 Data analysis

Wong (2008: 14) defines data analysis as a methodical process of examining and organising observation notes, interview transcripts or other materials collected by the researcher to enhance understanding of the phenomenon under study. For this research study, data analysis occurred concurrently with data collection. Thematic analysis, following the steps of Braun and Clarke as described by Maguire and Delahunt (2017: 3354) and Caulfield (2020), was applied:

Step 1: Familiarisation of the collected data

To ensure the reliability of the transcripts, the researcher rechecked the transcripts against the audio recordings to ensure an accurate capture of events. The researcher familiarised herself with the data collected from the FGIs. The researcher immersed herself in the study data. Reading and re-reading the transcripts, and listening to the interview recordings in conjunction with the documented field notes assisted the researcher in fully understanding the data. This allowed the researcher to zoom in on key sections (Maguire & Delahunt, 2017: 3355; Caulfield, 2020; Frechette et al., 2020: 10).

Step 2: The generation of codes

Codes provide a condensed overview of the main points and common meanings recurring throughout the data. It condenses large amounts of data into smaller chunks of value. These codes are evaluated and grouped together, creating themes (Maguire & Delahunt, 2017: 3355; Caulfield, 2020). The researcher evaluated each FGI transcript highlighting similar patterns and student experiences. Each pattern or experience was colour-coded to assist the researcher in identifying patterns within the data. Once all transcripts were evaluated, different patterns were tabulated into codes.

Step 3: Codes grouped together to develop themes

Each code spoke to a new idea. The researcher grouped similar codes to form themes. Themes are patterns that capture meaningful or fascinating ideas about the data and/or research phenomenon (Maguire & Delahunt, 2017: 3356; Caulfield, 2020).

Step 4: Themes reviewed

The researcher reviewed each identified theme.

Step 5: Relevance of the theme evaluated.

The relevance of each theme was questioned to ensure the true interpretation of the data. There was constant communication between the researcher and supervisors, assessing the relevance of the identified themes. The researcher defined and finalised the themes.

Step 6: A report generated.

A report concluded how the analysis answered the research question (Maguire & Delahunt, 2017: 33512; Caulfield, 2020).

2.4.2 Phase 2

The findings from the data analysis in Phase 1 enabled the formulation of guidelines and recommendations to assist educators in supporting students during pandemics. This is discussed in Chapter 4.

2.5 Trustworthiness

Given the subjective nature of qualitative research, trustworthiness and maintaining transparency in how a study is conducted is crucial to ensure the reliability and integrity of the research findings (Connelly, 2016: 435; Ahmed, 2024: 1). Cypress (2017: 254) refers to trustworthiness as the quality, authenticity, and truthfulness of qualitative research findings. Ahmed (2024: 3) states that the method of triangulation, reflexive journaling, and comprehensive documentation reduces bias and strengthens the reliability of research findings. Ahmed (2016: 3) and Kumar (2019: 276) assert that by ensuring credibility, transferability, dependability and confirmability, researchers can enhance the quality of their research and make valuable contributions to the existing body of knowledge.

2.5.1 Credibility

Cypress (2017: 257) explains credibility simply as the accurate and truthful portrayal of participants' real-life encounters, while Nowell (2017: 3) refers to credibility as the “fit” between the participants’ views and the researcher’s interpretation. Nowell et al. (2017: 3) and Ahmed (2024: 1) propose methods such as prolonged periods of engagement, consistent observation, peer debriefing and triangulation to enhance the credibility of the research endeavour. In addition, Rosenthal (2016: 513) encourages member-checks to boost a study’s credibility.

Ahmed (2024: 2) elaborates on prolonged periods of engagement to involve investing significant time in the field, interacting with, and closely observing the behaviours of participants, allowing researchers to gain comprehensive insights. The researcher engaged at length with participants during the FGIs, making interview notes, observing body language and

tentatively listening for comprehension and understanding of their experiences. Consistent observation requires maintaining an open-minded perspective, acknowledging personal biases, and engaging in self-reflection throughout the entirety of the study process (Ahmed, 2024: 2). The researcher reflected and was aware of her personal biases regarding the phenomenon of interest. The researcher made a conscious effort to bracket those feelings to remain objective throughout the research process.

Debriefing serves as an external validation of the research procedures (Nowell et al., 2017: 3). Peer debriefing involves conducting discussions and meetings with expert qualitative researchers to facilitate questions and constructive feedback on field notes and research activities (Cypress, 2017: 257). Peer debriefing was achieved by the researcher having debriefing sessions with the research supervisors after each FGI. This practice enabled the researcher to share the details of each FGI, ensuring that any residue from one FGI did not influence subsequent FGIs. In addition, the audio recordings of the FGIs were shared with the researcher supervisors, who provided valuable feedback and insight for the improvement of future FGIs.

Stahl and King (2020: 26) characterise triangulation as using multiple sources of information from the field to consistently establish identifiable patterns. The researcher ensured comprehensive field notes were recorded both during and after FGIs. Reflective notes, along with observations and other FGI activities, were documented. After each session, the researcher analysed FGI information, identifying patterns and potential themes. Triangulation of research data was conducted by incorporating audio recordings, transcripts, and field notes to collectively identify patterns and themes in the analysis process.

Member-checks involve providing participants with feedback from the analysis process, allowing them the opportunity to clarify whether the information was accurately interpreted (see Appendix N) (Rosenthal, 2016: 513). The researcher created a document summarising the themes identified from the data analysis process. This document was sent to participants via email and WhatsApp for their review and feedback on the accuracy of the analysed data after the themes and categories were identified.

During the FGIs, the researcher paraphrased students' experiences to confirm their intended meaning and prevent any misunderstandings.

2.5.2 Transferability

Trochim (2020) explains transferability to be the extent to which the findings of qualitative research can be transferred to other contexts or situations. This is achieved by providing extensive and thorough descriptions of the research process for others to follow and replicate

(Kumar, 2019: 277). Trochim (2020) emphasises that it is the responsibility of the reader wanting to transfer the results to make a judgement on how sensible the transfer is. To ensure the transferability of this study, the researcher furnished detailed and thorough descriptions of the research process, research setting, and population group. Additionally, the researcher produced analytical summaries and verbatim quotes. In doing so, fellow researchers can utilise the information and methodologies of this study as a model if seeking to replicate it.

2.5.3 Dependability

Dependability refers to the consistency and reliability of the research findings and the extent to which the results of the study would be the same if the study were repeated with the same (or similar) subjects in the same (or similar) context (Moon et al., 2016: 2). The researcher provided a well-organised audit trail detailing the methodology and processes followed to guarantee the dependability of the study.

2.5.4 Confirmability

Confirmability refers to the extent to which the results of a study can be confirmed or verified by other researchers (Anney, 2014). It establishes that the researcher's interpretations and findings are derived from the data and that it is not biased to their own inclinations and viewpoints. This necessitates the researcher to demonstrate how conclusions and interpretations were attained (Nowell et al., 2017: 3; Korstjens & Moser, 2018: 121-122). Confirmability of this study was established using a comprehensive audit trail which included audio and video recordings, field notes, coding details and transcripts that could be used to verify the study findings. Data was collected until data saturation was reached, with an additional FGI conducted to confirm the saturation. To ensure the reliability of the transcripts, upon receipt of the transcripts from the transcriber, the researcher rechecked them against the audio recordings for accuracy.

2.6 Conclusion

Chapter 2 provided a detailed explanation of the research design and methodology implemented in this study, contributing to the study's audit trail. The following chapter discusses the research findings of this study.

CHAPTER 3

FINDINGS AND DISCUSSIONS

3.1 Introduction

In this chapter, the descriptive findings obtained through hybrid approach FGIs, investigating the lived experiences of radiography students amidst the COVID-19 pandemic are discussed. Data collected during these FGIs was analysed to form themes and categories. Verbatim quotations from the research participants support these themes. Research studies involving radiography and other allied health professions were consulted in order to conceptualise the data. While numerous studies have explored the experiences of radiography students around the world during the COVID-19 pandemic, there is a scarcity of literature specifically focusing on South African radiography students.

3.2 Demographics

The population of this research study included 4th-year radiography students registered for a BSc: Diagnostic Radiography qualification within the Western Cape of South Africa. These participants were also registered with the HPSCA and experienced WPL during the COVID-19 pandemic. A total of 16 participants volunteered for this research study. A hybrid approach for conducting interviews was utilised. The face-to-face FGIs were conducted at a venue and time that was convenient for both the researcher and the participants. A similar arrangement was in place for online FGIs via the Zoom platform. Table 3.1 below represents the details of the hybrid approach FGIs.

Table 3.1: Focus group interview details

Focus Group Interview (FGI)	Type	Number of participants	Duration of interview
FGI 1	Online	4	55 minutes
FGI 2	Online	4	67 minutes
FGI 3	Face-to-face	4	39 minutes
FGI 4	Face-to-face	4	57 minutes

The FGIs were guided by one open-ended neutral question:

“Tell me about your experience of working during the COVID-19 pandemic?”

Probing and follow-up questions were posed to ascertain an in-depth understanding of the participants experiences. Data was collected until data saturation was achieved. Data saturation was achieved by the 3rd FGI and the 4th one was done for verification purposes. The researcher ensured she used reflexivity throughout this process in order to bracket her own personal feelings.

3.3 Description and discussion of the findings

Important and relevant verbatim quotes were extracted from the data collected. These quotes add meaning and value to the research phenomena. Codes were recognised and categories and themes deduced. Maguire & Delahunt (2017: 3353) and Mishra & Dey (2022: 187) explain themes as patterns depicted from data that capture meaningful and fascinating ideas explaining a phenomenon. Four major themes were identified from the data collected. A summary of the themes and categories is presented in Table: 3.2 below.

Table 3.2: Research study themes and categories

Themes	Categories
1. Perspectives towards workplace learning (WPL)	1.1 Mixed emotions about returning to WPL. 1.2 Experiences with Personal Protective Equipment (PPE) 1.3 COVID-19 impact on personal life. 1.4 COVID-19 protocols. 1.5 Adapting to the new clinical environment.
2. Barriers to effective clinical training	2.1 Missed clinical training. 2.2 Radiographer expectations of student competency levels. 2.3 Lack of clinical tutorials 2.4 Difficulty completing logbook
3. Enablers of effective clinical training	3.1 Effective Communication with educators 3.2 Positive student attitudes 3.3 Supportive staff
4. Coping Mechanisms	4.1 Family and peer support 4.2 Educator support

Data analysis and interpretation occurred concurrently and are described below.

3.3.1 Theme 1: Perspectives towards workplace learning

Workplace learning for radiography students has been marked by unprecedented challenges amid the COVID-19 pandemic. Upon their return to the clinical settings, the study participants experienced a combination of emotions, uncertainties, and the need to adapt to new norms. The incorporation of new hospital protocols and screening procedures had further impacted the participants. This theme explores the perspectives of radiography students towards WPL during the COVID-19 pandemic, offering insights into the crucial factors shaping their learning experiences.

3.3.1.1 Category 1.1: Mixed emotions about returning to workplace learning

The participants experienced a range of emotions as they returned to WPL. These emotions encompassed positive outcomes, such as excitement and the ability to learn under pressure, as well as negative experiences, including feelings of trepidation and being overwhelmed at the start of their WPL journey. These emotions are demonstrated in the verbatim quotes below:

> FG1, P8: *…I actually was very excited to work during the Covid period, because like I thought that we could learn a lot more, and like under pressure…*
>
> FG4, P16: *For me personally, I wasn't scared...but it affected…the relationship…like a group relationship in the workplace…you have to kind of be isolated…some people were sceptical…but me personally…I was just fine.*
>
> FG 3, P11*: I think it was overwhelming at the start…*
>
> FG1, P5: *…I actually felt scared…Because in that year we were staying away from people. We were isolating. We were trying to keep safe... So going back to hospital all of a sudden after staying away from people, after…trying to keep that distance apart, it was now a completely different concept, because here we have to touch people.*
>
> FG3, P9: *…I think it was very terrifying to go back to clinicals, especially with a big hospital like X…we've heard how people were dying in this particular hospital. It was constantly on the news, and it's almost like this hospital represented the Western Cape if it came to COVID. So I was scared for my family, for myself…*

Wang et al. (2021: 1) explained that the COVID-19 outbreak was seen as a major social disaster that led individuals to experience psychological stress. Psychological stress has the ability to decrease positive emotions and subjective well-being and increase the negative emotions and psychological discord of individuals. A recent study by O'Connor et al. (2023:

440) demonstrated an instance of how the psychological wellbeing of students was affected by the COVID-19 pandemic. In this article, radiography students from Ireland revealed that at the time of the COVID-19 pandemic, alarming media reports accounted for their initial apprehension of returning to WPL. This was one of the initial concerns expressed by some of the study participants in this current research study.

Although initial fears and challenges arose during WPL amid COVID-19, the literature highlights the enhancement of professional training and the enrichment of individuals' lives (Lawson Jones et al., 2021: 422; O'Connor et al., 2023: 438). In a commentary by Teo et al. (2020: 359) focusing on radiography students in Singapore undertaking WPL during the pandemic, it is described that these students felt privileged to learn amidst such extraordinary circumstances.

Cushen-Brewster et al. (2021: 1000) emphasize that in certain countries, emergency measures were taken in response to the pressures of COVID-19 on the healthcare system. As part of these measures, selected student radiographers were provided with the opportunity to work as temporary registered professionals. These students demonstrated their capability and knowledge by working independently, supporting the operational workflow of their allocated radiology departments (Cushen-Brewster et al., 2021: 1000). As a result, this temporary arrangement led to the development of resilience, autonomy, confidence, and camaraderie among the students (Strudwick et al., 2021; Cushen-Brewster et al., 2021). It is very encouraging to note this change amongst students in literature. While the participants of the current study did not have to register as temporary professions, they did express some positive outcomes from working during COVID-19.

3.3.1.2 Category 1.2: Experiences with Personal Protective Equipment (PPE)

The study participants openly shared their opinions regarding PPE. Many expressed concerns about their inadequate knowledge and training in using PPE correctly. Initially, some individuals felt uneasy while wearing PPE, fearing potential transmission or contraction of the COVID-19 virus due to incorrect usage. However, as time passed, using PPE became a mundane and frustrating routine. The following verbatim quotes emphasize the participants' experiences:

> FG4, P13*: …And the other thing that freaked me out was when we got here at the hospital, we had to put on a personal protective equipment. But then we would walk around like everywhere, even when we are coming out, or coming to the school, we are dressed in this personal protective equipment. I'm like oh no, we are really, really going to get sick here…*

FG4, P14: *…I realised that in third year we didn't know how to wear them properly, because…I was working in Emergency, and then we had to go on a mobile in the – in the red section, and I realised that I didn't know how to put it on properly. I didn't know the proper procedures, because what we were taught to do in second years, to go on the internet again, and follow up with the – I think it was the W.H.O. forum or something that we had to attend, and then we completed a test, online test again. So it was nothing like show and tell, or they didn't show us how to do the things basically properly…*

FG4, S13: *…It was me just getting used to the whole thing. I didn't sort of like follow a routine. I just got used to the whole thing, until they told us that we don't have to wear the personal protective equipment anymore. Then it got better.*

FG3, P11*: And then I think, you get to this point, like I don't care now. I don't even care anymore…Because it's so tiring that you get to that point - this is enough. So I don't care. Lets just, put it on. Get it over with. You don't even think about it…*

Chand et al. (2021: 528) highlight that one of the main strategies that prevent the transmission of the COVID-19 virus in HCWs is the use of PPE. The improper and inconsistent use of PPE amongst HCWs has been listed as one of the causes associated with the high risk of COVID-19 infections. This was a concern that was clearly articulated by the participants of this study. Hence, explicit training for the appropriate donning and safe doffing of contaminated PPE has been recommended to reduce the risk of infection (Smith et al., 2023: 2).

Solis-Barquero et al. (2022: 939) emphasize that providing recommendations and instructions on the proper use of PPE is essential for creating a safe clinical environment for students. However, uncertainty exists regarding the most effective method of educating healthcare workers in PPE utilisation. Whilst this study participants were given a PPE video course to undertake, they still considered themselves unprepared. Smith et al. (2023: 2) suggest that a combination of face-to-face interactions, videos, and computer simulations, results in fewer errors compared to written materials or traditional lectures (Smith et al., 2023: 2). Participants in this study felt that the use of direct small group face-to-face interactive training would have been more beneficial to their knowledge than online videos. A blend of these methods is recommended for better preparing students in the future.

O'Connor et al. (2023: 438) revealed that whilst students recognised the significance of PPE, they expressed discomfort in wearing PPE for extended durations. Some of the challenges encountered were breathing difficulties, claustrophobia, fogged glasses, and difficulties interacting with paediatric and hearing-impaired patients due to the intimidating nature of masks, which hindered lip reading for those with hearing impairments. Additionally, they faced

difficulties identifying staff members, as their faces were obscured by masks (O'Connor et al., 2023: 438). Towards the latter part of their training, the participants in the current study under investigation exhibited a disfavour towards the utilisation of PPE. However, they were not specific about what physical challenges they experienced. PPE became a very monotonous, nonchalant activity. Some participants even lacked confidence in the PPEs ability to protect them. It can then be argued that an increase in the PPE awareness and knowledge level of student's could result in increased confidence levels.

3.3.1.3 Category 1.3: COVID-19 impact on personal life

The participants shared how the COVID-19 pandemic impacted their personal lives. The quotations provided by the participants offer a glimpse into the challenges they faced, ranging from feelings of isolation, fear of being infected and infecting their family. These reflections shed light on the unique struggles encountered by students during this extraordinary time, where uncertainties, anxiety, and a desire for the pandemic to be over were prevalent.

> FG3, P12: *I remember when we were done with clinicals...Then I would like stay at Res for like just a few days, just to make myself feel better…And even at home sometimes…I would now try to like stay in my room for the first few days…. It wasn't nice at all…I just felt like I wanted this whole thing to be over.*

> FG3, P 11: *you are scared to go home to your parents, because maybe you get it, and then you take it back home. So you just stay here. You are very isolated. You don't really even see anyone…I can't remember seeing anyone in my class, except the people I work with.*

> FG 1, P8: *Maybe for me the only incident that happened was when we started off fresh last year, and then a lot of us got sick in the first few weeks...everyone started panicking…is it because of Covid and all that stuff….at that moment I did think that I contracted Covid, because I told my family members, and everyone to stay away from me.*

> FG3, S11: *Even if you were going through something, you are scared to reach out to the – to your other classmates, because you also don't know where they are mentally. And you just don't want to be a burden to someone else.*

A study conducted by Elshami et al. (2022a: S53) on the impact of COVID-19 pandemic on radiography students, showed that students felt vulnerable, stressed, and concerned about contracting the virus, and particularly regarding transmitting it to their loved ones. Similarly, an investigation undertaken by Casafont et al. (2020: 5) involving nursing students amid the COVID-19 pandemic underscores the anxiety and stress experienced by students regarding

the potential transmission of the virus to their family members while engaged in WPL. The experiences of the study participants in this current research align with the findings of existing literature, as they articulated apprehension about contracting the virus and potentially passing it on to their families.

O'Connor et al. (2023: 439-440) found that certain students opted to relocate from their homes while fulfilling their clinical hours to mitigate the potential transmission of the virus to their families. Consequently, this decision resulted in sensations of isolation and financial strain (O'Connor et al., 2023: 439-440). In the present study, some participants were already residing away from home during their studies. When they occasionally visited their families, they had to allocate additional days for self-quarantine as a precautionary measure. Whilst other participants remained at home with their families but had to maintain a safe distance due to the infection risk, leading to sentiments of isolation and loneliness.

3.3.1.4 Category 1.4: COVID-19 protocols

Participants shared their experiences of how the clinical environment endured significant changes with the introduction of essential COVID-19 protocols. Notably, participants were instructed to treat all patients as if they were COVID-19 positive, regardless of their screening results. This was a practice that some found cautionary. Many participants approached the screening protocols with scepticism as they lacked confidence in its effectiveness. Nevertheless, the care and support provided by the clinical staff in helping participants establish a new routine stood out as a positive aspect amidst the changes.

> FG2, P4: *The first week was very hard, because of the many rules now, and we are not familiar…I think also the fast pace environment makes you adjust very quickly to it…*
>
> FG2, P1: *It was a major shift, but I did notice the sanitizers that were all around, and the practice of social distancing, especially, even with us as students, keeping our distance from one another…It felt very weird, because I think it was such a normal, natural human interaction, especially with the students, just to hang out and to laugh and being in each other's…in close proximity….*
>
> FG1, P5: *I was so conscious about even the clothes that I was wearing, because at the time we had to change our uniforms into the hospital gowns …So that also gave me a lot of confidence…at least my clothes won't be contracting anything…*
>
> FG3, P11*: the hospital had like screening forms…It's not a test...how do they actually know if the patient is like being honest…you didn't really know if the screening form says screened negative, if that is actually negative…Because I feel*

you can screen negative, but you can still maybe test positive. So it's not a hundred per cent…

FG2, P2: *It was also on a mobile…with a qualified...qualified was the one who went inside, and I was outside, and I was not allowed to touch the machine, touch the cassette, anything, until everything was cleaned…they would always emphasize the thing of treat everyone as if they are a Covid patient...they kind of helped us to create a routine…*

Amid the COVID-19 pandemic, the importance of thorough hospital infection control measures necessary to avert nosocomial infections and ensure a safe environment for HCWs was crucial (Mardiko et al., 2023: 6). Ramesh et al. (2020: 17) and Dancer (2021: 752) agree that strategies for infection prevention include hand and respiratory hygiene, social distancing, regular staff and patient screening, PPE usage, isolation and heightened cleaning practices. Teo et al. (2020: 359) suggest that staff should be mask-fitted and have their temperature checked daily for early COVID-19 case detection. Mardiko et al. (2023: 4) specify that before HCWs remove their masks during breaks, staff need to be alone in a well-ventilated room. Staggered and strict break times assists with the number of people per room (Dancer, 2021: 752). A 1.5m physical distance was also mandatory during employee smoke breaks (Mardiko et al., 2023: 4). Research conducted by Quigley et al. (2022: 210) in the Republic of Ireland, investigating the experiences of allied health students during WPL, revealed that changes in the clinical environment, increased awareness of the risks individuals face, and adherence to new policies contributed to heightened anxiety levels among many students during the COVID-19 pandemic. Conversely, some participants in Quigley et al.'s (2022: 210) study noted that infection control measures, coupled with consistent support and communication from educators, helped alleviate their anxiety. In the current research study, the protocols were not only new for staff but also students which occasionally presented challenges and caused apprehension, as noted in the quotations presented by the participants.

Mardiko et al. (2023: 2) explain that during the COVID-19 pandemic HCW's were at an increased risk of infection due to their close interaction with patients as well as their colleagues. Dancer (2021: 752) highlights the importance of employing protocols that impede the transmission of the SARS-CoV-2 virus in hospitals settings. Due to the unprecedented nature of COVID-19, recommendations from professional bodies such as the WHO and the Centres for Disease Control and Prevention (CDC), were ever changing and differed at times (Mardiko et al., 2023: 2). Hence, it is of utmost importance that personnel liable for the implementation of infection control protocols in hospitals have a clear strategy for communication of the correct and relevant information to hospital staff in order to avoid any confusion (Mardiko et al., 2023:

2). The changes in protocols as the knowledge of how COVID-19 evolved could be the reason why the participants expressed feelings of scepticism.

3.3.1.5 Category 1.5: Adapting to the new clinical environment

The participants of this study provided insight and gave examples of how they adapted to the new clinical environment during the COVID-19 pandemic. Initially, fears and challenges existed, but through observation and guidance from clinical staff they adjusted to the changes. Notably, one participant made an extra effort to mirror the habits of people around him in an attempt to instil a sense of safety and comfort while working with him.

> FG2, P2: *So my main fear was how it is inside…how is the condition inside the hospital. But then when we got there, we also saw how the staff was handling the things and we also got fine by just observing them and how they are handling the things*
>
> FG1, P5: *We have to fully engage with people, even the staff that we working with. They standing right next to you, just because of that's the nature of our work. So for me, that beginning phase was quite scary, but after a while you start to just get used to it, and, you pick up on the pace that you left off.*
>
> FG2, P1: *We just fell into the behaviour, since everyone was practicing it. I think it was more of just copying, not copying, but modelling the behaviour around us as well*
>
> FG1, P5*: …it was just a lot of change all at once, and just to accept all of that change, was difficult.*
>
> FG4; P16: *I tried to look at things from their (colleagues) perspective, how they see it…what am I supposed to be doing to make them feel a little bit safer around working with me… if maybe a colleague was obsessed with the cleaning of hands a lot, so I will just make sure that then I do that more often and they see that, to make them feel a bit safer…More comfortable working with me.*

The study of O'Connor et al. (2023: 440) found that students experienced heightened concerns about COVID-19 before commencing their clinical placements. This observation is corroborated by Currie et al. (2020: 523), who emphasise that dealing with the unknown was the most formidable challenge for both students and staff. Guidance, policies, workplace dynamics, and the clinical industry all functioned in an ever-changing environment, responding reactively to the immediate situation. Nevertheless, according to O'Connor et al. (2023: 440),

student perspectives changed during their placement as they were influenced by their encounters with supportive clinical staff.

In addition, students felt safer in the clinical environment due to rigorous infection control protocols, as opposed to public spaces. Research conducted by Elshami et al. (2022b: S60) in the UK Devolved Nations (UKDN) and the United Arab Emirates (UAE), on the perspectives of clinical tutors overseeing students in WPL during the COVID-19 pandemic, indicated enhanced clinical confidence among students who were exposed to a COVID-19 environment. Positive clinical learning experiences was further reinforced by the camaraderie and support extended by clinical staff, despite challenging circumstances (O'Connor et al., 2023: 440). The sentiments shared by the participants in this study align with literature, emphasising the pivotal role of clinical staff in fostering positive clinical experiences for participants.

3.3.2 Theme 2: Barriers to effective clinical training

This theme focuses on factors that affected students' learning negatively whilst at WPL. These factors inhibited the participants' ability to effectively partake in clinical training activities. The COVID-19 pandemic posed challenges for HEIs in meeting the training requirements of undergraduate HCWs. Among these obstacles were the temporary suspension of clinical rotations, a decrease in elective cases resulting in reduced clinical exposure for undergraduates, and a lack of face-to-face clinical tutorials (Elshami et al., 2022a: S51).

3.3.2.1 Category 2.1: Missed clinical training

At the beginning of the COVID-19 pandemic, the study participants experienced almost a year-long absence from their clinical training in their second year of study. The participants shared their reflections on how the gap in their clinical training affected them. Participants had to make up for lost time, reacquainting themselves with the curriculum from the previous years together with their current coursework. This situation placed immense pressure on participants, leaving them feeling stressed, lacking confidence, and relatively inexperienced. Some participants came to recognise the profound practical nature of radiography and expressed regret for selecting a career that demanded such extensive hands-on involvement.

> FG1, P6: *…But we were in second year when Covid started…I think it was the whole year that we didn't have any clinical work. So when we got to third year and we were doing clinicals…it felt like I was a newbie in the department again. So I had to like relearn how to take like a basic chest x-ray. And my confidence around patients and stuff like that…wasn't that great.*

> FG1, P5: *…So other than just dealing with your third year…you also need to catch up with what you lacked in your second year. So with all of that, for me it was quite*

stressful. I know some people could cope under the pressure, but personally I felt like I just needed more time…or I just need more training…

FG3, P10*: …We weren't exposed to a lot of specialised departments in our second year. And that caused a disadvantage for myself, because in third year I was expected to do stuff that I wasn't able to do, because I didn't have the experience of it. Maybe we learned something theoretical, but we didn't practice it.*

FG2, P4: *…I wasn't going into the hospital anymore, and I felt like I am forgetting things...the theory part of things was just not making sense to me without me seeing things...like I'm just regretting choosing something that would require so much practical. And I'm not even allowed to do practical's at this point, because of the pandemic…at that point I was really regretting the choice I made.*

Workplace learning affords students the opportunity to employ, enhance, and broaden their knowledge and competencies beyond the boundaries of traditional classroom and simulated tutorial environments (Ncwane & Khoza, 2022: 673). The COVID-19 pandemic significantly impacted the clinical experiences of student radiographers as many HEI's withdrew the majority of their students from clinical placements to curb the transmission of COVID-19 (Rainford et al., 2020: 465; Hinds & Lockwood, 2023: 190). Rainford et al. (2020: 465) further explain that the lack of radiography examination referrals and the reduction in non-emergency patient numbers also contributed to this disruption to clinical training. Consequently, when students gradually returned to their clinical placements, the scarcity of basic examinations put pressure and stress on students as they could not practice examinations or prepare for assessments (Hinds & Lockwood, 2023: 196). In the current study, participants experienced significant disruptions in their clinical training and placements, resulting in the loss of valuable clinical time. Due to a decrease in the number of patients, students were unable to gain exposure to certain departments and examinations, yet they were still expected to know these procedures. This placed undue pressure and stress on participants.

Tay et al. (2020: 561) and Lawal et al. (2022: 488) agree that through clinical training students acquire the necessary skills for their future careers, enabling them to gain practical understanding of their chosen profession. Birtch et al. (2021: 2) state that when individuals experience a negative event, such as COVID-19, their emotions are presumably negatively affected resulting in changes in their attitude and behaviour. COVID-19 affected individuals across a wide diversity of industries. A study conducted by Birtch et al. (2021: 10) among hospitality students in China, aimed to comprehend the influence of COVID-19 on the pursuit of a career in hospitality management, discovered that adverse emotions can detrimentally affect one's professional identity, subsequently influencing their intentions regarding career

choices. Additionally, research conducted by Jones et al. (2021: 421) on the experiences of radiography students in the United Kingdom during the COVID-19 pandemic identified a minority of students who contemplated leaving their radiography programme after enduring the pandemic's challenges. This aligns with the findings of the present study as participants experienced regret about their career choices at the beginning of the pandemic.

3.3.2.2 Category 2.2: Radiographer expectations of student competency levels

The participants described how the radiographers at the hospital made remarks about their insufficient experience given their academic level of study. The participants were compared to first-year students, which left them feeling highly disheartened and as though they were imposing a burden on the staff. The following verbatim quotations provide an account of certain incidents encountered by the participants.

> FG2, P2: *… It would not happen with…every staff member...they don't even realise that the only foundation that we had at that time was first year… that did place a lot of pressure for me…I also remember…an incident like that where a staff member told me that how come you can't do this, but you are in the third year. Look…at the other students. I am like okay, we were not the same, and it has been a while since I was not here…*

> FG4, P14: *…I was very down…There's a lot of pressure…as a third year, because they (staff) expect you to know a lot. So now you there with the first years, and it feels like you are becoming a burden to them, because they have to show you now as a third year, and then they have to show the first year as well, but you are supposed to be the one showing them (1st-years) or helping them out. So now if there are a lot of mobiles, for example, they can't send you with a – with a first year, or if you go with the staff, then you are going to be more of a liability, because you are going to be asking questions, what do I do now, or I don't know what to do, then you delay them in the process.*

> FG4, P15*: …They said we are third years…who are first years…they wouldn't say it like I am nasty or in a bad way. It will come in as a joke…But then when you think about it…it's not funny anymore.*

Tay et al. (2020: 561) and Ncwane and Khoza (2022: 673) concur that during clinical placements, student radiographers undertake activities under the supervision of experienced radiographers, tutors and other clinical staff. These individuals, in conjunction with clinical instructors and academic staff from HEIs, bear the responsibility of imparting essential skills to students, enabling them to fulfil their future roles as proficient, safe and capable radiographers

(McPake, 2020: 37; Tay et al., 2020: 561). Thus, clinical placements should provide an optimal learning opportunity and a conducive environment for students (McPake, 2020: 37).

However, McPake (2020: 37) suggests that in some instances optimal learning opportunities are not guaranteed and that negative emotions in students are perceived as a barrier to learning. Ncwane and Khoza, (2022: 673) emphasise that insufficient clinical training and supervision can lead to diminished student performance and hinder students' ability to bridge the gap between theory and practice. A study conducted by McPake (2020: 37) in the United Kingdom on how the attitudes of therapeutic radiographers affected student learning during clinical placements, revealed that students displayed vulnerability when faced with perceived negative behaviour and attitudes. Moreover, McPake's (2020: 37) study revealed that students struggled to cultivate resilience when faced with similar situations.

The experiences of the present study participants align with existing literature in that they encountered negative emotions in response to the comments received from radiographers. Clinical radiographers play a crucial role in the teaching and learning of student radiographers, however, the experiences of the participants revealed that this role was being misused. Participants felt they were being measured against their peers, including those with less advanced knowledge, which made them perceive themselves as bothersome and burdensome to the radiographers. This constant sense of inadequacy took a toll on their emotional well-being. Moreover, the pressure to enhance their knowledge and catch up with their peers hindered their ability for effective learning.

3.3.2.3 Category 2.3: Lack of clinical tutorials

The participants expressed how the lack of clinical tutorials from HE educators affected their ability to learn effectively. With the transition of HEIs to online pedagogy during the COVID-19 pandemic, students were supplemented with video tutorials. The participants felt that the use of video tutorials was insufficient as they were unable to physically practice positioning techniques typically done in face-to-face clinical tutorials. As the lockdown levels eased and WPL resumed, students were exposed to practical radiographic techniques for the first time by staff members during patient interactions. Usually, these techniques would be demonstrated during the tutorial sessions by educators, however, because of COVID-19, the tutorials were limited. Due to the generational differences in training within the radiography environment, students were often conflicted by the discrepancies in teaching.

> FG 4, P14: *…I think what works with me is more of a like show and tell…in first year we had the clinical tutorials…we actually saw what was going on. The second year as well we had a bit, but we lost a lot of it along the year. And watching YouTube videos and other stuff didn't really help…*

> FG4, P16: *…we had to do an assessment…clinical assessments… like for example a mobile. So of course, we didn't have much exposure doing mobiles. And then we didn't have, I can't even remember the TUT…We didn't get any physical tutorial…*
>
> FG4, P14: *…people from the department are from a totally different generation. They know different ways of positionings, or they know different tricks that they would teach us….So that was a problem, and a lot of people experienced challenges when it came to assessments…there was a bit of a clash…because the lecturer will say no, I said this in my notes. Then you will say no, we were taught this in the department…*

According to Sapkaroski et al. (2020: 57), simulated clinical tutorials serve as a teaching tool that enables individuals to enhance their skill sets in an environment that imposes fewer time limitations and reduces the pressure associated with observation. Furthermore, simulated clinical tutorials offer multiple opportunities to engage with fundamental learning goals, thereby enhancing cognitive recall, while simultaneously fostering confidence in performing clinical tasks.

Alhasana et al. (2021: S69) highlight that while online material offers a convenient approach to learning, traditional methods of teaching such as face-to-face sessions, are more effective in conveying information to students. The absence of clinical tutorials, physical interactions, group discussions, and face-to-face attendance is believed to hinder the success of programme learning objectives. This was evident with the participants of the current study as they encountered challenges when trying to comprehend online video tutorials. Participants expressed a preference for face-to-face clinical tutorials, as they had experienced before the pandemic since the personal interaction facilitated their learning process.

Tay et al. (2021: 4) stress that the age disparity between most of the COVID-19 cohort of radiography students (Generation Z) and many clinical staff (Baby Boomer/Generation X and Millennial) accounts for the variation in medical education and teachings. The lack of clinical tutorials from HE educators impacted the clinical training of participants. Participants were exposed to older techniques and methods from senior, more mature radiographers that did not coincide with the amended methods and teachings from the current academic curriculum. This became problematic during assessments, as students demonstrated these different techniques, which were not accepted.

3.3.2.4 Category 2.4: Difficulty completing logbooks

A study participant detailed how the diminished patient volume in hospitals affected their ability to meet logbook requirements as these logbooks had been established prior to the pandemic. The decline in elective cases coupled with the reduced influx of non-urgent patients, limited student interactions with patients and the logging of necessary cases. As a result, stress levels among participants increased. While only one participant in this study raised this issue, it remains a significant concern for numerous students globally.

> FG4, P16: *…patients were very few…I didn't get enough exposure…especially in terms of logbooks, like the amount of procedures they wanted us to complete. Because that logbook was just set based pre-pandemic…and now we had to get some procedures done, which were unavailable during the pandemic period…*

> FG4, P16: *…it stresses us out now you see. All of these projections that you get, and you not getting anything at all. So the student – you panic, and you know you can't go forth with so many projections…*

Amidst the COVID-19 pandemic, there was a decline in the volume of non-essential medical examinations seen in some departments and hospitals (Teo et al., 2020: 359). O'Connor et al. (2023: 379) explain that certain imaging procedures became less frequent due to the limitations placed on non-urgent healthcare services. This reduction presented challenges for the skills development of radiography students as it influenced both their placement experience and the practical aspects of their learning (O'Connor et al., 2023: 379; Hinds & Lockwood, 2023: 196). Tay et al. (2020: 562) reveal that the learning objectives for radiography students in Singapore underwent adjustments during the COVID-19 pandemic. This was necessitated by the restricted number and types of examinations available to these students. Moreover, due to safety considerations, students could not be placed in high-risk areas, leading to limitations in their exposure to specific cases. Consequently, these students had less hands-on experience and encountered fewer noteworthy examinations of interest (Teo et al., 2020: 359). The current study participants were unable to fulfil the mandatory examination requirements for their logbooks due to the decreased patient volume and examinations at hospitals.

3.3.3. Theme 3: Enablers of effective clinical training

This theme centres on the favourable experiences that participants had during their WPL. These positive lived experiences played a crucial role in assisting participants in managing the challenging and ever-changing environment of WPL amid the COVID-19 pandemic. The effective communication from their educators, the positive attitudes of the participants, and the support provided by clinical staff, collectively contributed to helping participants navigate through their clinical training. In this theme, it is essential to discern between the types of

feedback discussed. Both the feedback received from participants and the way in which participants responded or reacted to feedback are being referred to.

3.3.3.1 Category 3.1: Effective communication with educators

The study participants emphasise the importance of good communication with educators during clinical training. They expressed feeling comfortable discussing their health concerns and experiences with their educators. Educators provided valuable advice during challenging situations and were considerate of logbook requirements. Participants viewed their educators as accommodating and supportive.

> FG 1; P7*: …whenever we felt sick, and…our mind just went to Covid, we could like easily just email our lecturers and tell them that we don't feel comfortable going to the hospital. Then they will be okay with it, or let us know okay, it's fine, you can isolate. And then if you feel okay, you can just come back. It's fine….*
>
> FG 4; P16: *… I think the lecturers were considerate in a way that it wasn't totally compulsory to get all of the views (logbooks)…the numbers were cut down. So whatever exposure we could get…that was acceptable, but within a range of how much time we spent in the hospital. Because we even went into the next year trying to finish up or spending more time in the Clinical Department...The lecturers were… understanding that some procedures, it was really hard to get them, based on the patient capacity…*
>
> FG2; P2*: So last year we had like interviews with our level coordinator…we decided, okay, we are going to tell her all about the experience that we are having in the clinicals now…we did tell her…She was supportive, and she did try to like give us advice how to handle…*
>
> FG2; P4: *…after that interview things got better at Hospital X, for me especially. I'm not sure if she did have a meeting with them or with the staff, but things got better. I wasn't getting the same comments anymore. I think the staff got – they understood better.*

Asrar et al. (2018: 33-34) emphasise that effective communication serves as a motivating force for students to excel in their studies. Effective communication cultivates comfort and positivity, ultimately leading to improved academic outcomes. Hence, it is crucial for educators to establish positive relationships with students and refine their communication abilities to contribute to a conducive learning environment for students (Asrar et al., 2018: 33-34). There was open communication between educators and the participants of this study, as the participants felt comfortable enough with their educators to communicate with them when they

were unwell to attend their clinical training. Participants also viewed their educators as considerate and understanding, as provision was made for the number of required logbook examinations when students explained their difficulty in completing their logbooks. Educators made alternate arrangements for participants to complete their logbooks going into the next year of study. This arrangement ensured that students still had valuable clinical exposure while eliminating undue pressure on them amid the pandemic.

According to Smith et al. (2015: 214-217), feedback plays a crucial role in facilitating a two-way communication opportunity that enables meaningful conversations. This form of feedback provides valuable information and as a result, action can be taken to address situations. In this study, participants utilised their mid-year interviews to engage in communication with their lecturers, providing them with feedback regarding their WPL encounters. This feedback provided by the participants to their educators influenced WPL training, as participants noted a positive change in their clinical environment.

3.3.3.2 Category 3.2: Positive student attitudes

The study participants emphasise that maintaining a positive outlook while working during the COVID-19 pandemic improved their clinical experience. Past experiences with other disease outbreaks influenced the way in which the COVID-19 pandemic was approached. Contentment regarding participants' career choices emerged as they recognised the essential role of radiographers in healthcare. The participants also appreciated constructive criticism of their clinical work received from clinical staff, as it motivated them towards achieving success in their radiography careers.

> FG4; P14: *…we had an Ebola outbreak a few years ago…I was in primary school…So at that time we were taught how to like wash your hands before and after, and don't be too close to your friends, and like ask how your friend is doing, what are they feeling like, what's going on, things like that we were taught…But with Covid…emotionally speaking I wasn't really affected, because I knew, okay, it's going to be fine….we're going to be all right and stuff. I just had to keep that positive mind.*

> FG2; P1: *I was actually happy, because I knew that I was in a field that would always be essential. So I would always have a job as well. So if another pandemic does occur, that…I am safe jobwise or career-wise at least.*

> FG 2; P1: *…I changed my wording of… When they had asked me to do a repeat, I would ask him what do you want to see better and how can I improve it. And then via that, by doing so it actually got better as well.*

Blanco and Lourenco (2022: 1) define optimism as a personality trait that indicates the degree to which individuals maintain positive expectations for their future. Optimism tends to decrease stress levels and enhance both physical health and overall well-being. Kamalrathne et al. (2023: 1) stress the need for effective epidemic and pandemic preparedness. Previous pandemics such as Ebola, SARS and Influenza, have inferred pandemic preparedness to be a core pillar of pandemic risk reduction. However, Weiner et al. (2020: 1789, 1796) indicated that countries with a history of outbreaks of infectious diseases were not better equipped to respond to COVID-19. Even individuals with prior experience in managing outbreaks did not exhibit enhanced readiness for the COVID-19 pandemic. This insight from Weiner et al. (2020) was derived from a global survey conducted among spinal surgeons, gauging their preparedness for COVID-19 with and without prior public health outbreak experience. Interestingly, a participant who had previously faced the Ebola outbreak in their home country expressed a high level of optimism when confronting the COVID-19 pandemic. This individual attributed their resilience during the pandemic to both past experiences and a positive mindset.

The COVID-19 pandemic has accentuated the crucial contribution made by radiographers within the frontline healthcare workforce. These HCWs faced challenging decisions to manage this crisis. Radiography examinations hold substantial importance in the care of COVID-19 patients (McNulty, 2020: 384-385). Participants in this study acknowledged and expressed contentment with their career selection in Radiography, recognising it as an essential service during pandemics. They also noted the field's reliable employability during crises, setting it apart from other professions.

Fong et al. (2016: 393) describe feedback as a powerful learning tool that plays a vital role in the teaching and learning process. Fowler and Wilford (2015: e23) add that students seek feedback that is precise and will clearly identify areas for improvement. They reflect on this received feedback and self-assess their performance indicating the development of autonomous competence. The way in which students receive and respond or react to feedback is vital as it improves their learning outcomes. Participants of this study responded positively to the received feedback, successfully integrating it to enhance their clinical skills.

3.3.3.3 Category 3.3: Supportive staff

The study participants shed light on the ways in which clinical staff played a crucial role in encouraging them through the challenges of the COVID-19 pandemic. The staff's support, patience, and understanding of the participants' difficulties, such as missing clinical time during the lockdown, proved instrumental in helping them regain confidence in their WPL experiences.

> FG 1; P5: *I personally felt like the staff were actually being lenient with us, …So at times I would feel like, okay, are they undermining my intelligence, but then you*

remind yourself, no, they actually trying to be considerate because they understand the situation. So as frustrating as sometimes that could be for us when they ask us, "can you even do a chest X-ray", it's because they genuinely want to know if you are okay, like do you need assistance. It's not coming out of a place of harshness, but out of a place of trying to assist, due to the circumstances.

FG4; P14: *…So it was nice, because they (clinical staff) really helped us, and we even had a tutorial with one of the chiefs in the department. And I think from that point, that is where we kind of felt confident, okay, we can do these things…*

FG4; P15: *…the staff were understanding…because they knew that we were not here most of the time.*

Fowler and Wilford (2015: e16) and Young et al. (2023: 291) agree that WPL experience is critical in providing the necessary education needed to develop competent graduates in diagnostic radiography. In addition, Fowler and Wilford (2015: e16) state that student radiographers receive guidance and mentorship in a complex environment from radiographers and other healthcare experts who play a key role in strengthening the learning process within clinical practice. Young et al. (2023: 292) stress that an environment that fosters support contributes positively to student learning. Certain participants in this study found the staff to be supportive and helpful when they resumed their WPL. Some staff showed consideration for the repercussions of missed clinical exposure and demonstrated an understanding of the additional attention and needs of the participants. Senior radiographers in the clinical departments offered tutorials to enhance participants' comprehension of techniques and examinations. Despite potential discrepancies in the techniques taught (refer to Category 2.3: Lack of clinical tutorials), these senior radiographers made a concerted effort to support students and clarify the examinations for better understanding.

3.3.4 Theme 4: Coping mechanisms

This theme focuses on the different ways in which the participants coped during the COVID-19 pandemic to maintain their mental and emotional well-being. During the COVID-19 pandemic, the participants faced numerous challenges and increased stress due to the demanding and uncertain healthcare environment they encountered. Participants had to adapt to new protocols, safety measures, and the potential risk of exposure to the virus while continuing their essential clinical training. Support from family, peers and educators helped participants through this difficult and unprecedented time. The below verbatim quotations express some of the statements of the participants.

3.3.4.1 Category 4.1: Family and peer support

The participants conveyed the pivotal role of family support in coping with the challenges of the COVID-19 pandemic. Their families encouraged them to approach each day as it came and motivated them to persevere. The participants also expressed how their peers worked together and supported each other. Their peers were faced with the same situation and could therefore understand and relate to each other in ways others could not.

> FG4; P14: *…my family played a big part, because they were like okay, life is a learning process. So sometimes it's good, sometimes it's bad. Like you just have to take it one step at a time…If today I didn't do well, tomorrow I can do better…*
>
> FG 2; P1: *…I wasn't so hard on myself, and I seek support from friends and family… that helped me a lot to gain more experience and to just keep trying.*
>
> FG 4; P14*: At work it was more my friends, like us as a class. I think we became closer also as a class, because we understood, okay, we don't know a lot, but let us learn together…Let me show you how to do a shoulder, and you show me how to do an elbow...all together we were learning.*

Rachele et al. (2020: 3) state that the kind of support an individual obtains can have a different impact on one's stress reduction. However, support gained from friends and family, specifically during the COVID-19 pandemic, has helped individuals share their feelings and feel belonging.

A study conducted by Li et al. (2021: 1952) on health professional students in China suggests that there was a high prevalence of COVID-19-related stress among students. It was concluded that during unprecedented times, family and professional support should be extended to help vulnerable individuals. Luu (2021: 2) highlights that in certain cultures, family is considered a primary source of support since family members tend to share experiences and offer one another support when faced with a difficult situation. The participants of this study felt that their family support provided them with valuable emotional care, practical guidance, and a positive mindset that allowed them to navigate the difficulties they faced as student healthcare professionals.

A study conducted by Naylor et al. (2021: 190, 191) on radiographers in the United Kingdom working during the COVID-19 pandemic, determined that peer support from colleagues within the workplace is a crucial element in coping effectively. High morale, camaraderie and team spirit were some of the benefits radiographers in this study reported. Agarwal et al. (2020: 57) state that peer support in the workplace bolsters psychological resilience by enhancing coping skills and offering social support. Participants shared that support from their peers helped them cope and persevere in a stressful environment.

Jadzinski et al. (2019) state that peer learning is recognised as a successful learning strategy that supports the development of health professionals. A review article by Markowski et al. (2021: 1520) adds that peer learning includes peer support and feedback, which aids in building competence and confidence while reducing stress and anxiety. Peers can serve as role models to improve clinical knowledge and peer support helps alleviate difficulties faced in clinical practice. The importance of peer learning was clearly articulated by the participants of this study as they helped each other navigate through their learning difficulties.

3.3.4.3 Category 4.3: Educator Support

The participants expressed gratitude for the various methods of support they received from their educators. They also appreciated the availability of supplementary tutorials that were provided.

> FG 3; P10: *I feel like the lecturing staff really took care of us. Because if they didn't, I feel like they would send us to go and handle the COVID patients.*

> FG 4; P15: *They sent us messages from time to time. And their doors were always open, which they said in the messages. If we ever needed to speak to them…we would see lecturers from time to time…they would come and check up on us - how are we doing? how is everything?...*

> FG 3; P9: *Doctor X even offered us return tutorials.*

The concept of an open-door policy symbolically signifies a leader's willingness to be readily available to anyone seeking conversation (Loisulie, 2019: 165; Afridah & Lubis, 2024: 7). Open-door policies aim to foster an environment of openness and transparency (Loisulie, 2019: 165). Afridah and Lubis (2024: 4) emphasise that openness and transparency enable individuals to express their ideas, apprehensions, and experiences, creating an environment where one feels heard and valued. In this study, participants observed that their educators showed care by conducting in-person check-ins and affirming their commitment to an open-door policy. They felt recognised, listened to, and well cared for.

According to research conducted by Shahsavari et al. (2017: 151), undergraduate nursing students who engaged in a clinical skills refresher course experienced reduced anxiety levels, increased clinical self-efficacy, and improved clinical skills. This refresher course facilitated a seamless transition from theoretical knowledge to practical application (Shahsavari et al., 2017: 151). Likewise, participants in this study appreciated the chance to attend return tutorials, finding them beneficial in bridging the gap between theory and practice, and preparing them for WPL.

3.4 Conclusion

Within this chapter, we delved into the diverse themes and categories that surfaced from the collected data. The findings of this study were contextualised through a literature review. Notably, this research brings attention to the many emotions experienced by diagnostic radiography students amidst the COVID-19 pandemic. The developed themes portray the challenges and positive experiences encountered by students. The coping mechanisms employed are also thoroughly discussed. Drawing from the researcher's understanding of the lived experiences of these participants, the subsequent chapter outlines guidelines and recommendations that can be applied when students are faced with another pandemic.

CHAPTER 4

GUIDELINES, RECOMMENDATIONS, AND CONCLUSION

4.1 Introduction

In this chapter, guidelines and recommendations associated with the identified themes from Chapter 3 are provided. These guidelines and recommendations can be used by educators to better support students during pandemics. The proposed guidelines and recommendations aim to enhance clinical training, hence Theme 3: Enablers of effective clinical training, was excluded. While acknowledging that Theme 4: Coping mechanisms does indeed improve clinical training, recommendations for other coping strategies are suggested. The chapter ends with a reflection and conclusion. A summary of the proposed guidelines formulated for specific themes is presented in Table 4.1 below.

Table 4.1: Themes and guidelines

Themes	Guidelines
Perspective towards workplace learning (WPL)	Guideline 1: Facilitation of an induction programme to ease students' transition into workplace learning: • Psychological support • In-person PPE demonstrations • "What to expect" workshop
Barriers to effective clinical training	Guideline 2: Promotion of effective communication among stakeholders: • Multi-stakeholder collaborative meetings • Quarterly updates • Investment in VR system
Coping Mechanisms	Guideline 3: Provision of support mechanisms to enhance student wellbeing: • Extra-curricular activities • Rejuvenation room and tea garden • Reflective practice

4.2 Theme 1: Perspectives towards workplace learning

4.2.1 Guideline 1: Facilitation of an induction programme to ease students' transition into workplace learning

The first theme explored the perspectives of radiography students concerning WPL during the COVID-19 pandemic. Participants shared their experiences in adjusting to the "new" clinical environment. During this unprecedented time, individuals experienced a sense of unpreparedness, encountered challenges, and grappled with mixed emotions. The impact of the COVID-19 pandemic extended beyond the clinical environment, affecting participants' personal lives and leaving them feeling vulnerable and stressed. Despite these challenges, participants persevered and were resilient, eventually adapting to the new clinical environment. This theme shows that there is a need to help students become better prepared for changes in the clinical environment. Therefore, the researcher proposes the facilitation of induction of students into WPL to allow radiography students to be more prepared when entering the clinical environment. Mchete and Shayo (2020: 285, 288) explain that induction training plays a crucial role in acquainting individuals with essential aspects of a new working environment. A well-executed induction training programme enables individuals to familiarise themselves with certain departments' procedures, policies and protocols. This induction programme can be conducted annually to serve as a refresher for students. Suggestions to achieve this guideline are included below:

4.2.1.1 Psychological support

As indicated in the previous chapter, when entering the "new" clinical environment, radiography students experienced an array of emotions. While a few radiography students had positive experiences, most of these students encountered difficulties and felt a sense of being overwhelmed. These students also felt isolated and had a fear of being infected or infecting their loved ones which impacted their personal lives.

The global impact of the COVID-19 pandemic has given rise to an unprecedented mental health crisis (Karekla et al., 2021: 12). Cabarkapa et al. (2020: 1-2) underscore that frontline HCWs are particularly vulnerable to these mental health challenges due to the elevated infection risk, heightened job-related stress, and the fear of transmitting the virus to their families. Anxiety, burnout, depression and post-traumatic stress were common symptoms reported by HCWs. Furthermore, Fukuti et al. (2021: 2) indicate the incidence of psychiatric symptoms and emotional distress were higher among HCWs than among the general public during the COVID-19 pandemic. Therefore, it is imperative to ensure that HCWs have convenient access to mental health support as a protective measure. Karekla et al. (2021: 14) affirm that psychologists, as experts in behaviour modification, can play a significant role in addressing the repercussions of pandemics.

Based on the data collected, it became apparent that despite the presence of university counsellors, students did not fully utilise this resource due to inadequate communication regarding its availability. The researcher acknowledges the importance of raising awareness about the services provided by dedicated psychologists. As part of the induction programme, it is recommended that the university's psychologist deliver a presentation to students, emphasising possible signs of mental health issues together with the significance of seeking support from the available university psychologist and counsellors. The various means of contact and the range of services offered should be highlighted. Additionally, it is recommended that WIL facilitators regularly send electronic notifications to students about the availability of psychology services, to serve as reminders that help is readily accessible. It is hoped that following these interventions, students feel more comfortable seeking help when needed.

4.2.1.2 In-person PPE demonstrations

As revealed by the data analysed in Chapter 3, radiography students expressed a lack of confidence in their training and preparedness when commencing WPL during the COVID-19 pandemic. Specifically, concern was raised relating to students' proficiency in the proper use of PPE. As noted by Mutch et al. (2023: 2), after this pandemic, there was an increased focus on pandemic preparedness, due to numerous mistakes in the procedure for donning and doffing PPE for High Consequence Infectious Diseases (HCIDs) being attributed to HCWs not following the correct steps. Additionally, Mutch et al. (2023: 2) emphasise the importance of comprehensive PPE training for HCWs and their ability to retain these competencies post-training.

The researcher acknowledges the importance of providing effective PPE training to ensure that student radiographers feel safe and are well-prepared to use PPE correctly during pandemics. As part of the induction programme, it is recommended that not only video demonstrations are presented to students, but that dedicated time be set aside for hands-on, small-group practical demonstrations. According to Ferris et al. (2016, 3-4), small-group demonstrations encourage interactive and thorough comprehension of subject matter by involving students in active discussions and critical thinking. This active engagement facilitates the expansion of knowledge and enhances clinical productivity. If these in-person/ hands-on demonstrations are conducted regularly, it will avoid panic and fear of future pandemics. This can be seen as a proactive approach to assisting students to be better prepared for the realities of their work environment.

4.2.1.3 "What to expect" workshop

Su et al. (2023: 1) note that healthcare professionals, as frontline workers, frequently operate at the epicentre of disasters. Education and training initiatives encompassing a well-organised, methodical and comprehensive understanding of and readiness for threats associated with disasters can significantly enhance the preparedness of healthcare professionals for such occurrences (Su et al., 2023: 2). According to Tanner and Hale (2002: 47), workshops are identified as a strategy suitable for disseminating information.

As part of the induction programme, this workshop would serve the purpose of pinpointing and communicating crucial details to radiography students regarding what they can expect during their WPL experience. Clinical instructors, lecturers and hospital staff will be the individuals entrusted with providing the pertinent and essential information necessary to enhance the preparedness of radiography students as they enter the clinical environment. Clinical instructors and lecturers can focus on disseminating information regarding logbook requirements, missed clinical days (due to pandemic reasons), clinical tutorials and assessments, amongst other topics. In addition, they should highlight past pandemics such as SARS and COVID-19 and its effects on allied health students. Hospital staff will be tasked with explaining the changes that occur within the clinical environment during pandemics and detailing pandemic protocols aimed at keeping all hospital staff and patients safe. During this workshop session, radiographers and students can share their experiences as a form of motivation for new and upcoming radiography students. While these workshops are targeted at pandemic preparedness, similar workshops can be conducted every year to ensure students are familiar with the current practices of each clinical institution.

4.3 Theme 2: Barriers to effective clinical training

4.3.1 Guideline 2: Promotion of effective communication among stakeholders

Theme 2 was developed after participants expressed how the COVID-19 pandemic inhibited their clinical training. Participants missed almost an entire year of clinical exposure and upon their return, were faced with many challenges as they lacked the confidence and knowledge required for their year level. Precautionary measures taken to reduce the number of patients in the hospitals directly impacted the participants' ability to log their required examinations. This affected their clinical exposure to certain examinations. Participants experienced adverse emotions and a sense of inadequacy triggered by feedback received from radiographers in the clinical departments. The lack of face-to-face clinical tutorials from educators, coupled with discrepancies in radiographic techniques affected the participants' clinical training.

According to Eke (2020: 42-43), successful operations in dynamic environments require effective communication. Communication serves as a crucial tool that individuals within an

organisation utilise to comprehend and attain set objectives. While an organisation may possess all the essential resources for seamless operations, the absence of a well-established communication process can impede efficient functioning and success (Eke, 2020: 42-43). Recognising the importance of fostering effective communication among the various stakeholders i.e., students, HE academics, and clinical partners; the researcher deemed it necessary to create this guideline. This guideline aims to cultivate and strengthen connections between the stakeholders, encouraging transparency, positivity, and ultimately enhancing academic outcomes.

4.3.1.1 Multi-stakeholder collaborative meetings

MacDonald et al. (2018: 409) explain that comprehending and addressing complex, multi-faceted concerns pose a challenge for individual organisations. Hence, there is a need to collaborate, bringing together the knowledge and resources of multiple stakeholders to facilitate joint action across sectors.

From the data collected, it is apparent that there is a communication barrier that exists between the various stakeholders. The researcher acknowledges this disconnect and proposes the implementation of collaborative meetings between the stakeholders. It is crucial to emphasise that these meetings should be treated as a "safe space", where individual stakeholders feel free to respectfully express themselves without fear of victimisation. These meetings can take on different forms, serving as a forum that can be used:

- To express concerns from different stakeholders.
- To promote "radiographer awareness" regarding student experiences during WPL.
- Emotional intelligence (EQ) focused training can be incorporated into these meetings to help radiographers be more empathetic or mindful in their approach towards students.
- To discuss students' levels of knowledge, including procedures covered in specific year levels and the expected timelines for acquiring certain skills.
- To conduct "information sessions" with clinical staff to update them on new and modern adaptations to radiographic techniques.
- For academics to receive feedback from clinical staff regarding student needs and areas of difficulty. Clinical staff can provide specific guidance on aspects that academics should focus on.
- To provide students with a platform to voice their opinion on programme

shortcomings.

This guideline aims to facilitate collaboration among stakeholders, working together towards the common goal of improving the BSc: Radiography programme. The objective is to make a positive contribution to the radiography profession by producing competent and well-informed radiographers.

4.3.1.2 Quarterly updates

A digital communication system will be used to administer quarterly updates to stakeholders. Han et al. (2024: 3) describes digital communication as the exchange of information via electronic devices. This mode of communication has become progressively popular as technology has made it simpler to share information and connect with others. Utilising digital tools to communicate, collaborate, and access information enables individuals to enhance their efficiency, effectiveness, and productivity, thereby contributing to improved organisational outcomes (Vercic et al., 2023: 2).

For this guideline, content facilitated by HE academics, can be revised and posted on SharePoint every quarter. Stakeholders can receive an email containing a link to SharePoint for easy access. Noteworthy updates, including new and modern adaptations in positioning techniques, image evaluations, revised abbreviations and mnemonics, recent developments in HE, and updates from clinical departments, can be communicated. Additionally, this digital platform can serve as a creative outlet for stakeholders. Users may share poems, short stories, creative content or engage in mind-enhancing activities like crossword puzzles, sudoku, or quick "work-friendly" mind and body exercises to add an interactive dimension to this digital space. Fostering a dynamic exchange of information and creativity through SharePoint creates a more engaged and informed community within the HE and clinical environment. The quarterly updates and diverse content not only enhance communication among stakeholders but also provide an avenue for expression and mental stimulation. This collaborative digital space is poised to cultivate a sense of connection, knowledge-sharing, and well-being among stakeholders contributing to an enriched and vibrant educational and clinical community.

4.3.1.3 Investment in Virtual Reality systems

The use of virtual reality (VR) systems in radiology education has shown to be advantageous to students as it encourages a greater level of active learner participation (Means et al., 2023: 20). Sapkaroski et al. (2020: 57) elaborate that VR systems enable students to hone skills in radiographic positioning, image acquisition, post-processing, and image interpretation. Means et al. (2023: 20) further note that some academic centres have even used VR technology to simulate adverse reactions to contrast media. Key benefits of VR systems include providing students with an environment free from time constraints, reducing perceived observational

pressure, and offering repeat exposure to essential learning objectives, thereby enhancing cognitive recall and building confidence in clinical tasks (Means et al., 2023: 20). O'Connor et al. (2023: 440) assert that during times of reduced clinical exposure, VR systems can assist the training of radiography students as during the COVID-19 pandemic radiography students in Ireland have relied on simulation-based learning to develop their clinical skills. Bangalee and Bangalee (2022: 45) propose that amid a pandemic, specific assessments be relocated to a safer, less risky settings, such as simulation-based activities. Investing in VR systems has numerous benefits to student training, especially in situations of limited clinical exposure. Tailored tutorials, simulations and assessments can be created to meet the specific requirements of students at different levels.

4.4 Theme 4: Coping mechanisms

4.4.1 Guideline 3: Provision of support mechanisms to enhance student wellbeing

Theme 4 delved into the diverse coping mechanisms employed by participants during their WIL experience. The support of family, peers, and educators proved instrumental in helping participants manage the challenges posed by the stress of the COVID-19 pandemic. Despite participants effectively managing these challenges, the following additional coping mechanisms have been recognised to further support students in future pandemics:

4.4.1.1 Extra-curricular activities

The mental wellbeing of university students has been severely impacted with the stresses of the COVID-19 pandemic (Nair et al., 2023: 209). Finnerty et al. (2021: 2) points out that participating in in extra-curricular activities is associated with increased well-being; contributing to the facilitation of problem solving, enabling expression of emotion, enhancing adaptability and development of interpersonal skills. Some extra-curricular activities that have been documented to be beneficial to individuals' well-being during pandemics include outdoor exercise, virtual socialising, listening to music, watching movies and series, and engaging in social media. Students should be encouraged to engage in extracurricular activities that can assist in alleviating stress and fostering a positive mindset.

4.4.1.2 Rejuvenation room and tea garden

Labib et al. (2022: 1) and Ningtyas et al. (2023: 543) concur that exposure to natural environments positively affects an individual's mental health and well-being. Increased contact with nature is associated with reduced levels of depression, loneliness, stress, and anxiety (Labib et al., 2022: 13). The calming presence of natural landscapes, the gentle sounds of flowing water, and the radiant colors of nature all promote a sense of tranquillity and rejuvenation (Ningtyas et al., 2023: 544). Furthermore, Ningtyas et al. (2023: 543) emphasise that the COVID-19 pandemic has highlighted the benefit of having urban green and blue

spaces within city spaces on the mental health of individuals. In this study, it is recommended that students be assigned a specific space within the clinical environment that opens to a tea garden. This designated area can be transformed into a rejuvenation room, featuring a serene, natural ambiance to encourage calmness and relaxation. The room can serve as a retreat for students, allowing them to take a "time-out" to recover and release negative feelings. Additionally, the tea garden can be utilised as a peaceful space for students to unwind during their breaks. This recommendation is hoped to contribute positively to the students' educational journey.

4.4.1.3 Reflective practice

Karera et al. (2023: 950) and Ambady (2018: 2) articulate that reflective practice involves a comprehensive evaluation of an individual's past experiences, aimed at understanding and improving future professional practice. For healthcare professionals, engaging in reflective practice, augments their ability to reason effectively when confronted with intricate clinical situations. Reflective practice can manifest in various forms i.e., face-to-face methods, such as one-to-one or small group discussions as well as written methods such as diaries, portfolios and journals (Karera et al., 2023: 950). The promotion of diverse reflective practices should be encouraged amongst students. Written reflective methods can empower students to engage in self-reflection and enhance their professional practices (Karera et al., 2023: 951). Specific time slots in the academic timetable should be dedicated to group discussions. These discussions can be scheduled for the first Monday following a clinical rotation, providing students with the opportunity to promptly share their experiences. This facilitates constructive criticism in a supportive environment, enabling students to learn from each other's experiences (Al-Bashir et al., 2016: 28-39).

4.5 Recommendations

4.5.1 Recommendations for clinical practice

- **EQ training:** Implement EQ training for clinical radiographers to enhance their understanding and empathy towards student training.
- **Stakeholder collaboration:** Schedule regular meetings among stakeholders to collaboratively improve clinical training.
- **Preparedness training**: Offer appropriate training for all stakeholders to effectively handle unprecedented events such as future pandemics, natural disasters, and mass casualty incidents. In this way qualified radiographers can provide better guidance and support to students in these events.
- **Inclusive roster planning:** Involve students in the planning of rosters to ensure they

gain exposure to areas where they need more experience.

- **Academic staff support:** Ensure academic staff are more supportive and visible during WPL, working closely with students to demonstrate correct techniques.
- **Adapted logbooks:** Modified logbooks to address pandemic-related challenges and patient availability, with clear adjustments and requirements conveyed to students.
- **Promotion of psychology services:** Active promotion of the availability of psychology services to support students.

4.5.2 Recommendations for radiography education

- **Virtual reality (VR) systems:** Invest in VR systems to provide continuous and immersive clinical training.
- **Updates on examination techniques:** Regularly share updated examination techniques with clinical partners to ensure students learn the most current methods.
- **Curriculum alignment:** Hold regular meetings with clinical partners to align the academic curriculum with clinical practice, bridging the theory-practical gap.
- **Student resilience training:** Incorporate resilience-building activities and training into the curriculum to help students develop effective coping strategies and adaptability in the face of challenges.
- **Student debriefing sessions:** Conduct regular debriefing sessions during academic blocks, providing students with an outlet to share experiences following clinical rotations.

4.5.3 Recommendations for radiography research

- **Develop a support model for educators:** Pursuit of a doctoral qualification by creating a comprehensive support model for educators to assist radiography students during pandemics.
- **Expand cohort size:** Extend the current research study to include a larger cohort of diagnostic radiography students from various levels of the BSc: Radiography programme who had experiences related to WPL during the COVID-19 pandemic.
- **Include all radiography disciplines:** Conduct a study that encompasses all disciplines within the BSc: Radiography programme (diagnostic ultrasound, radiation therapy, and nuclear medicine technology) to gather broader data on student experiences with WPL during pandemics.

4.6 Study limitations

- **Study participants:** The study was limited to only the 4th-year 2022 cohort of diagnostic radiography students in the Western Cape. The study excluded all other diagnostic student levels and other disciplines within the BSc: Radiography programme who also experienced WPL during the pandemic.

- **Timing of ethical approval:** Ethical approval was obtained late in 2021, which excluded the opportunity to sample the 2021 4th-year diagnostic radiography students. This group also experienced uninterrupted WPL during 2021 but had already exited the BSc programme by the end of the 2021 academic year.

4.7 Conclusion

Since the onset of the COVID-19 pandemic, the radiography profession has undergone change. This unprecedented global pandemic has compelled HEIs to adapt their teaching methods and employ diverse approaches to learning. The purpose of this descriptive phenomenological study was to explore and describe the lived experiences of diagnostic radiography students within the Western Cape. The participants of this study shared their experiences. Categories and themes erupted from the collected data. Perspectives towards WPL, barriers to effective clinical training, enablers of effective clinical training and coping mechanisms were the four main themes identified. From the researchers' understanding and literature control of these themes and categories, recommendations and guidelines that can assist educators in providing better support to students during pandemics were formulated. It is the aspiration of this study that these recommendations and guidelines will improve teaching and learning experiences for students confronted with pandemics. It is worth noting that some of the guidelines and recommendations formulated for this research study can also be applied to non-pandemic situations to enhance the BSc: Radiography programme.

4.8 Personal reflection

My experience as a diagnostic radiographer working during the COVID-19 pandemic inspired me to pursue this research topic. The precautious and mental mindset needed to navigate the challenges of the pandemic took a toll on me. Particularly with regards to the fear of transmitting the virus to my family, and the need for isolation. At the time, my son was just four years old, and could not fully understand why “mommy didn’t not want to be near him”. That was heartbreaking for me. I imagined that students working through the pandemic faced similar struggles, which motivated me to explore their challenges.

Pursuing this Master’s qualification was an immensely challenging journey. Balancing home life, motherhood, work, and studies proved to be quite demanding. For me, this journey was too long. I just wanted it to be over! Finding time in the busyness of life was particularly difficult.

The motivation and advice I received from my supervisors, along with the encouragement from my family, kept me going.

Despite the challenges, this research journey has been incredibly enriching. I have developed patience, honed my listening skills, and gained a great deal of knowledge about research processes and scientific writing. Engaging in this research has not only enhanced my professional capabilities but also made me a better individual. My vocabulary, communication skills, and ability to engage with people have all improved. Listening to the lived experiences of students has provided me with a new perspective, opening my eyes to the challenges faced by students we interact with every day. These experiences and the invaluable knowledge gained, have positively influenced my daily work as a clinical instructor.

As I approach the end of this journey, I look forward to putting my feet up, enjoying full nights of sleep, and some quality family time!

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APPENDICES

APPENDIX A: RESEARCH STUDY INFORMATION LETTER

Title of Study: The lived experiences of diagnostic radiography students undertaking workplace learning during the covid-19 pandemic.

Researcher: Ramona Moodley

Dear Student

I, Ramona Moodley, would like to invite you to participate in the above titled research study. This study is a research project required for the completion of a Master of Science (MSc) Degree in Radiography done though the Cape Peninsula University of Technology (CPUT).

The aim of this study is to explore and describe the lived experiences of BSc 4th-year diagnostic radiography students working during the COVID-19 pandemic. Based on this understanding, recommendations will be developed for educators to better support and guide students working during the current COVID-19 and future pandemics. Results of this study will be published in order to contribute to the body of knowledge in radiography education.

Participation in the study is completely voluntary and open to all BSc 4th-year diagnostic radiography students. Students should not feel pressured into participation as your involvement in this study will not affect your position in the BSc programme. If you are willing to participate, you will be asked to sign an informed consent form for participation and for audio (face-to-face interview) or video (virtual interview) recordings. These informed voluntary consent forms can be submitted face-to-face or via electronic communication, depending on your preference.

You will be asked to share your experiences of working during the COVID-19 pandemic. Interviews will be conducted by myself and will be either face-to-face or virtual focus groups, depending on the COVID-19 lockdown level. If face-to-face, it will be conducted in a relaxed environment at the CPUT Nursing Boardroom. This venue was selected as it is away from your clinical department and lecture rooms. This will allow your identities to remain confidential from clinical staff and your lecturers, encouraging openness of your experiences. All COVID-19 protocols will be adhered to. Virtual focus group interviews will be via Microsoft Teams or Zoom platforms. These interviews will be conducted at mutually agreed upon times. Interviews will be audio or video recorded to allow sufficient time to accurately understand and analyse what was said during the interview. You will be requested to give consent for audio or video recording of the interviews on a separate request form. All efforts will be made to keep your identities anonymous. Your names will be replaced with pseudonyms when the recorded interviews are been transcribed. Students are urged to respect the privacy of all individuals by not discussing any information and conversations outside of the focus groups. Any person involved in this study will sign a confidentiality agreement. You will be given feedback via email,

allowing you the opportunity to comment on the accuracy of the analysed data.

Your participation is completely voluntary. However, if you decide to withdraw from the study, you may do so without reason and without judgment. I humbly request that you inform me as soon as possible if you wish to do so. Data collected until the time of withdrawal will be retained, as no names of participants will be used. Hence, I will not be able to identify the contribution made by any specific participant. In keeping with the protection of personal information act (POPI Act), all information gathered is strictly anonymous and confidential. All research data collected will be securely kept under password protection on cloud storage. Access to the research information will primarily be for the researcher. The research supervisors will only be allowed access when and if necessary. Any person involved in this study, and any person that requires access to this research data will be required to sign a confidentiality agreement.

There will be no incentives or financial gain to the study participants. However, it must be noted that your participation will provide a valuable insight and understanding of students working during the current pandemic. This insight will aid in providing adequate and appropriate support needed for diagnostic radiography students working during pandemics.

Since this study aims to understand your lived experiences, this study will not expose you to any physical harm. However, if you experience any emotional stress, you will be referred for counselling to CPUT's student counselling department.

The departments details are as follows:

During the day: Tel: 021 460 3237 / 021 959 6182 or email:

student-counselling@cput.ac.za or 24-hour emergency numbers: 0861 322 322 (Lifeline)

0800 567567 (Suicide Helpline) 063 709 2620 (Watsapp).

As the researcher of this study, I will be responsible for providing accurate and ethical scientific research which respects your human rights and your rights as a research participant.

Should you require further information or have any concerns about this research, its risks, or benefits, please feel free to communicate with me via email at moodleyr@cput.ac.za or my research supervisors Dr K Naidoo (Supervisor) via email at naidooka@cput.ac.za and Mrs H Thomas (Co-supervisor) via email at thomashe@cput.ac.za .

This study was reviewed and approved by the CPUT Research Ethics Committee to protect your interests**.** If you feel that any concerns, complaints, and questions regarding your study participation have not been appropriately dealt with, please contact the chairperson of the Faculty of Health Sciences Research Ethics Committee at CPUT, Dr D Bester via email at Besterd@cput.ac.za .

Thank you for taking the time to read and consider your participation in this study.

Yours sincerely,

R. Moodley

Mrs Ramona Moodley Date: January 2022

APPENDIX B: INFORMED CONSENT FORM FOR PARTICIPATION IN THE RESEARCH STUDY

The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic

Please initial each box if in agreement:

☐	I confirm that I have read and understood the information letter dated January 2022 for the above study and I understand why my participation is needed.
☐	I confirm that I was given the opportunity to contemplate this information, ask questions, and have had these questions answered to my satisfaction.
☐	I confirm that I was not coerced into participation and that my participation is completely voluntary.
☐	I understand that I am free to withdraw from this study at any time without giving a reason and this withdrawal will not affect my standing in the BSc: Diagnostic Radiography programme.
☐	I agree to participate in either the face-to-face or virtual focus group interview for the above study
☐	I agree to participate in a focus group interview and will respect the privacy of all individuals by not discussing any information outside of the focus group.
☐	I have read this consent form and have been given the opportunity to ask questions before signing.

Name of Participant	**Signature**	**Date**

Participant email	**Participant contact number**

Name of Researcher	**Signature**	**Date**

APPENDIX C: CONSENT FOR AUDIO AND VIDEO RECORDING OF INTERVIEWS

The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic

Please initial each box if in agreement:

☐ I hereby give consent for my interview to be audio recoded in the event of in- person interviews or video and audio recorded in the event of virtual interviews whilst participating in the above study.

☐ I understand that my personal information and identity details will be anonymised to protect my identity.

☐ I confirm that I have read this consent form and have been given the opportunity to ask questions before signing.

_____	_____	_____
Name of Participant	**Signature of Participant**	**Date**
_____	_____	_____
Name of Researcher	**Signature of Researcher**	**Date**

APPENDIX D: CONFIDENTIALITY AGREEMENT – PERSONNEL INVOLVED IN RESEARCH STUDY

The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic

I,_____hereby declare that I understand and agree that all information acquired in the conduction of the above research study is confidential and will not be discussed with any other persons outside the research study team.

_____	_____	_____
Name of Personnel	**Signature of Personnel**	**Date**
_____	_____	_____
Name of Researcher	**Signature of Researcher**	**Date**

APPENDIX E: CONFIDENTIALITY AGREEMENT -TRANSCRIBER

Confidentiality agreement -Transcriber

Cape Peninsula University of Technology

The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic

I, LIZ DE GRAAF hereby declare that I understand and agree to the following requirements with regards to the transcription of the audio or video recordings for the above study:

Please initial each box if in agreement:

X	I understand that the audio or video recordings are received for the purpose of transcribing interview records only.
X	I agree to treat all audio or video recorded tapes as confidential content to which I only will have access.
X	I will keep the audio or video recorded tapes and any relevant or copied material securely locked away.
X	I will return all research material back to the researcher on completion of the transcription.

LIZ DE GRAAF	Lizdegraaf	14-04-2022
Name of Transcriber	Signature of Transcriber	Date
Ramona Moodley	R Moodley	14/04/2022
Name of Researcher	Signature of Researcher	Date

APPENDIX F: REQUEST FOR RESEARCH PERMISSION TO HOD OF MITS DEPARTMENT

Request for research permission to HOD of MITS department

The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic

Dear Dr Merlisa Kemp

I, Ramona Moodley (researcher), request permission to conduct the above-mentioned research study within the Medical Imaging and Therapeutic Sciences (MITS) department on the BSc: Diagnostic Radiography 4th year students. This research study is required for the completion of my Master of Science (MSc) Degree in Radiography done though the Cape Peninsula University of Technology (CPUT).

This study aims to explore and understand the lived experiences of radiography students undertaking workplace learning during the COVID-19 pandemic. Based on this understanding, recommendations for educators to support students during the current and future pandemics will be developed.

Due to my position as researcher and clinical instructor within the MITS department and working with the 4th year students, an independent individual, who is not directly involved in the teaching of BSc 4th year diagnostic radiography students will recruit participants for this research study. This independent individual will distribute information letters and consent forms via email to all BSc 4th year diagnostic radiography students and collect the informed voluntary consent. This allows students freedom of choice and avoids any coercion into participation. These informed voluntary consent forms will be collected in-person or via electronic communication, depending on participant preference. Participation is completely voluntary. Data collection will be conducted my means of rapport in-person or virtual focus groups interviews, depending on the lockdown level. If in-person, it will be conducted in a relaxed environment at the CPUT Nursing Boardroom where all COVID-19 screening and protocols will be adhered. The Nursing Boardroom is situated away from the clinical environment and MITS lecture venues. This allows student identities to remain confidential

from clinical staff and lecturers and encourages openness of experiences. Virtual focus group interviews will be via Microsoft Teams or Zoom platforms. Interviews will take place at a time that is suitable to both the researcher and students. This schedule will not interfere with student academic and clinical time. Ethical principles and the protection of personal information act (POPI Act) will be closely followed to protect the dignity, rights and welfare of the research participants. No harm will be inflicted on these participants as the study aims to explore the experiences of this particular group of students. However, if emotional uncertainty is recognised, details for counselling at the CPUT student counselling department will be made available.

I have provided you with a copy of my research proposal with study details for your information. If you require further information, please do not hesitate to contact me on: Cell: 071 608 8701 or email: moodleyr@cput.ac.za

Thank you for your time and
consideration. Kind regards

R. Moodley

Mrs Ramona Moodley

Permission to conduct a research study in the Medical Imaging and Therapeutic Sciences (MITS) Department: Cape Peninsula University of Technology:

I, MERLISA KEMP hereby declare that I have read and understood the proposal on the research titled, **The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic,** and grant permission for the study to be conducted in the MITS Department at the Cape Peninsula University of Technology.

M Kemp

Signature of HOD

24/04/2022

Date

APPENDIX G: SAMPLE INTERVIEW QUESTIONS

The focus groups will be guided by the following open-ended neutral question:

1. Tell me about your experience of working during the COVID-19 pandemic?

Probing questions will be asked based on the experiences shared.

Possible follow-up questions could include:

2. How did you feel about being exposed to possible COVID-19 positive patients each day you are at clinicals?
3. What were some of the emotions you experienced?
4. Do you feel that you received adequate support from your lecturers and clinical staff? If yes, what are some of the ways they supported you?

If no, how would you have liked them to support you?

APPENDIX H: ETHICS CLEARANCE APPROVAL

Cape Peninsula University of Technology

HEALTH AND WELLNESS SCIENCES RESEARCH ETHICS COMMITTEE (HWS-REC)
Registration Number NHREC: REC- 230408-014

P.O. Box 1906 • Bellville 7535 South Africa
Symphony Road Bellville 7535
Tel: +27 21 959 6917
Email: sethn@cput.ac.za

29 November 2021
REC Approval Reference No:
CPUT/HW-REC 2021/H34

Faculty of Health and Wellness Sciences

Dear Dr K Naidoo

Re: APPLICATION TO THE HW-REC FOR ETHICS CLEARANCE

Approval was granted by the Health and Wellness Sciences-REC to **Ms R Moodley** for ethical clearance. This approval is for research activities related to research for **Ms R Moodley** at Cape Peninsula University of Technology.

TITLE: **The Lived experiences of Diagnostic Radiography students undertaking workplace learning during the Covid-19 pandemic**

Supervisors: Dr K Naidoo and Ms H Thomas

Comment:

Approval will not extend beyond 30 November 2022. An extension should be applied for 6 weeks before this expiry date should data collection and use/analysis of data, information and/or samples for this study continue beyond this date.

The investigator(s) should understand the ethical conditions under which they are authorized to carry out this study and they should be compliant to these conditions. It is required that the investigator(s) complete an **annual progress report** that should be submitted to the HWS-REC in December of that particular year, for the HWS-REC to be kept informed of the progress and of any problems you may have encountered.

Kind Regards

Carolynn Lackay
Chairperson – Research Ethics Committee
Faculty of Health and Wellness Sciences

APPENDIX I: EXAMPLE OF FIELD NOTES

FIELD NOTES FG 1

FOCUS GROUP INTERVIEW 1 (online 28 March 2022)

LOGISTICS:

The researcher had conducted an online focus group via the Zoom platform. Zoom was the platform of choice, as Microsoft teams has had security concerns. Participants where given the choice of participating in an online or in-person interview. They also had a few options to choose from with regards to dates and times. This particular group opted for the online option on the 28th March @ 14: 15pm.

Participants did have some connectivity and audio challenges. This was quickly overcome. Students were asked to leave their videos on. However, during the interview, participants switched their videos off.

OBSERVATIONAL NOTES:

The researcher tried to create a calm and open environment prior to the formal interview. She made light conversation with the participants over their recent recess period. This was in the hope of creating a more open environment for participants. There were a few quite moments in the interview when probing questions were raised. The researcher quickly made light of this by calling on participants for their view. Participants felt at ease and started actively participating in the conversation without been prompted. There were a few moments of laughter.

PERSONAL NOTES:

I was nervous to conduct the focus group interview as this was my first ever focus group interview that I have conducted. I was worried about remembering so many things of what to do, what to say, what not to do, what not to say. I felt “bracketing” to be challenging, since as the researcher you cannot “have an opinion” but basically listen and not “react”. I did ramble off and repeat myself in the beginning. One of my challenges was paraphrasing. I felt I did not paraphrase adequately and did not probe enough to bring out more information. I felt it difficult to write notes, paraphrase, listen and think of follow questions at the same time. I eventually did feel comfortable and was at ease having a conversation with the participants. For further interviews I need to probe more and paraphrase better.

METHODOLOGICAL NOTES:

An exploratory, descriptive research approach was used for the focus group interview. This allowed the researcher to explore the participants experiences and paraphrase their experiences and confirm with the participants if that was indeed what they meant. This avoided any misunderstanding of information and was also a form of member checking. The online session was video and audio recorded for later transcription and analysis.

THEORETICAL NOTES:

- This group of students only went to clinicals at the end of 2020 (end of their second year)
- They were not as confident as they hoped they should be with regards to radiographic examinations etc.
- When this group entered their 3rd-year of studies- they felt like they had to relearn first year work – this was due to their lack of exposure into the clinical environment.
- Qualified staff worked with COVID positive patients. However, students were told to take precautions and treat patients as if they COVID positive unless they had a negative result.
- There were a lot of protocols and procedures to follow.
- Some students were fine and not afraid working during the pandemic, whereas some students were scared.
- There was a shift in their feelings at the beginning of the pandemic vs currently.
- At the beginning some students were afraid and currently they have accepted that this is the environment and are not afraid to be in this environment.
- Students were not as concerned for them contracting the virus, but were more concerned of taking the virus home their loved ones.
- Some students enjoyed the pressure of working in the high risk environment.
- Refer to experience – catheter. At 3rd-year student was not comfortable touching the catheter. Lack of exposure to the clinical environment – student felt that she was not at the level she should be.
- Some participants were frustrated/ “annoyed” that there were so many rules they had to follow – unable to interact with friends as normal. Constant reminder of masks, social distancing etc.
- Contrast in how they felt they were treated by clinical staff. Some felt they were treated as lower level students in their 3rd-year whereas some felt that staff were very lenient towards them and helped them along.
- Students felt that they received adequate support from lecturers and clinical staff. When sick – email lecturers. They were allowed to stay home. lecturers very accommodating towards students.
- One student expressed her gratitude in having to had the chance to share some of their experiences and feelings. It was almost therapeutic.
- Recommendation: regular debriefing sessions with students.

APPENDIX J: EXAMPLE OF FG1 TRANSCRIPT

STUDENT 6: I think so to me we didn't really get to work with Covid patients that much in the department. It was mostly like the staff members who were going to the ward to do Covid patients. But I… But we were in second year when Covid started. So, we had like… I think it was the whole year that we didn't have any clinical work. So when we got to third year and we were doing clinicals, it sort of – it felt like I was a newbie in the department again. So I had to like relearn how to take like a basic chest x-ray. And my confidence around patients and stuff like that …[intervenes]

INTERVIEWER: yes

STUDENT 6: …was ja, it wasn't that great.

INTERVIEWER: Okay. So yourl – basically yourl went [audio interference] and Student 7, can you maybe mute yourself, please? Okay. So Student 6, what you are – what you are saying is that working in the hospital, yourl went, when yourl were second year?

STUDENT 6: Covid started in second year.

INTERVIEWER: Covid started in second year. And yourl only went when yourl were in third year?

STUDENT 6: I think it was towards the end of the year that we went in the groups.

INTERVIEWER: Okay. So yourl were in second year when yourl went in there. So you didn't have that much confidence, because yourl had to relearn everything again, working with patients. Okay, I get what you're saying. And you also mentioned that the staff were allowed to work with Covid patients, and not you guys.

STUDENT 6: Yes.

INTERVIEWER: Okay. Okay, I hear what you're saying. And I do have a few questions for you, but I'm going to come back to you. And then we'll just move on to Student 7, and then I'll come back to you. Okay. Okay. You want to mute yourself, and then Student 7 can...

STUDENT 7: Does Ma'am just want to know like what it's like in the Clinical Department or …[intervenes]

INTERVIEWER: What was your …[intervenes]

STUDENT 7: …our entire …[intervenes]

INTERVIEWER: What was your experience? And how did you feel working in the Clinical Department, knowing that there are Covid patients there, and did you – and knowing your at risk in the hospital, and all of that?

STUDENT 7: I was fine working. Okay. I was fine working knowing that there – that there's Covid and stuff like that. But it was just a big adjustment, because we had to follow like these rules. Like we couldn't like be close to one another. And since we didn't get any clinical training for like a long time, since first year, in first year we were like already, like I don't know much, so in third year already, when we came back, it was a big adjustment for us, because like we had to like relearn everything that we – that we had to do. So ja.

INTERVIEWER: Okay. So third year was a big shock for you guys, and you – you yourself, Student 7, you were fine working in the – in the environment, knowing that it was a Covid-19 pandemic, but you just felt that it was a very big adjustment for you guys, because yourl didn't have that much clinical training prior to coming end of second year into the hospitals?

STUDENT 7: Yes Ma'am.

INTERVIEWER: And… Okay, I hear what you saying. And I have a few questions for you when we come back. But I'm just going to move on to Student 8 and see if she – what's her view as well.

STUDENT 8: Okay, Ma'am. So, I actually was very excited to work during the Covid period, because like I thought that we could learn a lot more, and like under pressure… Like first we were put under pressure like don't do it this way, don't do certain stuff that way. There were protocols that we had to follow and stuff. It was like interesting, but like also scary because like you are working with actual… Like we weren't allowed to work with Covid patients, but, you know, they told us that every patient that comes in, is basically a Covid patient until like they tested negative. So it was like very interesting. And yes, the pressure was there, because like Student 7 said, and Student 6 said that from first year to like we jumped to third year clinicals. So like it was a big jump. But I mean after that we all picked up very quickly, because we were determined to like, you know, pass and whatever. So ja.

INTERVIEWER: Okay. So for you it was an exciting time for you. And did you enjoy the – the pressure of working under those circumstances?

STUDENT 8: I did.

INTERVIEWER: You did. Okay.

STUDENT 8: Yes, I did. I enjoyed it. And I feel like it taught me a lot also. Like the pressure also teaches you a lot.

INTERVIEWER: Yes, it does. Okay. And you say that you also picked up very quickly.

STUDENT 8: Yes, because I feel like we were…like…I don't know how to explain it, but we picked up quickly, because we were determined to like be the third years. Because like, people – like the fourth years, there were fourth years when we were third years. So they were second years and we were first years. So we wanted to be like them. Like we were…when you have like role models and stuff?

INTERVIEWER: Yes.

STUDENT 8: So it was basically like that. Like it was like a - you had to look up to someone. So like we needed to be ready for that.

INTERVIEWER: Okay. So you had to be the role models for the younger students?

STUDENT 8: Yes. Even though we didn't really meet a lot of the second and first years and third years, but like we knew that fourth year we will be meeting a lot of them. So it was exciting.

INTERVIEWER: Okay. I hear what you saying Student 8, and I have a few questions for you when we come back. I am going to come back to you, if you don't mind. I see Student 5 has joined us. Student 5?

STUDENT 5: Okay, Ma'am, can I check if you can hear me now?

INTERVIEWER: Oh, we can hear you loud and clear, Student 5.

STUDENT 5: Okay, perfect. Perfect.

INTERVIEWER: Thank you so much. Are you on your phone now?

STUDENT 5: No. I'm still using my laptop, but I put a headphone in, and now, you can hear me.

INTERVIEWER: Yes, now I can hear you very clearly. So the basic question was to tell me about your experience of working during the Covid-19 pandemic. So basically, it's like how did you feel working during that time? What was your experience of working during that time? Well, we are actually still - guys, we are still in the Covid-19 pandemic. So, it's still, whatever you are experiencing now, starting from then.

STUDENT 5: So obviously in second year when it started, we were told immediately to stay at home. And then when we returned in the third year, or maybe it was towards the end of our second year when we returned, either or, I actually felt scared. I'm not going to lie. Because in

that year we were staying away from people. We were isolating. We were trying to keep safe, per se. And now, all of a sudden, returning back to the hospital, for me that was quite a scary experience, because we had Covid cases within our household. So going back to hospital all of a sudden after staying away from people, after, you know, trying to keep that distance apart, it was now a completely different concept, because here we have to touch people. We have to fully engage with people, even the staff that we working with. They standing right next to you, just because of that's the nature of our work. So for me, that beginning phase was quite scary, but after a while you start to just get used to it, and, you pick up on the pace that you left off. So like Student 8 was saying, we put this kind of pressure on ourselves, to make up for the year that we lost, per se. Because in my mind, I actually, that is how I feel, I feel that we actually lost a year of training, a year of gaining more experience. So in that third year it was like a catch up session. So other than just dealing with your third year, it was now okay, you also need to catch up with what you lacked in your second year. So with all of that, for me it was quite stressful. I know some people could cope under the pressure, but personally I felt like I just needed more time, like there just needs to be more time, or I just need more training, or I just need more of something. So that was my experience.

APPENDIX K: EXAMPLE OF FG2 TRANSCRIPT

STUDENT 1: And then, ja, and then put that immediately in the wash. And ja, that was like the main thing that I noticed, that I practiced as well.

INTERVIEWER: And when you said put it in the wash, did you put it with the other clothes, or did you wash it separately?

STUDENT 1: I washed it separately. So all the scrubs would be together.

INTERVIEWER: Okay. So you did all the scrubs together, and all your – all your own clothes else as well separately?

STUDENT 1: Ja. Ja.

INTERVIEWER: Okay. Does anybody else want to add anything to this? Thank you, Student 1. I hear what you are saying there.

Okay. So tell me, was there any experience maybe that you had with a patient that had – that stood out with you guys? Also yourl mentioned about coming back in third year, was it Student 2? You mentioned about your lost clinical time, and then when yourl came back in third year… Can you just tell me more about that, Student 2, about how did you feel coming back in third year, and you said you lost a lot of clinical time?

STUDENT 2: At first, Ma'am, yes, I was nervous coming back, and I lost quite a lot of time in second year. So I was nervous. But then I thought no man, maybe when I get there, I will catch up and things will be fine. And yes, when we got there, things were fine.

INTERVIEWER: Yes

STUDENT 2: But then you could – we could, or I could feel the pressure sometimes. When they would like… It would not happen with everyone, every staff member, but then some would say oh, okay, you can't do this. You are in your third year. How? And then to move the machine a certain way, they were like but you are in your third year, how can you not do this? But I could understand where they were coming from. Some, they don't even realise that the only foundation that we had at that time was first year, because we only had that three weeks or four weeks of 2nd-year clinicals. So the only foundation we had was first year. So we were bound to forget something, some things. And yes, that did place a lot of pressure, and that did place a lot of pressure for me, because I also remember that I had an incident like that where a staff member told me that how come you can't do this, but you are in the third year. Look at other – at the other students. I am like okay, we were not the same, and it has been a while since I was not here. So it is fine to forget. But then just helping me and showing me how it is done would be fine. Then you see if next time I do forget, then that is when you can bring up

the thing of okay, now you are in third year. But then we did cope. We did cope. And we did try to catch up. We did try to catch up and cope, and yes, I did that.

INTERVIEWER: Student 2, how did this make you feel when the qualified asked you that? How did it make you feel when they asked you but you are a third year now, why don't you know this? or Look at other students and they know it and you don't? So how did that make you feel?

STUDENT 2: It made me feel like I know nothing.

INTERVIEWER: Yes.

STUDENT 2: Like they are undermining my knowledge now. Like, girl where have you been? – it is like them saying, "Girl, where have you been this whole time?

INTERVIEWER: Yes. And then how did you overcome this feeling?

STUDENT 2: I kept trying, honestly, Ma'am. I just kept trying, you know, observing more, trying to practice a lot. And then until I was… I will not say I was perfectly confident, but then until I saw myself that okay, now I am getting there. I am slowly going back, and I now can feel that I – I am getting used to the environment again.

INTERVIEWER: Okay. And was there anything that the clinical staff did that helped you guys overcome this? I mean if they did tell you… I mean if they are saying that you are not, like why don't you know this, this and this, and you are supposed to be at a certain level, did they help you maybe if you did not know something, did they show you, or how did they assist you? Or did they assist you?

STUDENT 2: Yes, they would assist us Ma'am. They would assist us. Because even with my incident, she ended up showing me how it is done, and then I had to explain for her in order for her to understand why I can't do it, or I was struggling to do it. And then she could understand. But then even with us saying that Ma'am, it is because I was not here for my second year, it is like… To them, it started… I don't know if it was me, or it slowly started to seem as if it is like where it is this excuse that you are making now whenever we had these mistakes. But then also the – the thing of you don't want to seem as if you don't know anything. So you might as well just explain yourself - why you can't do this.

INTERVIEWER: Yes. Okay. I hear what you are saying.

STUDENT 2: Yes.

INTERVIEWER: And did anybody else have any similar experience than what, like what Student 2 had? Student 4 or Student 1 ?

STUDENT 1: Yes Ma'am, I had the same experience or a similar experience where the qualified asked me in the same words, that how am I a third year, and she explained that I know, she can see that I know the basics, but it is the extra things that I am not aware of, that she said that I must spend a bit more time with my books, and… But then afterwards she actually explained to me in detail how to do it, and she showed me. And then or I showed… I changed my wording of… When they had asked me to do a repeat, I would ask him what do you want to see better and how can I improve it. And then via that, by doing so it actually got better as well.

INTERVIEWER: Okay. So… So you changed to say… You just didn't take it when they say "repeat". You wanted to know what can you do better?

STUDENT 1: Ja, to make the process a bit better than …[intervenes]

INTERVIEWER: And …[intervenes]

STUDENT 1: So that I could train my eye as well.

INTERVIEWER: And initially when they did tell you that, how did that make you feel?

STUDENT 1: I was embarrassed as well, because I was feeling like, like I can do better, and yes, I am on that level, and I had exposure to the information, even though I didn't have the physical exposure, or the theoretical at least. But then I – I wasn't so hard on myself, and I seek support from friends and family as well. And ja, that helped me a lot to gain more experience and to just keep trying.

INTERVIEWER: Okay. Now when you say "friends and family", is any one of your family members a radiographer, or – or did they give you other support?

APPENDIX L: EXAMPLE OF FG3 TRANSCRIPT

INTERVIEWER: Okay. And the PPE, how was that for you all? Like how was it to adjust to it?

Student 12: not nice at all.

STUDENT 11: Ja, it was long gowns with aprons, and gloves, masks, a shield. So it was, ja.

INTERVIEWER: And did yourl have to undergo training for that?

STUDENT 11: No.

Student 12: No, we just had that online thing.

STUDENT 10: Yes, there was something from the academic staff, not from the clinical staff -there was no PPE training.

INTERVIEWER: Okay. So yourl did have that PPE training.

STUDENT 9: From the academic staff.

INTERVIEWER: From the academic staff. And then yourl went into practice, and then yourl had to use all these things.

STUDENT 12: Yes.

INTERVIEWER: And now this was very new to yourl. How did yourl cope with… that people that might be Covid positive, having to use all of this, plus going late. How did yourl cope? How did yourl overcome all that?

STUDENT 11: I think it was overwhelming at the start. And then you get used to it. Because you are doing it every day now. So it starts – it becomes a habit. You just do it. And then I think, you get to this point, like I don't care now. I don't even care anymore.

STUDENT 10: Yes.

STUDENT 11: Because it's so tiring that you get to that point - this is enough. So I don't care. Lets just, put it on. Get it over with. You don't even think about it. Like I feel there was a stage where… Because like the hospital had like screening forms, and at the beginning I was like…mmm, it's only a screening form. It's not a test, test. So how do they actually know if the patient is like being honest or like… Because there was so many stories, like all the symptoms and this and that. So you didn't really know if the screening form says "screened negative", if that is actually negative.

INTERVIEWER: So was there anybody checking those forms?

STUDENT 10: It went to someone, but… The sister, ja.

STUDENT 11: Ja, the sister.

STUDENT 9: Ja, the sister screened the patients.

INTERVIEWER: Before they came to your department?

STUDENT 10: Before they came to us.

INTERVIEWER: Okay. So do you feel that was not enough, because you wasn't sure if the patients are lying, as you said?

STUDENT 11: Ja. So I don't know what they could have done more, but …[intervenes]

STUDENT 9: It's inaccurate.

STUDENT 11: Ja.

STUDENT 10: It's not accurate.

STUDENT 11: Because I feel you can screen negative, but you can still maybe test positive. So it's not a hundred percent. So even though we only did patients that screened negative, we could have still been exposed. Because I know like one of my friends, she worked in CT, and the patient screened negative. And then two days later they said, but the patient tested positive. And for us just coming back, especially from the home environment where you're like hearing all the stories, and everybody is stressed, and don't really know what's going on, and your mom is stressing and calling you at night, be safe, wash your hands, da da da da da, and then you hear stories like that. You just like, okay, whoa.

INTERVIEWER: And then… So that… That experience of your friend stood out for you?

STUDENT 11: Yes.

INTERVIEWER: How did you feel during that time?

STUDENT 11: You feel unsafe then. And then, I don't know, you think, are you really safe? But nobody was safe, but it's still… It's overwhelming. And then like you – you are scared to go home to your parents, because maybe you get it, and then you take it back home. So you just stay here. You are very isolated. You don't really even see anyone. We… Like, I can't remember seeing anyone in my class, except the people I work with.

INTERVIEWER: And what do you think we could have done, or the academic staff, or the clinical staff could have done to help yourl mentally? Because that… You said that you were isolated. You didn't see anybody.

STUDENT 11: Ja.

INTERVIEWER: So… And your experience of your friend also affected you. So what could we have done in those type of situations to help you guys cope better?

STUDENT 9: I'm not talking about MITS, but ### itself offered mental health help, counselling, ja. Because I often… I still get emails. But not all the students check their emails regularly. And I feel like from the department they could have just made, like it more alert on saying that there is actually help from CPUT's side. They will encourage us to participate if we need help, or ja, I feel like the department should've like, just make it more known.

INTERVIEWER: Make the people more aware.

STUDENT 9: Yes. Yes. Aware of the help that is available. Because we can't say CPUT didn't offer any help. But I feel like the department should just make it aware.

INTERVIEWER: Because now you said not everybody checks their email. So it's not like it's constantly there. I mean they send it, but you don't know whether somebody is actually reading it.

STUDENT 9: Ja.

INTERVIEWER: So it should be more open …[intervenes]

APPENDIX M: EXAMPLE OF FG4 TRANSCRIPT

STUDENT 16: I had to - I had to, ja, remind myself of what I did the first year. I refreshed my memory. So it took me quite back a little bit before getting into the mode of working. And then coming to the hospital, I had just sensed people were just scared a lot, so especially patients were very few. So we didn't really get that much of exposure. And ja, I didn't get enough exposure to saying, especially in terms of logbooks, like the amount of procedures they wanted us to complete. Because that logbook was just set based pre-pandemic, right before the pandemic, and now we had to get some procedures done, which were unavailable during the pandemic period. So ja, exposure, I didn't really get a lot. And then in terms of getting specialised views and those things, I didn't really get a lot of that. And we were limited to do some mobiles, and some patients based on if a patient is considered a high risk or low risk Covid. So I felt restricted in a way, and limited to be exposed to a lot of clinical practice time, as much as I would have wanted pre-pandemic.

INTERVIEWER: Okay. So you say that people were scared. All right? Now how – how did you feel going? Were you also scared?

STUDENT 16: For me personally, I wasn't scared, like I wasn't scared, but it affected how – how it affected the relationship. Like if everybody is scared around you, it doesn't matter how you – you bring yourself, or what you are bringing. They perceive you in other ways, and they have a lot of – a lot of boundaries to say. Especially, we had like rules now that there do not have to be a lot in one place, so that also affected the relationship and the work relationship, like a group relationship in the workplace. Like you have to kind of be isolated. And some procedures, it's impossible to do alone, or in a small group. So some people were sceptical. So ja, that… Ja, but me personally, I wasn't scared. I was just, ja, I was just fine.

INTERVIEWER: So you say that some people were scared, right, and you did notice that some people were scared, especially from your – your colleagues or people in the department, but for yourself, you weren't that scared.

STUDENT 16: Yes, I wasn't scared.

INTERVIEWER: Okay. How did you interact, or how did you face people that wasn't scared, or how did people face you, because you weren't fearful of it, but they were?

STUDENT 16: I tried to look at things from their perspective, how they see it, or how – what am I supposed to be doing to make them feel a little bit safer around working with me. Basically, maybe if someone is – if maybe a colleague was obsessed with the cleaning of hands alot, so I will just make sure that then I do that more often and they see that, to make them feel a bit safer. So …[intervenes]

INTERVIEWER: And maybe make them feel a bit more comfortable …[intervenes]

STUDENT 16: More comfortable working with me. Ja.

INTERVIEWER: Okay. Okay. And you also say that you were restricted in terms of exposure to – to examinations and stuff.

STUDENT 16: Yes.

INTERVIEWER: Is there anything that you did, or that was done for you to help you with that?

STUDENT 16: Yes. I think the lecturers were considerate in a way that it wasn't totally compulsory to get all of the views, so the numbers, the numbers were cut down. So whatever exposure we could get, they – that was acceptable, but within a range of how much time we spent in the hospital. Because we even went into the next year trying to finish up or spending more time in the Clinical Department. So we were not really… The lecturers were understandable, and they were understanding that some procedures, it was really hard to get them, based on the patient capacity, the patients coming to the hospital. So that was… That helped in a way, in a way. But personally in terms of skills, it was a strain, because you want to be exposed to a lot of things. But on the academic side we were accommodated to say.

INTERVIEWER: Okay. So they did accommodate you?

STUDENT 16: They did accommodate us.

INTERVIEWER: Okay. So there are a few more things I want to ask you, but lets – let move on, and then we'll come back to you. Anybody else wants to speak? Yes Student 13?

STUDENT 13: Well, for me, coming back into the department after or during the Covid time, was really, really - I was really freaked out, because I was scared. I didn't want to contract the disease. And it got better when they told us that okay, you don't have to – as students we don't have to do Covid patients or high – patients that are still under investigation of the Covid virus. And the other thing that freaked me out was when we got here at the hospital, we had to put on a personal protective equipment. But then we would walk around like everywhere, even when we are coming out, or coming to the school, we are dressed in this personal protective equipment. I'm like oh no, we are really, really going to get sick here. And so I managed the whole thing, because it was sort of messing me up. When I would get to my room at Res, I would bath in hot, hot water. I made sure that every time I leave the hospital, or after doing a patient, I will bath myself in hand disinfectant and surface disinfectant, just to make sure I don't catch anything. My mask is always on. My gloves are always on. So it was really

frustrating at times, but I got used to it. I wouldn't say it was that much of a train smash, but I just got used to it with time, ja.

INTERVIEWER: And how did you feel having to - you say you were freaked out, right?

STUDENT 13: Yes.

INTERVIEWER: And because knowing that you can contract …[intervenes]

STUDENT 13: Ja.

INTERVIEWER: …the virus, and it is in such an environment like that, how did you overcome that feeling?

STUDENT 13: Well, I… It was me just getting used to the whole thing. I didn't sort of like follow a routine. I just got used to the whole thing, until they told us that we don't have to wear the personal protective equipment anymore. Then it got better. Because I felt like that thing was sort of just transmitting it everywhere.

INTERVIEWER: The PPE was …[intervenes]

STUDENT 13: The PPE, ja.

INTERVIEWER: So you didn't feel that the PPE was protecting you?

STUDENT 13: No, I didn't feel like it was protecting me in any way.

INTERVIEWER: You felt that that can?

STUDENT 13: It can just transmit the virus, because we are just walking everywhere with that, and we are not taking it off or anything like that. Ja.

INTERVIEWER: And you mentioned that when yourl come up here to the radiography school …[intervenes]

STUDENT 13: Ja.

INTERVIEWER: …that you also had the PPE on.

STUDENT 13: Ja, we still had it on. We didn't take it off.

APPENDIX N: MEMBER CHECKING OF THEMES AND CATEGORIES

The lived experiences of diagnostic radiography students undertaking workplace learning during the COVID-19 pandemic.

Dear Participant

You had taken part in the above-mentioned research study during your 4th year of the BSc: Radiography programme. To re-cap, the aim of this study is to explore and describe your experience as a diagnostic radiography student who undertook workplace learning (clinicals) during the COVID-19 pandemic. Through your experience, I seek to develop guidelines and recommendations for educators to better support students during pandemics. To ensure credibility of this research study, I need to confirm if your experiences have been accurately understood and captured. The following themes and categories are the main aspects that were highlighted during all 4 focus group interviews that were conducted either virtually or face-to-face in 2022.

Theme 1: Perspectives towards workplace learning (WPL)

Category	Description
Mixed emotions returning to workplace learning.	The participants experienced a mix of emotions upon returning to WPL. They felt positive emotions like excitement and the ability to learn under pressure. However, they also faced negative feelings, such as fear and being overwhelmed upon returning to the clinical environment.
Experiences with Personal Protective Equipment (PPE)	The study participants expressed concerns about their lack of knowledge and training in using PPE correctly. Initially, some felt uneasy and feared potential COVID-19 transmission due to incorrect usage. However, as time passed, using PPE became a mundane and frustrating routine.
COVID-19 impact on personal life	Participants faced unique challenges due to the pandemic. These challenges included feelings of isolation, fear of infection, and concern about infecting their families. Uncertainty, anxiety, and a desire for the pandemic to be over were prevalent.
COVID-19 Protocols	The clinical environment underwent significant changes due to the introduction of essential COVID-19 protocols. Participants were advised to treat all patients as if they were COVID-19 positive, regardless of their screening results. This was a practice that some found cautionary. Many participants were sceptical about the effectiveness of screening protocols. Nevertheless, the participants appreciated the clinical staff's support in helping them adjust to the new routines.

Adapting to the new clinical environment	The participants of this study provided insight on how they adapted to the new clinical environment during the COVID-19 pandemic. Initially, fears and challenges existed, but through observation and guidance from clinical staff they adjusted to the changes.

Theme 2: Barriers for Effective Clinical Training

Category	Description
Missed clinical training.	At the start of the COVID-19 pandemic, participants experienced almost a year-long absence from their clinical training in their second year of study. Participants had to catch up on past and current coursework, leading to immense pressure, stress, and a lack of confidence. Some participants realised the highly practical nature of radiography and regretted choosing a career that demanded such extensive hands-on involvement.
Radiographer expectations.	The participants described how the radiographers at the hospital made remarks about their insufficient experience given their academic level of study. The participants were compared to first-year students, which left them feeling highly disheartened and as though they were imposing a burden on the staff.
Lack of clinical tutorials.	The participants expressed how the lack of clinical tutorials from their university educators affected their ability to learn effectively. With the change to online learning during the pandemic, students were supplemented with video tutorials. Participants felt that this was insufficient as they were unable to physically practice positioning techniques typically done in face-to-face tutorials. As lockdowns eased and WPL resumed, students learned new techniques during patient exams from senior radiographers. This affected their clinical training as there were differences in the teaching techniques between the more senior radiographers and their educators.
Difficulty completing logbook.	A participant explained that the reduced patient volume in hospitals during the pandemic made it difficult to meet logbook requirements, which were set before the pandemic. With fewer elective and non-urgent cases, students had limited patient interactions and struggled to log the necessary cases, leading to increased stress levels among participants.

Theme 3: Enablers of Effective Clinical Training

Category	Description
Effective Communication with educators	Participants emphasise the importance of good communication with educators during clinical training. They expressed feeling comfortable discussing their health concerns and experiences with their educators. Educators provided valuable advice during challenging situations and were considerate of logbook requirements. Participants viewed their educators as accommodating and supportive.

Positive student attitudes.	The study participants emphasise that maintaining a positive outlook while working during the COVID-19 pandemic improved their clinical experience. Past experiences with other disease outbreaks influenced the way in which the COVID-19 pandemic was approached. Contentment regarding participants' career choices emerged as they recognised the essential role of radiographers in healthcare. The participants also appreciated constructive criticism of their clinical work received from clinical staff, as it motivated them towards achieving success in their radiography careers.
Supportive staff.	The study participants shed light on the ways in which clinical staff played a crucial role in encouraging them through the challenges of the COVID-19 pandemic. Staff's support, patience, and understanding of the participants' difficulties, such as missing clinical time during the lockdown, proved instrumental in helping them regain confidence in their clinical experiences.

Theme 4: Coping Mechanisms

Category	**Description**
Family and peer support	The participants conveyed the essential role of family and peer support in coping with the challenges of the COVID-19 pandemic. Their families encouraged them to approach each day as it came and motivated them to persevere. The participants also expressed how their peers worked together and supported each other. Their peers were faced with the same situation and could therefore understand and relate to each other in ways others could not.
Educator Support	The participants expressed gratitude for the various methods of support they received from their educators. Participants also appreciated the availability of supplementary tutorials that were provided.

Kindly indicate if you agree that the above themes and categories are representative of the views and opinions and that it is a true reflection and correct interpretation of your lived experience of WPL during the COVID-19 pandemic, as expressed during the interviews.

Note: your identity details will be anonymised to protect your identity.

☐ **Yes**, this is a true reflection of the experiences conveyed during the focus group interviews.

☐ **No**, this is **not** a true reflection of the experiences conveyed during the focus group interview.

If no, please elaborate:

_____

_____

_____

Please feel free to make any addition comments:

_____

_____

_____

_____	_____	_____
Name of Participant	Signature of Participant	Date
_____	_____	_____
Name of Researcher	Signature of Researcher	Date

APPENDIX O: GRAMMARIAN CERTIFICATE

Napier

7270

Overberg

Western Cape

03 June 2024

LANGUAGE & TECHNICAL EDITING

Cheryl M. Thomson

THE LIVED EXPERIENCES OF DIAGNOSTIC RADIOGRAPHY STUDENTS UNDERTAKING WORKPLACE LEARNING DURING THE COVID-19 PANDEMIC

This is to confirm that I, Cheryl Thomson, executed the language and technical editing of the above-titled dissertation of **RAMONA MOODLEY, student no. 221591052,** at the **CAPE PENINSULA UNIVERSITY OF TECHNOLOGY**, in preparation for submission of this dissertation for assessment.

Yours faithfully

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