



**LIVED EXPERIENCES OF DIAGNOSTIC RADIOGRAPHERS WORKING IN THE  
PUBLIC HEALTH SECTOR IN ESWATINI**

By

**THOBILE LUNGILE SEYAMA-GININDZA**

Thesis submitted in fulfilment of the requirements for the degree

**Master of Science: Radiography**

**In the Department of Medical Imaging and Therapeutic Sciences**

**Faculty of Health and Wellness Sciences**

**At the Cape Peninsula University of Technology**

**Supervisor: Dr Kathleen Naidoo**

**Co-supervisor: Mrs Yanda Peter**

Bellville Campus


Date Submitted: (June 2022)

**CPUT copyright information**

The thesis may not be published either in part (in scholarly, scientific or technical journals), or as a whole (as a monograph), unless permission has been obtained from the University.

## **DECLARATION**

I, **Thobile Lungile Seyama-Ginindza**, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed: 

**Date: 22 June 2022**

## **ACKNOWLEDGEMENTS**

### **I wish to thank the following:**

- God my creator, for giving me strength, courage and wisdom in challenging times.
- My family, for their continuous support and love.
- My research supervisors, Dr Kathleen Naidoo and Mrs Yanda Peter, for their support and guidance.
- Mrs Nomsa Shongwe, my mentor, for her support through this journey.
- All my research participants for agreeing to be part of the study.
- Ms Julia Martinelli of Cyber Transcriptions for transcribing the audio recordings to verbatim transcripts.
- Dr A.S. Shabangu and Ms S. Motsa for allowing me use of their boardrooms to conduct focus group interviews.
- Finally, my sincere gratitude goes to the whole administration, Faculty of Health and Wellness Sciences, Centre for Post Graduate Studies and the entire CPUT community for support and guidance in this opportunity to fulfil my dream of achieving this level of education.

## **DEDICATION**

I dedicate this thesis to my father and my late mother.

Daddy, you have been a great father to me and my siblings. Your love and care cannot be compared to anything on this earth. You have proven what it means to be a caring parent with ambitions to change history for the next generation in a family lineage.

## ABSTRACT

**Introduction:** A radiographer is responsible for producing diagnostic images of a patient to assist radiologists and physicians in diagnosing patient conditions. The extent of a radiographer's duty requires the independent performance of highly complex diagnostic procedures, an extensive theoretical background and clinical training and be adept at using various imaging modalities. A lack of radiologists in most African countries, coupled with an increasing number of patients requiring radiology services, has put a strain on the radiographer's role and led to expansion of work scope. Radiographers must be able to practice in synchronisation with current legislations governing the use of ionising radiation for medical purposes. A lack of professional recognition, stagnation within the profession and poor salaries are the main experiences that encumber a positive radiographic experience. The introduction of a self-directed environment and improvement in the profession can enable a positive experience by allowing radiographers to practice independently and benefit from respect for the profession

**Background:** The phenomenon of organisational management of the radiography profession is poorly understood in the public health sector of Eswatini. Medical imaging personnel duties and daily experiences are misperceived by seniors.

**Aim:** The aim of this study was to explore and describe the lived experiences of diagnostic radiographers working in the public health sector in Eswatini. Moreover, the study intended to develop guidelines to support radiographers during practice.

**Methods:** A qualitative, exploratory, descriptive and phenomenological design was utilised. Participants were purposively sampled within the public health sector. Diagnostic radiographers participated voluntarily and willingly consented to participate in focus group interviews (n=18).

**Results:** Four main themes emerged, with 16 contributing categories. The overall sense was that Eswatini diagnostic radiographers have challenging work experiences and endure feelings of demotivation, council constraints and a lack of professional autonomy. However, their pride in being radiographers was well articulated

**Conclusions:** The findings of this study provide new insights into what Eswatini radiographers are experiencing in the public health sector, which enabled the identification of future research and performance gaps relevant to radiography within Eswatini. Study results revealed that radiographers are faced with a challenging work environment where there are constraints in both human (radiographers and radiologists) and material resources (consumables). Furthermore, there is a lack of guiding documents such as SOPs, policies, guidelines and

standards. The development of guidelines in this study would support the radiography professionals whilst endeavouring to meet other international or regional requirements.

**Keywords:** Eswatini public health sector, radiography, diagnostic radiographers, lived experiences, resource-limited country, quality imaging services

## ABBREVIATIONS and ACRONYMS

<b>ALARA</b>	As Low As Reasonably Achievable
<b>ARRT</b>	American Registry of Radiologic Technologists
<b>BSS</b>	Basic Safety Standards
<b>CM</b>	Contrast media
<b>CMS</b>	Central Medical Stores
<b>CME</b>	Continuous Medical Education
<b>CPD</b>	Continuous Professional Development
<b>CR</b>	Computed Radiography
<b>CT</b>	Computerised Tomography
<b>DoH</b>	Department of Health
<b>DICOM</b>	Digital Imaging and Communications in Medicine
<b>EHRRB</b>	Eswatini Human Health Research Review Board
<b>EMDC</b>	Eswatini Medical and Dental Council
<b>ESR</b>	European Society of Radiology
<b>FAO</b>	Food and Agriculture Organization
<b>GSR 1</b>	General Safety Requirements 1
<b>HPC</b>	Health Professions Council
<b>HCPC</b>	Health and Care Professions Council
<b>HPCSA</b>	Health Professions Council of South Africa
<b>IAEA</b>	International Atomic Energy Agency
<b>IAEA-TECHDOC-1067</b>	International Atomic Energy Agency Technical Document -
<b>ILO</b>	International Labour Office
<b>ISO 9001</b>	International Standardization Organization 9001
<b>IT</b>	Information Technology
<b>ISRRT</b>	International Society of Radiographers and Radiologic Technologists
<b>ICRP</b>	International Commission of Radiological Protection
<b>MOH</b>	Ministry of Health
<b>NHS</b>	National Health Service
<b>NHSSP 11</b>	National Health Sector Strategic Plan 11
<b>PACS</b>	Picture Archiving and Communication System
<b>PPE</b>	Personnel Protective Equipment
<b>PS</b>	Principal Secretary in the Ministry of Health

<b>RPSC</b>	Radiation Protection Safety Culture
<b>RPO</b>	Radiation Protection Officer
<b>SOP</b>	Standard Operation Procedure
<b>TLDs</b>	Thermolumiscent Dosimeters
<b>UNSCEAR</b>	United Nations Scientific Committee on the Effects of Atomic Radiation
<b>WHO</b>	World Health Organization

## **DEFINITIONS**

**Cadre:** ‘a small group of people who are specially chosen and trained for a particular purpose’ (*Oxford Advanced Dictionary, 2015:203*).

**Lived Experience:** the representation and understanding of a research participant’s experiences, choices and options, and understanding how these factors influence one's perception of knowledge (*Given, 2008:172*).

**Scope of practice:** is the limit of one’s knowledge, skills and experience and is made up of the activities carried out within one’s professional role (*HCPC, 2021:1*).



<b>Declaration</b>	<b>i</b>
<b>Acknowledgements</b>	<b>ii</b>
<b>Dedication</b>	<b>iii</b>
<b>Abstract</b>	<b>iv</b>
<b>Abbreviations and Acronyms</b>	<b>vi</b>

## TABLE OF CONTENTS

### CHAPTER 1:

<b>INTRODUCTION .....</b>	<b>1</b>
1.1 Background.....	1
1.2 Problem statement .....	4
1.3 Research question and objectives.....	4
1.4 Aim and objectives.....	4
1.5. Overview of methodology.....	5
1.5.1 Research population and sample.....	5
1.5.2 Data collection.....	5
1.5.3 Data analysis.....	6
1.5.4 Trustworthiness.....	6
1.5.5 Ethical consideration.....	6
1.6. Conclusion.....	7
1.7 Division of chapters.....	8

### CHAPTER 2:

<b>RESEARCH DESIGN AND METHODOLOGY.....</b>	<b>9</b>
2.1 Introduction.....	9
2.2 Research design.....	9
2.2.1 Qualitative study.....	9
2.2.2 Phenomenology.....	10
2.2.3 Exploratory studies.....	11
2.2.4 Descriptive studies.....	11
2.3 Research methodology.....	11
2.3.1 Research setting.....	12
2.3.2 Research population sampling .....	13

2.3.2.1 Eligibility criteria.....	14
2.3.2.2 Inclusion criteria.....	14
2.3.2.3 Exclusion criteria.....	14
2.4 Data collection.....	15
2.5 Data analysis.....	17
2.6 Trustworthiness.....	18
2.6.1 Credibility.....	18
2.6.2 Dependability.....	18
2.6.3 Transferability.....	19
2.6.4 Confirmability.....	19
2.7 Ethical considerations.....	19
2.7.1 Beneficence and non-maleficence.....	20
2.7.2 Justice.....	20
2.7.3 Autonomy.....	20
2.8 Summary.....	21

## **CHAPTER 3:**

<b>PRESENTATION AND DISCUSSION OF FINDINGS.....</b>	<b>22</b>
3.1 Introduction.....	22
3.2 Demographics of the study sample.....	22
3.3 Description and discussion of findings.....	23
3.3.1 THEME 1: Challenging work environment.....	23
3.3.1.1 Category 1: Lack of resources.....	24
3.3.1.2 Category 2: Shortage of radiographers.....	26
3.3.1.3 Category 3: Absence of a radiologist.....	27
3.3.1.4 Category 4: Lack of proper radiation monitoring and safety practices.....	29
3.3.1.5 Category 5: Poor remuneration.....	30
3.3.1.6 Category 6: Stagnant professional growth.....	31
3.3.2 THEME 2: Council constraints.....	33
3.3.2.1 Category 1: Poor representation.....	33
3.3.2.2 Category 2: Scope of practice for radiographers.....	35
3.3.2.3 Category 3: Improper or absence of guiding documents.....	36

3.3.3 THEME 3: Lack of professional autonomy.....	37
3.3.3.1 Category 1: Radiographers have no power or are not involved in decision-making.....	38
3.3.3.2 Category 2: Not well recognised and not appreciated.....	39
3.3.4 THEME 4: Sense of professional pride.....	40
3.3.4.1 Category 1: Love for the profession.....	40
3.3.4.2 Category 2: Making a difference during COVID-19.....	41
3.3.4.3. Category 3: Good working experience.....	42
3.4 Conclusion.....	43

## **CHAPTER 4:**

<b>GUIDELINES, RECOMMENDATIONS AND CONCLUSIONS.....</b>	<b>44</b>
4.1 Introduction.....	44
4.2 Overview.....	44
4.3 Guidelines.....	44
4.4 THEME 1: Challenging work environment.....	45
Guideline1: Development of a proper management structure.....	45
4.4.1 Bridge the gap between higher-level management and clinical radiographers.....	46
4.4.2. Motivate for the use of tele-radiography and Artificial Intelligence.....	47
4.4.3 Develop a mentorship and orientation programmes for new staff .....	48
4.4.4 Delegate one radiographer to act as a radiation protection officer (RPO).....	49
4.5 THEME 2: Council constraints.....	50
Guideline 2: Development of radiographic practice standards.....	50
4.5.1 Appoint a council representative within the departments.....	50
4.5.2 Clearly define the role of a radiographer.....	51
4.5.3 Develop a standard operational procedure for ordering .....	51
4.6 THEME 3: Lack of professional autonomy.....	52
Guideline 3: Encourage professional growth and development.....	52
4.6.1 Build a radiographer identity.....	52
4.6.2 Participation in CPD.....	53
4.6.3 Encourage evidence based practice in radiography.....	54
4.7. THEME 4: Sense of professional pride.....	55

Guideline 4: Create a supportive environment for radiographers.....	55
4.7.1 Have monthly peer discussions.....	55
4.7.2 Dedicated tea/lunch room for socialising and distressing.....	55
4.8 Conclusions.....	56
4.9 Recommendations.....	57
4.10 Limitations.....	58
4.11 My reflection of the study.....	58
<b>REFERENCES.....</b>	<b>60</b>

### LIST OF FIGURES

<b>Figure 2.3.1:</b> Map depicting Eswatini geographical regions and towns to present geographical locations of public healthcare facilities with radiology departments ( <a href="https://geology.com/world/swaziland-satellite-image.shtml">https://geology.com/world/swaziland-satellite-image.shtml</a> ).....	13
--	----

### LIST OF TABLES

<b>Table 2.3.2.</b> Focus group interview demographics.....	14
<b>Table 3.3:</b> Themes and categories.....	23
<b>Table 4.1:</b> Themes and guidelines strategies.....	45
<b>Table 4.2:</b> Orientation programme for newly employed radiographers.....	49

### APPENDICES

<b>Appendix A:</b> Information letter.....	80
<b>Appendix B:</b> Consent for participation.....	83
<b>Appendix C:</b> Consent for Audio recordings.....	84
<b>Appendix D:</b> Permission letter from T.B. Hospital.....	85
<b>Appendix E:</b> Ethics approval letter from CPUT.....	86
<b>Appendix F:</b> Ethics approval letter from EHHRRB.....	87
<b>Appendix G:</b> Permission letter from Mbabane Hospital Laboratory.....	88
<b>Appendix H:</b> Confidentiality agreement from the data transcriber.....	89
<b>Appendix I:</b> Examples of transcribed focus group interviews.....	90
<b>Appendix J:</b> Example of Field notes.....	97

# CHAPTER 1: INTRODUCTION

## 1.0 INTRODUCTION

The intention underlying this study was to explore and describe the lived experiences of diagnostic radiographers working in the public health sector of Eswatini. A lived experience is defined by Given (2008:172) as the representation and understanding of a research participant's experiences, choices and options, and understanding how these factors influence one's perception of knowledge. Van Manen (2017:775) describes phenomenology as the study of how things appear, show or give themselves in lived experience or in consciousness. In this chapter, the background to the study, problem statement, research question, objectives of the study, significance of the study and overview of methodology will be discussed.

### 1.1. Background

Diagnostic radiographers comprise an important part of the multidisciplinary medical imaging discipline. Radiography is a highly technological and scientific profession that is significantly affected by changes in technology and communication (McCall, 2010:2). Principal responsibilities include the appropriate use of technology and care for the patients within the radiology department (Society of Radiographers, 2019). It requires a knowledgeable expert to ensure good image quality and ultimately, patient satisfaction (Almalki *et al.*, 2018:639).

Globally, to practise as a diagnostic radiographer, one has to be registered with the Health Professions Council (HPC) of that particular country upon successfully completing an HPC-approved radiography training programme at either undergraduate or post-graduate level (Society of Radiographers, 2019). Changes in the radiographic profession globally have led to the expanding of role margins for radiographers (Cowling, 2008:28). According to Cowling (2008:28), factors such as skill shortages, cost suppression, need for quality improvement, technological improvement, new medical interventions, new health sector programmes and health sector transformations are driving these role changes everywhere.

A study by Britton *et al.*, (2017:29, 32) concerning the lived experiences of radiographers in Gauteng, South Africa, concluded that radiographers are devoted to patient attention and value close interpersonal connections in their work surroundings. Similar to previous studies (Britton *et al.*, 2017; Khoza *et al.*, 2018; Thambura & Amusa, 2016) radiographers experience professional stagnation and feel that they are not adequately compensated. Britton *et al.*,

(2017:30) and Khoza *et al.*, (2018:29) both agree that remuneration, working conditions, professional support and career development are the main factors having a large effect on radiographers' work experiences. Decker (2009:72), in the United Kingdom, reflected that radiographers thought their training was fit for purpose; however, the habitual attitude of 'getting on with it' as a survival strategy was prevalent in the profession. Lau (2007:1) contends that the volume and complexity of work are gradually increasing yet the supply of a professional labour force is not growing sufficiently to meet this increasing demand in radiography. Thompson and Henwood (2016:93) studied the lived experiences of radiographers in Australia transitioning from clinical to managerial roles and found that a lack of or poorly defined job descriptions resulted in radiographers who are in dual clinical and managerial roles. This renders them unable to manage autonomously in their role and results in role obscurity and conflict (Thompson & Henwood, 2016:93).

The Eswatini government is directing its strategic action plan towards the attainment of Vision 2022. This is a vision of the country's leadership focussing on the attainment of the millennium development goals. This includes the attainment of the United Nations sustainable development goals by the government sector and the rest of the country's entities. It is coined Vision 2022, meaning ambition towards the attainment of a first-world status by the year 2022. The government has developed a customised definition of First World Status and Vision 2022, which claims: "A first world country is one where all citizens are able to sustainably pursue their life goals and enjoy lives of value and dignity in a safe and secure environment. This implies equitable access to sufficient resources, education, health, food security and quality infrastructure and services, as well as good governance" (Eswatini. Ministry of Health, 2014:3). The study emanated from the activities/projects taken by government to attain the first world status. One of activities was to adopt and implement the ISO 9001 standard to improve the quality of service delivery. However, in order for this standard to be implemented it is important to fully understand all of the departments that will be affected by these changes and how they operate within the country. One such department is the radiography department.

Universally, first-world means that laws are in place, there is a high standard of living and there is uninhibited accessibility to modern resources and infrastructure (Kenton, 2019). It is in this regard that the Ministry of Health is striving to adopt and implement the International Organization for Standardization (ISO) 9001 standard. However, the implementation of this standard is confronted with challenges in the medical imaging services for the public health sector of Eswatini. Within the context of Eswatini, the researcher has observed that there is no clear representation of radiographers at senior managerial positions for policy formulation and implementation. There is no proper or well documented organizational structure for the

radiographers. Basically there is no one officially leading the radiography professionals in the public sector, there is only one radiographer who is volunteering to represent radiographers. Radiographers report to a Medical officer at facility level and at ministerial level. Sometimes decisions are taken by the leading medical officers for radiographers resulting in conflicting understandings with the radiographers' knowledge in certain instances. There is no specific regulatory body for allied health professions which would better understand the operations and structures of these professions (i.e. issues of radiation protection to self and others, documenting of the scope of practice

According to the International Society of Radiographers and Radiologic Technologists (ISRRT), radiographers must develop and maintain appropriate knowledge of key components of the laws and regulations that affect their patients and practices through the code of ethics (ISRRT, 2020). Radiographers are responsible to be aware of and comply with the laws, regulations, standards and codes that govern radiographic practice in the applicable dominion (ISRRT, 2020). In Eswatini, there is no regulatory body to licence and authorise practices. The only available health profession council is the Eswatini Medical and Dental Council which focuses primarily on medical doctors. The rest of the allied health professionals only pay annual subscriptions for practice certificates without any representation amongst the council members or organisation of activities for the development of the professions. According to Luntsi *et al.*, (2015:7), radiographers are aware of the challenges faced by the profession and the need for increased effort by the regulatory body towards mitigating the persistent challenges faced by the profession over the years. Additionally, without regulatory body in Eswatini, there is no reporting of radiographs by a radiologist in the public sector; rather, the interpretation of radiographs is undertaken by the referring physician.

Literature reveals that the phenomenon of lived experiences amongst radiographers has not been widely explored in Africa. Studies conducted in South Africa confirm that while radiographers love their jobs, concerns of professional recognition, career development, remuneration and unaccredited role expansion are the main experiences encountered by most radiographers in their work environment (Britton *et al.*, 2017:30, 31; Khoza *et al.*, 2018:29). There is a gap in literature on lived experiences of Eswatini radiographers. Therefore, this study was aimed at gaining an understanding of what it means to be a diagnostic radiographer working in the public health sector in Eswatini. Moreover, the results of this study assisted in the development of guidelines to support the radiography profession within the country. It is anticipated that these guidelines can be shared with the task team for Vision 2022 to better understand and support the radiography profession.

## **1.2 Problem statement**

Restrictions have been placed on the scope of practice for radiographers – by regulatory bodies and educational institutions – to perform within stipulated practice standards globally (Society of Radiographers, 2019). However, based on researcher observation, Eswatini radiographers are expected to perform examinations that fall outside their scope of practice. These include barium studies which are performed without fluoroscopy and monitoring by radiologist, together with hysterosalpingogram examinations. Furthermore, the expanded scope of practice is perceived as part and parcel of the core duties and responsibilities of radiographers. In Eswatini, recognition of the radiography profession is minimal if acknowledgment occurs at all.

According to the Stanford Encyclopaedia of Philosophy (2016:1), life experiences are reflections of an individual's image. These experiences can either facilitate, inhibit or enhance a positive attitude towards one's usual environment with consciousness or awareness (Britton *et al.*, 2017:29). Although other studies have explored the lived experiences of radiographers in some countries, no one has explored this phenomenon in Eswatini. This study aimed to understand the challenges faced by diagnostic radiographers in the country of Eswatini with evidence based data so that the above mentioned challenges can possibly be shared with stakeholders. Stakeholders include Ministry of Health, Ministry of Public service and the Medical and Dental council of Eswatini, together with interested parties like WHO, who are supporting the country in a majority of projects. This understanding provided the foundation for the development of guidelines to support these radiographers when practising.

## **1.3 Research question**

The research question that emanated from the background and problem statement was as follows: *What are the lived experiences of diagnostic radiographers working in the public health sector of Eswatini?*

## **1.4. Aim and objectives**

The aim of this phenomenological study was to gain an understanding of what it means to be a diagnostic radiographer working in the public health sector in Eswatini, in order to develop guidelines to support and enhance diagnostic radiography practice.

The research objectives related to the study were as follows:



- to explore and describe the lived experiences of radiographers working in the public health sector in Eswatini; and
- to develop practical guidelines which support diagnostic radiographers in the public health sector in Eswatini.

## **1.5 Overview of methodology**

A qualitative, exploratory and descriptive phenomenological design was used to understand what it means to be a diagnostic radiographer working in Eswatini. In phase 1 of this study, the researcher sought to understand, explore and describe the lived experiences of practising diagnostic radiographers working in the public health sector of Eswatini. This occurred through focus group interviews to give participants the opportunity to share their experiences with others (Holloway & Wheeler, 2010:126). The phenomenological method was employed through focus group interviews allowing for information rich data to be obtained. The researcher also applied bracketing through field notes and carefully documenting participants' views and various forms of body language that were noted during interviews so that their own opinions would not influence the data (Holloway & Wheeler, 2010:131). Additionally, the researcher used reflexivity to document her own feelings and opinions through documentation of reflective field notes. Development and description of guidelines to promote diagnostic radiography practice in Eswatini was undertaken in phase 2 of the study by inductive reasoning. A detailed discussion of the methodology will be provided in chapter 2.

### **1.5.1 Research population and sample**

The study sample included 18 diagnostic radiographers with formal training in diagnostic radiography working in the public health sector in Eswatini. Diagnostic radiographers were invited to participate in this study through purposive sampling to ensure information rich data was obtained (Holloway & Wheeler, 2010:137; Ross, 2012:100).

### **1.5.2 Data collection**

The three methodologies of data collection that are commonly used in qualitative research are ethnography, grounded theory and phenomenology (Sutton & Austin, 2015:226). This study utilised the phenomenology approach through interactions in the form of focus group interviews to explore the research phenomenon. Radiographers were provided with an information letter prior to the interview date and signed a consent form to participate in the study. Data collection took place in a neutral venue away from their workplaces, in the form of focus group interviews of three to six participants per group. These occurred in a boardroom after requesting

permission to use this space. To meet participant needs for transport expenses, some were interviewed at a boardroom in one of the hospitals; however, this venue was away from the radiology department. The participants were invited in their personal capacity and their participation was during their off days at a time that was convenient for them. A central question was posed:

*What does it feel like to be a radiographer working in the public sector of Eswatini?*

Probing questions and paraphrasing were used to ensure a true understanding of the participants' stories. These focus group interviews were audio recorded, with field notes taken to ensure rich contexts persist beyond the original research through additional information on body language and observed conversations. Documentation of participant gestures, expressions and behaviours during group discussions was undertaken. Interviews lasted until no further stories were shared. The researcher acquired the skill of conducting focus group interviews through supervisor guidance/coaching and extensive literature research. Field notes are attached in appendices. They are presented in the following headings; logistics, observational notes, personal notes, methodological notes and theoretical notes.

### **1.5.3 Data analysis**

Data was transcribed verbatim and thematically analysed. Thematic analysis in this context refers to a process of converting qualitative information into a list of implicit themes: composite classic themes, indicators and experiences that are causally correlated (Braun & Clarke, 2006:79; Clarke & Braun, 2016:2; Holloway & Wheeler, 2010:282). A theme is a pattern found in information that, at the slightest, described possible observations or, at the extreme, interpreted aspects of the phenomenon. For the purposes of this study, the process of analysis by Holloway and Wheeler (2010:282) was utilised. This process involved transcribing interviews, sorting field notes, categorising, collation and arranging data, and repeatedly listening to and reading or viewing the gathered data (Holloway & Wheeler, 2010:282). Other stages include coding and categorising, and finally, building themes to describe the phenomenon in question (Holloway & Wheeler, 2010:282).

### **1.5.4 Trustworthiness**

For this study, trustworthiness was ensured by applying the four principles introduced by Guba and Lincoln (1989): credibility, dependability, transferability and confirmability (Gunawan, 2015:10; Nowell *et al.*, 2017:4; Korstjens & Moser, 2018:121). To ensure credibility in this study, prolonged engagement, persistent observation, triangulation of data and member check

were employed. In this study, a detailed description of the methods section will be provided as well as audit trails established to ensure dependability. To enable the reader to assess whether the research findings are transferable to other settings, also referred to as transferability judgement, in-depth description of the research setting and data population will be presented. Shenton (2004:63) concludes that the results of a qualitative study must be understood within the context of the particular features of the institution or associations and, possibly, the geographic area in which the survey was carried out. Additionally, summaries and verbatim quotes will be provided. According to Nowell *et al.*, (2017:3), confirmability is concerned with establishing that the researcher's understanding and judgements are clearly derived from the data, requiring the researcher to demonstrate how conclusions and interpretations have been reached. Therefore, in this study, confirmability was confirmed with a confirmability audit, a submission of audio recordings, transcriptions and field notes of study findings.

### **1.5.5 Ethical considerations**

Permission to undertake the study was requested from the Cape Peninsula University of Technology, Faculty of Health and Wellness Sciences Research Ethics Committee, CPUT/HW-REC 2020/H14, and Eswatini Human Health Research Review Board SHR270/2020 (Appendices E & F). For the purposes of this study, four fundamental ethical principles were adhered to. These are beneficence, non-maleficence, justice and autonomy (Boyd, 2003:482). According to Boyd (2003:482) and Copete and Hernandez (2012: 331), together with Cacciattolo (2015:55), a researcher should make sure that participants are safe from harm and protected from unnecessary anxiety at all times. Goodman *et al.*, (2003:53) define non-maleficence as refraining from actions that inflict harm. There were no direct benefits nor any harm to the participants from this study. Justice in relation to research give emphasis to the opportunity to participate in a study, but a sense of balance must be found with the specific topic of the research, the support that person receives, and the weight of that person's participation (Copete & Hernandez, 2012: 331). All participants were invited in their own capacity and participation was completely voluntarily. Each participant received a full description of the study by means of an information letter (Appendix A). According to Sanjari *et al.*, (2014:5), autonomy is concerned with obscurity, privacy, informed consent, researchers' potential power over participants, and vice versa. In this study, participants were asked to sign a consent for participation and for the audio recordings of the interviews. Participants were informed that they can withdraw from participation at any time; however, data collected until the time of withdrawal will be retained by the researcher since no names were used during the focus group interviews. No one withdrew from the study.

## **1.6 Conclusion**

This chapter has given an overview of the study background, problem statement, research question, significance of the study, and finally, an overview of the methodology. The next chapter will provide an in-depth discussion of the research design and methodology that was followed to achieve the aims and objectives of the study.

## **1.7 Division of chapters**

Chapter 1: Introduction

Chapter 2: Research Design and Methodology

Chapter 3: Discussion of Findings

Chapter 4: Guidelines, Recommendations and Conclusion

## **CHAPTER 2:**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **2.1 Introduction**

The purpose of this research was to explore the lived experiences of diagnostic radiographers working in the public sector in Eswatini. There has been no study to date that has exclusively studied this cluster of professionals. Due to the paucity of research on this specific group, the researcher aimed to tell the participants' stories in their own words. This chapter outlines the research design and methodology chosen by the researcher in trying to understand the research phenomenon, and in doing so, justifying the approach for this study. The method of data collection and analysis will be critically evaluated, and issues of trustworthiness and ethical considerations discussed.

#### **2.2 Research design**

The research design is the type of inquiry within the research approach that establishes an organisation for the population of information (Cresswell & Cresswell, 2018:50). According to Cresswell and Cresswell (2018:44), Mohajan (2018:7) and Cuthbertson *et al.*, (2020:94), the three important components involved in an approach are the philosophical assumptions or the worldviews of the researcher; research design; and the specific methods of data collection, analysis and interpretation. Literature reveals a number of specific qualitative inquiry approaches which include narrative research, phenomenological research, grounded theory, ethnography, case studies and action research (Wertz *et al.*, 2011:4; Ross 2012:88; Merriam & Tisdell, 2015:22). Whilst there are many approaches to qualitative research that the researcher might have employed, the phenomenological approach was selected because of its philosophical underpinnings and methodologies. It utilises the naturalism paradigm by studying people in their natural surroundings to develop a profound understanding of their social reality (Ross, 2012:88; Mohajan, 2018:8). Holloway and Wheeler (2010:14) suggest that for researchers who wish to study a specific phenomenon or the life of participants, a phenomenological approach rendered through interviewing participants is the preferred approach.

##### **2.2.1 Qualitative study**

To understand qualitative research, it is pertinent to know the brief history of the research, its tradition and its philosophical foundations. Qualitative research is described by Holloway and

Wheeler (2010:3) and Ross (2012:89) as a form of social inquiry that focuses on the way people make sense of their experiences and the world in which they live. According to Cresswell and Cresswell (2018:46), qualitative research is supported by a social constructivist worldview. The researcher interprets the meaning others have about the world by seeking to understand the sphere in which they live and work (process) to understand the historical and cultural setting of participants. It addresses the process of interrelations (inductive) among individuals by focussing on the specific contexts (richly descriptive) in which individuals or groups attribute to a collective or social problem (Merriam & Tisdell, 2015:15). It helps develop an understanding of human experiences through knowledge gained and insight about human beings, be they patients, colleagues or other professionals.

Furthermore the researcher is the principal gadget of data collection and analysis (Merriam & Tisdell, 2015:15). Sample group in qualitative research is typically non-random and small, meaning it is purposeful (Ross, 2012:100). The investigator regularly spends time in the field of study, repeatedly in contact with participants. The researcher must immerse him or herself in the natural setting of the participants whose activities and feelings are to be explored, thereby adopting an understanding to the research context (Holloway & Wheeler, 2010:4). The qualitative research approach was suitable for this study as it involves the description of the lived experience of human beings (Holloway & Wheeler, 2010:3). Based on these principles of qualitative research design, the researcher deemed this to be the appropriate design of choice for this study.

### **2.2.2 Phenomenology**

According to Merriam and Tisdell (2015:9) and Holloway and Wheeler (2010:89) phenomenology was initially developed by Edmund Husserl and Alfred Schutz early in the twentieth century as a major orientation to social science. Wertz *et al.*, (2016:52) explain that Husserl held the view that by virtue of their capacity for consciousness, humans are basically different from physical material and therefore require methods other than those developed by the physical sciences to be scientifically examined. He studied how people describe things and understanding them through their minds using phenomenology. Husserl's basic philosophical hypothesis was that we can only ascertain what we experience by attending to perceptions and meanings that wake up our cognisant responsiveness (Patton, in Merriam & Tisdell, 2015:9). Specifically, phenomenology studies the structure of various types of experiences ranging from perception, thought, memory, imagination, reaction, aspiration, and option to physical mindfulness, material achievements and communal actions, including verbal activity (Given, 2008:172; Chandler & Munday, 2016). Likewise, Ross (2012:89), Thompson and

Henwood (2016:90), Cresswell and Cresswell (2018:50) and Mohajan (2018:8) concur that phenomenology strive to describe or understand the fundamental meaning of survived practices of people about a phenomenon as defined by the participants. The researcher sought to describe the lived experiences of diagnostic radiographers working in the public sector in Eswatini.

### **2.2.3 Exploratory studies**

According to Rendle *et al.* (2019:3), exploratory studies approach the topic of study mainly in an inductive style to explore the capabilities of possible enquiry awareness that continue mostly or absolutely unexamined by the scientific world. Basically, exploratory studies aim to generate new knowledge by exploring an innovative topic where minimal or no data exist. Moreover, this type of approach may shift radically as investigators acquire new knowledge about the phenomena in question (Rendle *et al.*, 2019:3). At the time of this study, there was no investigation available on the lived experiences of diagnostic radiographers working in the public sector in Eswatini.

### **2.2. 4 Descriptive studies**

Aggarwal and Ranganathan (2019:34) define descriptive studies as studies that allow the investigator to study and describe the sharing of one or more variables, without regard to any underlying or new concepts. According to Rendle *et al.*, (2019:3), this approach aims to build upon exploratory data by carefully describing the reasoning behind specific context.

Hence a qualitative, exploratory, descriptive design in a phenomenological approach was chosen by the researcher, whereby the lived experiences of diagnostic radiographers working in the public health sector of Eswatini were explored to understand what it means to be a radiographer working in Eswatini. Similarly, Korstjens and Moser (2017:277) insist that qualitative research studies smaller samples in greater depth, striving to minimise manipulation of the normal surroundings and remaining open to unlikely and unpredicted discoveries. Further, the method of qualitative evidence synthesis can provide information to support decision-making in the context of guideline development (Flemming *et al.*, 2018:13).

## **2.3 Research methodology**

Research method is the procedure the researcher followed to gather and scrutinise the data. The data collection process, data analysis, trustworthiness and ethical considerations will be

explained in this section. According to Holloway and Wheeler (2010:21) methodology refers to the philosophies and planning on which investigators base their processes and approaches (methods). Additionally, Holloway and Wheeler (2010:13) remark that methodology and processes depend on the nature and type of research question, the epistemological standing of the researcher, the experiences and understanding of the researcher, skills and training of the researcher and finally, the resources available for the research project.

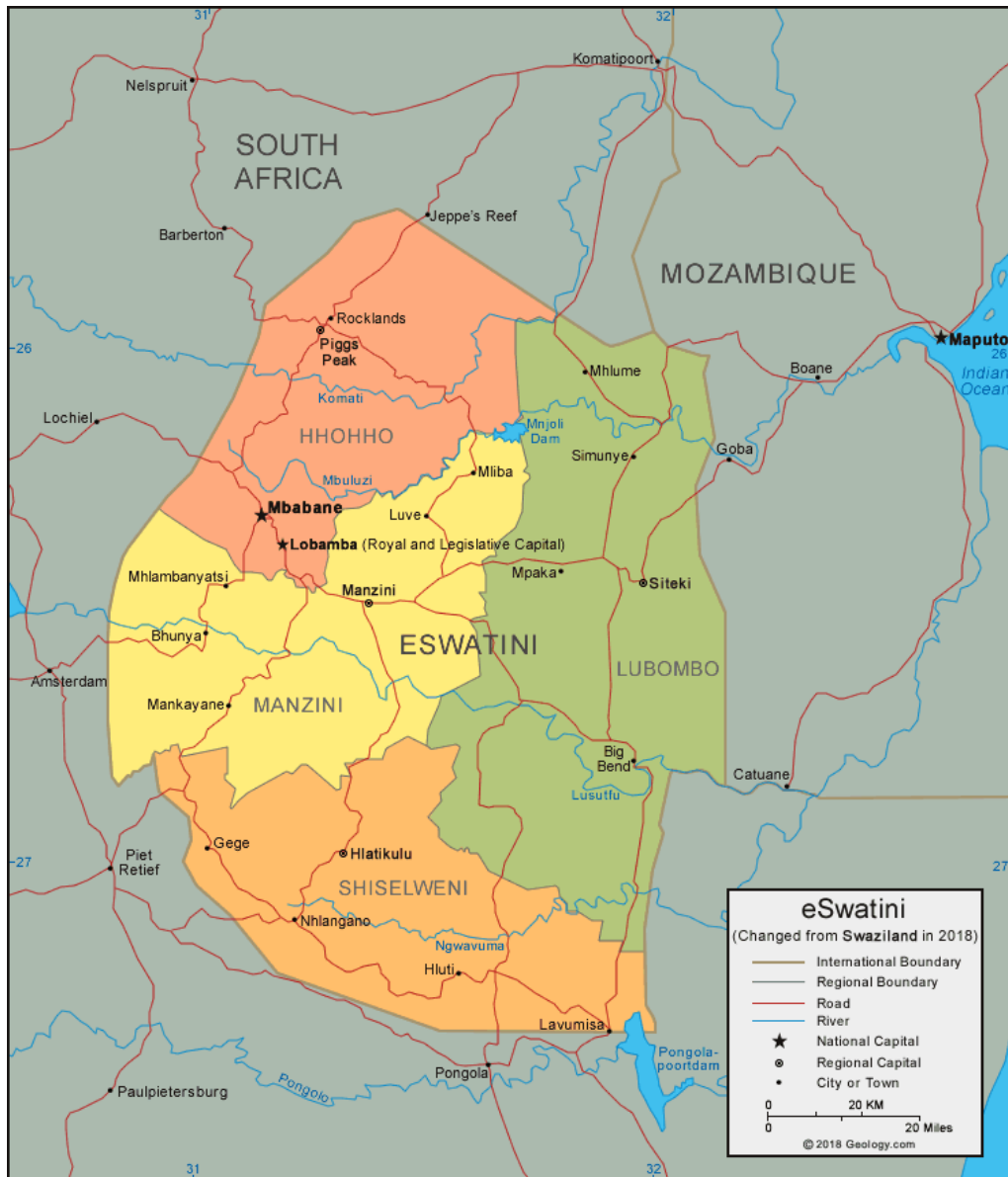
### **2.3.1 Research setting**

In planning this study, it was important to provide details of the context in which it occurred, or in other words, a thick description (Holloway & Wheeler, 2010:4, 7). There are few radiographers in the public health sector of Eswatini, the number was approximately thirty-one (31) when the study was conducted, including four (4) sonographers. These 31 radiographers are dispersed in 12 departments or healthcare facilities namely; regional hospitals (4), health centres (5), specialised clinics (2) and one national referral hospital. The researcher opted to conduct this study with diagnostic radiographers as they form the majority of the medical imaging personnel in the public sector.

The health service provision structure in the country is designed around a four-tier classification of service delivery comprising community clinics and public health units, health centres, regional referral hospitals and national referral hospitals (Eswatini Ministry of Health, NHSSP, 2014:3). The health services are delivered through a decentralised system within the four regions in the country – Hhohho, Manzini, Lubombo and Shiselweni (Figure 2.3.1 below).

All levels of care and all regions were represented in the study, meaning participants were from the lowest level clinic up to the national referral hospital. There is no radiologist in the public health sector of Eswatini. This means diagnostic radiographers work on their own. The overall management and leadership of the public health sector radiology services in Eswatini are organised at the Ministry of Health offices by the directorate office. This office is managed by medical officers who usually engage with an unofficially assigned radiographer for clarity on certain issues pertaining to radiography when the need arises. The public sector radiology staff complement typically consisted of one diagnostic radiographer in a clinic and two diagnostic radiographers in the health centres at the time when this study was conducted. The regional hospitals had either two or three diagnostic radiographers, whilst the only national referral hospital in the country had six diagnostic radiographers. The following map demonstrates the geographical regions and locations of the public healthcare facilities as they are labelled according to the town in which they are located.





**Figure 2.3.1. Map depicting Eswatini geographical regions and towns to present geographical locations of public healthcare facilities with radiology departments (<https://geology.com/world/swaziland-satellite-image.shtml>)**

### 2.3.2 Research population sampling

The population included all the diagnostic radiographers who have a formal training in diagnostic radiography, working in the public health sector in Eswatini. Diagnostic radiographers were invited to participate in this study through purposive sampling to ensure information-rich data is obtained (Holloway & Wheeler 2010:125). According to literature, purposive sampling may progress into theoretical selection, which involves selecting participants or data sources that will add value to the developing philosophy (Jeanfreau & Jack, 2010:4).

A total of 20 diagnostic radiographers working in the various public healthcare centres were invited to participate in the study, of which 18 consented by an affirmative response. Focus group interviews were conducted in the proposed neutral venue or a neutral venue that was identified by participants for ease of access. Only invited participants were present in the venue and each participants would talk after one has finished sharing his/her experiences. Table 2.3.2 demonstrates the research population demographics for each focus group interview.

**Table 2.3.2. Focus group interview demographics.**

<b>Group no:</b>	<b>No: of participants</b>	<b>No: of males and females</b>	<b>Duration of interview in minutes</b>	<b>Work experience ranges in years</b>
1	6	3 males 3 females	63:01 minutes	1 -18 years
2	5	4 males 1 female	34:34 minutes	2 – 18 years
3	3	0 males 3 females	28:31 minutes	10 -20 years
4	4	3 males 1 female	50:18 minutes	2- 25+ years

### **2.3.2.1 Eligibility criteria**

All diagnostic radiographers meeting the inclusion criteria were included in this study. There were approximately 25 permanently employed diagnostic radiographers working in the public health sector in Eswatini, with differing years of clinical experience ranging from one year to more than 20 years.

### **2.3.2.2 Inclusion criteria**

All practising diagnostic radiographers with a formal diagnostic radiography qualification, working in the public health sector of Eswatini, were invited in their personal capacity to participate in the study.

### **2.3.2.3 Exclusion criteria**

All recently employed diagnostic radiographers (of less than a year) were excluded from the study. These were on contract/temporary employment and have just recently joined the public sector when the study was undertaken. All sonographers in the public sector were also excluded in the study even though they were qualified in diagnostic radiography and occasionally practise diagnostic radiography. Due to the qualitative nature of the study, we

aimed to focus and understand a single population within a specific context. The sonographers might have different experiences based on the context of a sonography environment.

## **2.4 Data collection**

This study utilised the phenomenological design methodology, as this method uses face-to-face interviews and interactions such as focus groups to explore a specific research phenomenon which may help in illuminating a difficult, situation or environment (Sutton & Austin 2015:226). In this study the researcher endeavoured to explore, understand, and describe the lived experiences of practising diagnostic radiographers in the public health sector of Eswatini. This exploration occurred through focus group interviews to allow participants the opportunity to share their experiences with others. This setting allowed for information rich data to be obtained. Radiographers were provided with an information letter (Appendix A) via email or WhatsApp messages, and follow-up communication to verify acceptance for participation was through a phone call. On the day of the interviews, participants were requested to sign a consent form for participation in the study and to consent to audio recordings after requesting permission to do so (Appendix B& C).

Data collection took place in a neutral environment, in the form of focus group interviews. There were varied number of participants. The number of participants per group was dependant on their availability (off duty) during the interview day and proximity to the venue. These interviews were planned to be conducted in a boardroom in one of the hospitals after requesting permission to do so (Appendix D). All participants were invited in their personal capacity. The participation did not affect their work schedules as they were participating during their off days or outside of working hours at a time that was convenient for them. Only two groups were interviewed at the research venue as proposed; participants preferred this venue since it was closer to their home areas and located in the central part of the country. However, for some of the participants to avoid incurring transport costs to the research venue, the researcher opted to request a boardroom within one of the hospitals. Participants who were in the same hospital were requested to conduct the interview at their hospital boardroom which was away from the radiology department after normal working hours. This was also the most convenient central venue for two other participants who were off duty, as the venue was close to their homes. Permission to use this venue was requested and granted (Appendix G).

The final group interview was conducted after working hours in an office adjacent to the patients' waiting area near the pharmacy department, therefore enduring some background noise. This venue was suggested by the head of the radiology department in one of the hospitals as it allowed the participant from the closest health centre to combine with this group.

Also, this arrangement deviated from the proposed venue for the participants not to incur transport costs as the researcher opted to drive to the meeting venue.

The Eswatini stipulated COVID-19 regulations during the time of the interviews were adhered to; that is, social distancing of at least one metre between individuals and not more than 20 persons in a closed area (Eswatini Government, Disaster Management Coronavirus Regulations, 2020:5). Interviews lasted between 28 minutes to an hour and were audio recorded.

Notably, at the beginning of each group interview, nervousness was apparent, but soon participants would relax as the purpose of the interview was introduced and detached from the researcher's organisational position. All participants expressed happiness to be invited to participate in the study, as noted by their facial expressions and gestures. They also revealed excitement for an opportunity to share their experiences. Interaction between participants was easy as most of them either studied together or were employed in the public sector in groups from the same class. Confidentiality cannot be guaranteed during focus group discussions, however the researcher encouraged all participants to keep all discussions from the interview as private and confidential.

A central question was posed:

*What does it feel like to be a radiographer working in the public sector of Eswatini?*

Probing questions and paraphrasing were used to ensure a true understanding of the participants' stories. The researcher also applied bracketing, so that her own opinion would not influence the data. According to Dörfler and Stierand (2020:2), "bracketing is a method used in qualitative research to mitigate the potentially deleterious effects of preconceptions that may taint the research process". The researcher attempts to suspend her pre-understanding and assumptions to attain experiences before making sense of them (Ross, 2012:90). Bracketing was used to abridge the possibility of researcher preconceptions affecting the data (Tufford & Newman 2012:80; Thompson & Henwood, 2016:90).

Field notes were taken to increase the degree of validity (triangulation of data). According to Holloway and Wheeler (2010:275), "Triangulation is the process by which several methods (data sources, theories or researchers) are used in the study of one phenomenon in order to ensure validity in a study". After each focus group interview, field notes were written up (Appendix J). Interviews were conducted until no new stories were told and data saturation was achieved. The stories shared were similar in all focus group interviews. The stories from the fourth (last) focus group interview demonstrated that data saturation has been reached as they were similar to the first three group interviews.

All interviews were recorded using a digital voice recorder (a cell phone recorder was used as a backup) and were transcribed verbatim following each interview. The front sheet of the transcripts contains the focus group number, interview date and minute length of the audio, the name of the transcriber as well as the coding or pseudonym for the participant and researcher (no identifier), and all pages are numbered (Appendix I).

## **2.5 Data analysis**

Data was thematically analysed. According to Braun and Clarke (2013), this method is preferred by novice qualitative researchers because of its flexibility in terms of research question, procedures of data collection, sample size and composition, and styles to meaning generation. Thematic analysis in this context refers to a process of categorising, evaluating and interpreting patterns of meanings within the qualitative data (Clarke & Braun, 2016). For the purposes of this study, the process of analysis by Holloway and Wheeler (2010:282) was utilised. This process involves the following steps: transcribing interviews and categorising field notes, classifying, collation and storing the data, listening to and reading or inspecting the material together repetitively. Ultimately, this means immersion in and engagement with the data (Holloway & Wheeler, 2010:282). The audio files were given to a transcriber for verbatim transcription of the interviews. This was done in order to create quality transcripts of the audio recordings by a professional transcriber. The researcher felt a transcriber would be appropriate to transcribe the audio recordings as he/she has experience in the process. However the researcher checked the transcripts against the audio recordings for correctness. The data transcriber was requested to sign a confidentiality agreement (Appendix H). Field notes were written up by the researcher directly after each focus group interview. Saturation was reached when no new information emerged from the participants' stories. The transcripts, audio recordings and field notes were analysed together, resulting in data-triangulation.

The next step involves organising, collation and categorisation of data. In order to do this, the researcher listened to the audio-recordings and read entire transcripts for correctness. All sets of field notes were organised in the same way: 1) a description of logistics; 2) observational notes; 3) personal notes; 4) methodological notes; and 5) theoretical notes. To gain the meaning of the data, the researcher read the transcripts and listened to the audio recordings several times. The researcher went through this process for all four transcripts and audio recordings from focus group interviews.

Other stages include coding and categorising, construction of themes and finally, unfolding the phenomenon in question (Holloway & Wheeler, 2010:282; Scharp & Sanders, 2018; Braun & Clarke, 2013). Through the repeated reading of transcripts and field notes, the researcher identified important codes and collected a series of brief quotes which served as a representation of participants' thoughts concerning the phenomena under study. The researcher created summaries of the participants' stories by breaking the data down line by line and identifying relevant words or phrases which were sorted into groups (Ross, 2012:116). Subsequent to this process, the researcher combined similar concepts to generate a category. Final themes and categories were developed based on the concepts. Inductive and deductive reasoning was applied to analyse the data (Cresswell & Cresswell, 2018:257-258). After identifying the themes and categories, supporting verbatim quotes were extracted from the data. When this process of data analysis was complete, final names for the themes and categories were developed. The findings reflected four themes describing the lived experiences of diagnostic radiographers working in the public health sector in Eswatini.

## **2.6 Trustworthiness**

To ensure reliability of the study, the four principles of trustworthiness – credibility, dependability, transferability and confirmability – were ensured (Shenton, 2004:64; Gunawan, 2015:10; Nowell *et al.*, 2017:3).

### **2.6.1 Credibility**

According to Shenton (2004:65) and Guba and Lincoln (1989), in Nowell *et al.*, (2017:3), the credibility of a study is determined when co-researchers or readers can recognise the experiences with which they are stimulated. Muhammad *et al.* (2008:43) and Korstjens and Moser (2018:123) maintain that credibility establishes whether the research findings denote acceptable information drawn from the participants' unique data which serves as a correct interpretation of the participants' original views. Nowell *et al.*, (2017:11) describes "member checking, as a final step, that allows the researcher to establish the acceptance between participants' views and the researcher's representation of them". To ensure credibility, triangulation of data and member checking through paraphrasing and summarising participants' stories after each interview session was employed during this study. Presentation of study findings were shared with the participants after the final analysis of data was completed.

### **2.6.2 Dependability**

According to Muhammad *et al.*, (2008:43), Nowell *et al.*, (2017:3) and Korstjens and Moser (2018:123), dependability involves participants' appraisal of the findings, justification and recommendations of the study such that all are supported by the data as received from study participants. In this study, a detailed description of the methods section was provided. Bracketing was used to reduce the possibility of researcher's bias tainting the data and an audit trail of field notes increased the degree of dependability of data analysis.

### **2.6.3 Transferability**

Nowell *et al.*, (2017:3) and Korstjens and Moser (2018:123) describe transferability as the degree to which the results of qualitative research can be transferred to comparable contexts or settings with other participants. According to Shenton (2004:69), results of a qualitative study must be understood within the context of the particular characteristics of the group or organisations and, possibly, the geographic region in which the research was carried out. Hence in this study, summaries and verbatim quotes will be provided in the results and discussion section. Additionally, in-depth description of the research setting and data population is presented.

### **2.6.4 Confirmability**

Nowell *et al.*, (2017:3) define confirmability as concerned with establishing that the interpretations and findings of a research study are a true reflection from the data set. This requires the researcher to demonstrate how conclusions and interpretations have been reached. Likewise, Johnson *et al.*, (2020:142) mention that the researcher ensures and connects the reader to the results based on the replication of the information gathered from the participants and not the understanding or bias of the researcher. To achieve confirmability that findings emerged from the data, a confirmability audit through the submission of audio recordings, transcribed focus group interviews and field notes of study findings will be provided.

## **2.7 Ethical considerations**

Permission to undertake the study was granted by the Cape Peninsula University of Technology, Faculty of Health and Wellness Sciences Research Ethics Committee (Appendix E) and Eswatini Health and Human Research Review Board (Appendix F). For the purposes of this study, the four fundamental ethical principles were adhered to: beneficence, non-maleficence, justice and autonomy (Boyd, 2003:482; Malone & Zolzer, 2016:2).

### **2.7.1 Beneficence and non-maleficence**

According to Boyd (2003:482), Holloway and Wheeler (2010:68) and Copete and Hernandez (2012: 331), beneficence refers to the ability to maximise benefits and minimise injury, whilst non-maleficence is defined as refraining from actions that inflict harm. Cacciattolo (2015:55) expresses that the researcher should ensure that participants are safe from harm and are protected from unnecessary stress at all times. For the purposes of this study, participants were provided with psychologist contacts in the information letter to consult in case they felt the need for post-participation counselling (Appendix A). The researcher requested permission to use the most convenient interview venue or requested participants to participate at a neutral venue that would be convenient and close. The researcher would drive to the selected venue if necessary. There were no direct benefits nor any harm to the participants (Flemming & Zegwaard, 2018:211).

### **2.7.2 Justice**

According to Copete and Hernandez (2012:331), “justice in relation to research emphasises the opportunity to participate in an investigation, but a balance must be found with who the individual who is subject to research is, what benefits that person receives, and what is the weight of that person’s participation”. In other words, the principle of justice addresses the questions of who should benefit from the research and who should carry its burden (Flemming & Zegwaard, 2018:211). While the researcher invited all eligible participants to participate in the study, some declined due to other commitments. The researcher also drove to the preferred venues as suggested by the participants to afford any opportunity for all eligible participants to partake without incurring transport costs to the initially proposed research venue.

### **2.7.3 Autonomy**

Holloway and Wheeler (2010:68-69) and Sanjari *et al.*, (2014:5) designate autonomy as privacy, concealment, informed consent, researchers’ possible influence on the participants and vice versa. According to Copete and Hernandez (2012:331), this principle allows the individual to enter willingly into the research and involves unlimited respect and accountability on the part of the researcher.

Participation in this study was entirely voluntary. Each participant received a full description of the study by means of an information letter (Appendix A). Participants were asked to sign a consent for participation and for audio recording (Appendix B & C). Participants were informed



about withdrawing from participation in the study at any time; however, data collected until the time of withdrawal would be retained by the researcher since no names were identified during the focus group interviews. An independent transcriber was utilised and anonymity was maintained by a confidentiality agreement (Appendix H). Participants were informed that results of the study will be published anonymously and all respondents' satisfaction, queries and concerns will be documented.

## **2.8 Summary**

This chapter has provided a detailed description of the research design and methodology that was utilised during this study. The approach refers to the philosophies and principles that distinguishes the type of theoretical worldview or assumptions the researcher brings to the study. The application of the various aspects relating to the methodology was elaborated upon. The subsequent chapter presents an extensive discussion of results and a presentation of findings.

## **CHAPTER 3:**

### **PRESENTATION AND DISCUSSION OF FINDINGS**

#### **3.1 Introduction**

In this chapter, the research findings are presented and discussed according to the data obtained from in-depth focus group interviews and reflective notes. This chapter primarily focuses on the first objective of the study:

- to explore the lived experiences of diagnostic radiographers working in the public sector in Eswatini.

The study was conducted through focus group interviews amongst diagnostic radiographers working in the different public healthcare facilities in Eswatini. Data was collected through audio recordings and documenting of field notes. An independent transcriber transcribed all audio recordings verbatim. Themes and categories subsequently emerged from the data. In this chapter, verbatim quotes are provided to support the themes and categories. The data was conceptualised using studies from other medical imaging disciplines such as radiotherapists and other healthcare professions.

#### **3.2 Demographics of the study sample**

The sample participants were eighteen in total (n=18) from throughout the country's regions, representing most healthcare levels in the public sector with radiology departments. Six (6) participants were from the Hhohho region, consisting of participants from the main referral hospital in the country, one regional referral hospital and one health centre. Five (5) participants were from the Shiselweni region representing the regional referral hospital and one health centre in the area. Another group consisted of three (3) participants representing Manzini and Lubombo regional referral hospitals and a health centre. The last group consisted of four (4) participants from Manzini, Lubombo and Hhohho regional hospitals and a specialised clinic.

The participants had differing years of work experience ranging from a year (1) to above twenty (20) years. The groups were slightly dominated by male diagnostic radiographers with a total number of 10 out of 18 participants being male. Interview coding was presented as a focus group number (FG1, for example), and participants were denoted with an (I) plus a number (I2) meaning interviewee number.

### 3.3 Description and discussion of findings

Four themes emerged from the data set, namely challenging work environment, council constraints, lack of professional autonomy and a sense of professional pride. Each theme was given an in-depth description through categories. A summary of the themes and categories emerging from the data set is presented in Table 3.3.

**Table 3.3 Themes and categories**

Themes	Categories
1. Challenging work environment	1.1 Lack of resources and consumables 1.2 Shortage of radiographers 1.3 Absence of radiologists 1.4 Lack of proper radiation monitoring and safety 1.5 Poor remuneration 1.6 Stagnant professional growth
2. Council constraints	2.1 Poor representation 2.2 Scope of practice of radiographers 2.3 Improper or absence of guiding documents
3. Lack of professional autonomy	3.1 Radiographers have no power 3.2 Not well-recognised 3.3 No appreciation 3.4 Not involved in the decision-making process
4. A sense of professional pride	4.1 Love for the profession 4.2 Making a difference to patients' lives 4.3 Good working experience

The discussion of themes and categories that emerged from the study data will also incorporate some literature based on the shared perceptions or experiences of the participants. Vaismoradi *et al.*, (2016:107), Scharp and Sanders (2018:1) and Xu and Zammit (2020) define theme as an explicit pattern that captures a pertinent characteristic of the data in a patterned method that answers the research question in a significant system. Transcripts were reviewed for accuracy and completeness, and identifying information was removed or abbreviated.

#### 3.3.1 THEME 1: Challenging work environment

The first theme to emerge from the data set reflected a challenging work environment. The participants shared stories of a challenging environment due to a lack of radiography supplies and shortage of personnel. They also highlighted concerns over a lack of effective radiation monitoring and safety for both staff and patients. While they expressed a love for their profession, they also felt that remuneration for the work performed was crucial. In addition, the participants thought that the radiography profession in the country was burdened with

stagnation. Moreover, participants admitted feelings of occupational stress and burnout as a result of a shortage of radiographers and daily commodities such as X-ray film.

The researcher can relate to this challenging work environment as she has experienced work overload and the constriction of working with limited resources. The challenges experienced within the working environment that the participants expressed are explained in the following categories.

### **3.3.1.1 Category 1: Lack of resources**

In this category, participants shared feelings of concern and frustration over the lack of resources within their work environments. Many conveyed stories of not having adequate radiology equipment, consumables, stationery and x-ray film in their respective hospitals. Lack of consumables in the form of x-ray films was a significant challenge in the radiography departments. Furthermore, participants expressed that limited imaging resources such as the different imaging modalities in the public sector limit the radiographers' role in the delivery of healthcare services. These stories are reflected in the following verbatim quotes:

*FG1 I2: And those I wanted to raise, sometimes you do face challenges whereby you go to the pharmacy to get something, and then you find they are out of stock and it's taking a long time for them to bring. Like in the case of X-ray films.*

*FG 3 I3: Then another thing is the issue of limited resources in practice. I will concur with the previous speaker. We don't have resources. Our hospitals don't have CT scans, and our hospitals don't have fluoroscopy. We use conventional radiography for fluoroscopy. So that's limitations we have in the country.*

*FG 4 I1: The problem that we're facing is that you know, not everything can be done in the facility to say, and at the same time, we are limited to a certain number of, to a certain number of I say, examinations and the like.*

*FG 2 I1: And also, what I noted was that we have a lot of out-of-stock issues that we're dealing with in the department. You find that there are shortages of films, shortage of materials that we are using protective wear is not up to date.*

Eswatini public health radiology departments use computed radiography (CR) with daylight laser printing of hard copy images. A few departments have direct digital radiography linked to a daylight laser printer, as there is no Picture Archiving Communication System (PACS) or Digital Imaging Communication system (DICOM) in the public sector. Hence, radiographers in the public sector print hard copy images for the physicians; therefore, the need to have a

consistent supply of x-ray films upon which the doctors can rely is vital to daily operations. Literature indicates that the wide acceptance and adoption of PACS has been considered a reasonable approach to mitigate the challenges faced by imaging departments and hospitals through hard copy films (Mohammad *et al.*, 2020:8, Dhoot *et al.*, 2018:3). PACS has proven to be cost-effective through its multiple advantages of simultaneous access to medical images from distant clinics settings, rapid image examination and archiving, particularly in developing countries (Gupta *et al.*, 2015:66; Tabatabaei *et al.*, 2017:250; Alhajeri & Shah, 2019:64; Mohammad *et al.*, 2020:2). Additionally, Mohammad *et al.*, (2020:8) found that work reorganisation and use of home PACS resulted in a low infection rate and zero mortality during the COVID-19 pandemic in an Egyptian radiology department. Based on the stories shared by the participants, the need for a PACS and DICOM system is evident.

Diagnostic radiology plays a pivotal role in the delivery of modern healthcare services. The World Health Organization (WHO) contends that improving health service coverage and health outcomes hinge on the accessibility, availability and capacity of health and care workers to deliver quality people-centred integrated care (WHO, 2016). Despite this, Ngoya *et al.*, (2016) found that there are only 5.7 general radiography units per million people in Tanzania, three times less than the South African public sector. As these authors explain, this number of radiography units per million people is lower than the 20 units per million people in the public sector recommended by the World Health Organization (Ngoya *et al.*, 2016). Similarly, studies by Maboreke *et al.*, (2019) and Sibanda *et al.*, (2017:9) identified an overall shortage in basic radiological equipment resources and inequitable distribution of existing resources. A survey by the WHO on country baseline medical devices found that there is only one Computerised Tomography Scanner (CT) in the public sector per population of one million in Eswatini (WHO, 2011). This literature is in alignment with the findings from the current study whereby diagnostic radiographers in Eswatini have expressed concern over the lack of radiological equipment within the country.

Mariani *et al.*, (2017:1028) and Dhoot *et al.*, (2018) agree that limited availability of imaging equipment and inadequate maintenance of equipment are major challenges faced by low-income countries. Similarly, an assessment by Frija *et al.*, (2021:2) and Hricak *et al.*, (2021) confirms a substantial shortage of resources in imaging and nuclear medicine in the form of equipment and personnel predominantly in low-income and middle-income countries.

While there are recommendations by the WHO for the ideal distribution of equipment units per population size, there is clear evidence from literature to support the feelings of the diagnostic radiographers in Eswatini. The above data and literature substantiate the challenges faced by

the diagnostic radiographers in Eswatini regarding evident shortage of resources, including technologies.

### **3.3.1.2 Category 2: Shortage of radiographers**

In this category, participants shared feelings of being overworked due to the shortage of radiographers. They have to work long hours due to the limited number of radiographers in the various healthcare and hospital departments. This accelerates occupational stress and burnout. They shared feelings of exhaustion due to them being overwhelmed by the number of patients to be attended to and working extended shifts. The shortage of radiographers was well articulated in the following verbatim quotes:

*FG1 I1: Yes, as I've mentioned, I work long hours so I think if maybe we can have more radiographers, and then the 2<sup>nd</sup> point which I've mentioned, okay, I work long hours secondary to the shortage of radiographers which is secondary to the shortage of radiographers.*

*FG1 I4: Mmm!! I think our department is one of the busiest in the country and for me it's been exhausting being a radiographer because I feel like we see a huge number of patients in our department and the CR machine that we have increases the time that each patient spends in the department.*

*FG3 I3: What I have experienced about working in our public sector is that you interact with people, different people, you find that where you are you services a large population and sometimes because of the workload and the shortage of staff, sometimes develop occupational stress and burnout because of the workload....*

Human resources play a significant role in the delivery of efficient and effective radiographic services. A diagnostic radiographer is a key member of the healthcare team. They are responsible for producing high quality medical images that assist physicians to diagnose, monitor and treat a host of medical conditions. Studies by Thambura and Amusa, (2016), Britton *et al.*, (2017) and Khoza *et al.*, (2018) all determined a shortage of radiographers resulting in work overload, stress and burnout to the existing radiographers. Chipere and Nkosi (2019:1) also revealed that newly qualified radiographers in the eThekweni district in Durban, South Africa, were overwhelmed by increased workload due to shortage of staff. The shortage of radiographers also resulted in long working hours (Chipere & Nkosi, 2019:3). Prolonged working hours have raised concerns of health and safety during the COVID-19 pandemic as well as increasing the risk of respiratory disease for radiographers (Lewis & Mulla, 2020:348; Mohammad *et al.*, 2020).

According to Ashong *et al.*, (2015:116), radiographers in Ghana experienced high levels of occupational stress due to tiredness, loss of interest in the practice, boredom, lack of focus and interference in vigilance. Similarly, Zhang *et al.*, (2020:12) confirm that medical radiation staff experience high levels of job stress and job burnout.

A study by Vanckaviciene *et al.*, (2014) on the supply and demand for radiographers in Lithuania predicted that by the year 2030 the current number of radiographers would be entirely inadequate due to changes in education, the socio-demographic characteristics of the staff, and the accelerating need for radiography services. These studies are in alignment with the findings from this current research study as the participants have clearly articulated their difficult experiences due to radiographer shortages in the public health sector of Eswatini.

### **3.3.1.3 Category 3: Absence of radiologists**

In this category, participants shared that the absence of radiologists in the imaging departments was yet another challenge which they experienced on a day-to-day basis. According to the participants, the absence of a radiologist results in unacceptable radiology requisition forms. Absence of a radiologist for the radiographers mean there is no one to screen x-ray requisition forms for justification and optimisation of requested examinations, or to guide the performance of fluoroscopic imaging procedures. This then means that there is an undocumented role extension for the radiographers. Radiographs are not reported and referring physicians sometimes request the opinions of the radiographers. The following verbatim quotes extracted from participant stories reveal the experiences related to the absence of radiologists.

FG 1 I1: *And then the other concerns like not having to work with a radiologist – we are just working blindly – we don't know what we are doing, basically. We are just doing what the doctors are requesting, because we have no-one who is advising us on what to do.*

FG 2 I4: *Okay, my working experience as a Radiographer in the Kingdom, I have realised that as Radiographers we work on our own. We run this, we literally run these departments on our own. Almost all hospitals in the country, they don't have a Radiologist...And none of those examinations are reported on. The images, they just go to the requesting doctor unreported. Then you'll find that the reporting doctor if maybe he finds some of the images challenging to report on, he will then come back again to the radiographer for assistance. So, which is a loophole for the profession on its own, to be a standalone department being run by Radiographers without the help of a Radiologist. That's my take. I thank you.*

FG 2 15: *I think it is because first of all it's because of the salaries because like for example we don't have a radiologist and maybe an oncologist....I am not sure if they have a know-how, if maybe there was a Radiologist he was going to motivate for such services in the country.*

FG4 14: *I don't know how to put it, when you mentioned the request forms, being requested by nurses and whoever, it has got to do with a radiologist. Can there be a national policy on that. Because it is written on the request form who is supposed to request it.*

A study by Sibanda *et al.*, (2017:8) found that out of five radiology departments that were observed in Zimbabwe, none had a resident radiologist, and radiographs were not reported. Similar findings were noted by Bwanga *et al.*, (2019:215) who remarked that there is a severe shortage of radiologists in Zambia, with only five serving the entire population of approximately 17 million. Reporting radiographs is the responsibility of radiologists or a trained radiographer who has formal training to perform such duties. Even though radiographers learn pattern recognition as part of their training, a radiologist report contributes much information on the treatment algorithm for physicians (Muhogora & Rehani 2017). According to Bwanga *et al.*, (2019:215), the severe shortage of radiologists leads to unreported radiographs, with the rural centres not benefitting from radiologist services at all. Interestingly, even in more developed countries, radiologist shortage is prevalent. A report by the Royal College of Radiologists reflects a continuing shortage of radiologists in the UK, as stated by the Radiological Society of Northern America (Allyn, 2020). These literature findings are in alignment with the participants' experiences in this study.

Another important contribution from the radiologist is their guidance on the radiation protection principle of justification and optimisation that needs to be applied by a radiologist. According to Muhogora and Rehani (2017), it is vital that diagnostic procedures are justified to avoid unnecessary radiological examinations. A considerable number of patients can be protected from unnecessary or further radiation exposures when justification and optimisation principles of radiation protection are applied prior to obtaining an imaging procedure, especially in a developing country (Sodhi *et al.*, 2015; Sibanda *et al.*, 2017:8). Rajanikanth (2014: 42,43) explains that in the United Kingdom, the legislation –*Ionizing Radiation (Medical Exposure) Regulations* states that, “when requesting a radiological investigation, the referrer (clinician) is required to provide sufficient and accurate clinical information for the Radiologist or Radiographer to be best able to determine whether the examination is appropriate and justified”.

Notably, literature reveals the scarcity of radiologists across the continent as one detrimental factor that is letting down proper radiology services delivery. Even globally, radiologist availability remains a challenge.



#### **3.3.1.4 Category 4: Lack of proper radiation monitoring and safety practices**

In this category, the participants expressed that the lack of proper radiation monitoring and safety practices impacted their experiences working in the public health sector. Lack of monitoring devices poses a critical challenge to these radiographers during practise. They were concerned about the amount of occupational radiation exposure they have received over the duration of their employment without monitoring dosimeters. They felt no one cared about their welfare in terms of monitoring the occupationally received radiation dose. Additionally, the country does not have a regulatory body nor a delegated radiation protection officer to perform activities relevant to radiation protection. Nevertheless, diagnostic radiographers are aware of the need for proper radiation monitoring and safety practices. The following verbatim quotes reflect the lack of radiation monitoring and safety practices from the participants' stories:

*FG 1 I2: O! Yes, but as a radiographer at school, I was trained that if I'm working in a radiation area, so I'm supposed to wear dose monitoring, monitoring dose badge, something that we monitor the accumulated dose.....that myself can recover from the radiation that I've just accumulated. But seemingly there's nobody who cares about our welfare.*

*FG2 I2: The first challenge is the radiation protection control. That one is a major issue because we don't have dosimeters at all. Most of the time, we don't use them. So, we don't know how to monitor. We don't know how radiation is monitored because there is nothing to check whether we are being exposed or not. That is a major challenge that we are having in the country.*

*FG3 I3: I want to point out the thing of radiation exposure. We just need an agent; I don't know what Government will do about this, but it's urgent, we need radiation control. Who will be monitoring the departments and us, let me say the whole departments of the country? We don't know anything about radiation, how radiation has gone far, with us, the public that's the problem.*

*FG4 I2: And also, secondly, I think I have got a challenge. Since I was hired, there are no dosimeters here in this, I can say, in this country, there are a few hospitals whereby I can find the radiographer having a dosimeter which is a huge challenge just because we are working here in a radiation area. So, it's a big challenge to work there without a dosimeter. So you don't know how much dose you have received in that particular month. So, I think we have to maybe have that too...So there is a gap in the radiation safety.*

Radiographers are aware of the need for personnel monitoring when working with radiation emitting equipment. Radiation monitoring of imaging personnel is essential to ensure that staff dose limits are not exceeded (Botwe *et al.*, 2015:1). As determined by a study by Okaro *et al.*, (2010), personnel radiation monitoring was poor and there was a significant corrective break

as radiation risks could not be assessed nor were remedial measures taken in South Eastern Nigeria. Similarly, Botwe *et al.*, (2015:6) found that radiation monitoring of occupational personnel at the biggest tertiary referral hospital in Ghana was inadequate and failed to meet the required standards. Additionally, the hospital management neglected to provide for it in their budget (Okaro *et al.*, 2010). Nassef and Kinsara (2017) mention that dose estimation for radiation workers is an essential factor for government and organisations to evaluate radiation risks and establish protective measures. Studies by Awosan *et al.*, (2016:10) and Maharjan *et al.*, (2020:3) demonstrate poor radiation protection practices despite good knowledge of radiation hazards among the participants.

According to Cheung (2013) and Ploussi and Efstathopoulos (2016:145), the establishment of Radiation Protection Safety Culture (RPSC) facilitates the reduction of the radiation dose, enhances radiation risk awareness, minimises unsafe practices, and improves the quality of a radiation protection programme. In the same way, Dlamini and Kekana (2020:631) accept that there is awareness amongst radiographers in Eswatini that radiation safety practices are necessary for radiography departments, together with continuous education and training, as imperatives for improving radiation safety in the radiography departments. They support the idea of establishing a self-regulatory body (Dlamini & Kekana, 2020:631). Muhogora and Rehani (2017) and Botwe *et al.*, (2015:7) suggest that the lack of medical physicists is one of the crucial radiation protection challenges faced by most African countries.

The stories shared by the participants of this study concur with the current literature. The need for implementing proper radiation protection and safety culture in Eswatini cannot be ignored.

### **3.3.1.5 Category 5: Poor remuneration**

The study participants expressed that poor salaries in the public sector are a significant demotivating factor. This challenge was even observed by the researcher on the participants' facial expressions and gestures. Poor remuneration means demotivation of the radiographers which could result in poorer performance and diminished job satisfaction. The following excerpts contain participants' exact words expressing the remuneration challenge.

*FG1 I1: Yes, during my experience as a radiographer in the kingdom of Eswatini public services. First of all, working as a radiographer you work long hours, and the remuneration is very low.*

*FG2 I5: The other thing radiographers in the country, in public didn't say public; we didn't say public one? Yes, in the public sector, they are demotivated, we are demotivated. The salaries are meagre.*

*FG3 I2: The remuneration. It's very! very! poor.*

*FG3 13: And also what has been demotivating us is the poor salaries. After hard work, then there is that poor salary which demotivates the radiographers. And in conclusion, I can say, I can say okay, they need to improve our service.*

Remuneration is an essential element of any human resource for a health strategy. Britton *et al.*, (2017:30) and Khoza *et al.*, (2018:28), in their studies, found that remuneration and working conditions were contributing factors to poor job satisfaction amongst radiographers in the public sector in Gauteng, South Africa. Likewise, Thambura and Amusa (2016:103) and Gow *et al.*, (2012:42) found that poor salaries were one of the factors that led to radiographers resigning in Kwa-Zulu Natal, South Africa, and in the public sector in Zambia, respectively, as it was difficult for the workers to stay motivated. According to Kajungu and Mugisha (2015:99), extra allowances are a strong incentive for health workers to remain in the healthcare sector, especially in rural areas.

According to Bertone and Witter (2015:2), a good human resource for health strategy cannot be taken into consideration for policy-making without exploring and understanding the generally complicated remuneration of health workers. Furthermore, the role salary plays in determining recruitment, retention and motivation, together with the performance of health systems and the progress towards universal health care cannot be overemphasised, argues Bertone and Witter (2015:7) and Tijdens *et al.*, (2013:3). Literature reveals that many countries have difficulty in attracting health workers to certain areas, and low pay exacerbates low motivation, morale and retention. According to Ogenyi *et al.*, (2015:19, 20), inadequate remuneration has been identified as a major job factor which negatively impacts overall job satisfaction of radiographers in both clinical and academic sectors. These findings are similar to the experiences of the radiographers in the current study who admitted to feeling demotivated because of poor remuneration.

However, it is important to note that in contrast, a study by Vujicic (2009:3) reported that a 60% salary increase led to higher retention of public sector doctors and nurses without any report of changes in their motivation or performance in Swaziland, now Eswatini. This then indicates that there are numerous factors, in addition to remuneration, that can lead to demotivation and poor performance.

#### **3.3.1.6 Category 6: Stagnant professional growth**

In this category, diagnostic radiographers explained that there is no career progression within the public sector. They articulated that the radiography profession is mired by stagnation. Stagnation for these radiographers means they remain in the same position after several years of employment. Stagnant professional growth means a lack of prospects for promotion to a

higher level during one's career. The following verbatim quotes clearly express these findings of a stagnant career in the stories:

*FG1 I1: And also the, in the working for the public sector in the kingdom of Eswatini we lack a structure, a career advantage, what is it called – a structure for development. As for myself, I've worked for more than ten years, and I have already reached the ceiling. I'm a senior radiographer so, I would like ... [speaking own language inaudible 09.13.1] to see a structure for development.*

*FG1 I3: Okay, to be totally honest. As much as I love radiology, I wouldn't advise a close relative to become a radiographer in this country, for the reasons that, for the reasons, I've mentioned. There's no career development in radiography. And for almost 20 years, we have been requesting a lot of things to improve this profession, but we haven't received anything.*

*FG2 I1: Well, what I can say is that since I arrived as a Radiographer, one of the key things that I've noted was that we had no structure. In the cadre as Radiographers, we had no structure; there was no sense of progression, in terms of when you come into the cadre, where you're going to be after ten years, or you wish to be after 30 years. You're in the same position you are. It might be the same position you will leave when you retire, so that was not encouraging for any development or further studying in our cadre.*

*FG4 I4: Then second, there is no hierarchy in radiography in Swaziland. We are all grouped together. This all starts from the ministry. I guess very few people in MOH know about what radiography is, that they mean what goes on in the department....*

A successful career makes a person proud and happy, whilst failure in one's career impacts self-esteem and often ushers in unhappiness (Abele *et al.*, 2011:124, 125). Britton *et al.* (2017:30), Khoza *et al.*, (2018:29) and Khoza *et al.* (2020) all found that radiographers in the public sector in Gauteng, South Africa, felt that the radiography profession is beset by stagnation. Tambura and Amusa (2016:105) also confirmed a lack of opportunity for professional career development for KwaZulu-Natal radiographers, thereby affecting their level of satisfaction. According to Zain *et al.* (2016:32) and Ogenyi *et al.*, (2015:19, 20), the opposite – role advancements – benefit radiographers in enhancing personal fulfilment, job satisfaction and career advancement. A UK study by Hutton *et al.* (2014:9) established that professional development reinforced and informed by a performance development review was a simple and effective way of enhancing satisfaction amongst radiotherapy radiographers. Khine and Stewart-Lord (2021:99, 100) agree that in fact, career progression is the most important aspect of every healthcare worker, especially among advanced and consultant roles within therapeutic radiography practitioners. Maintaining and improving morale in the existing workforce are critical success factors in delivering high-quality services and care (Hutton *et al.*, 2014:10; Prentakis *et al.*, 2016:3). It is evident from the literature presented and the stories shared by

the participants of this study that career development and progression are vital factors in improving job satisfaction.

### **3.3.2 THEME 2: Council constraints**

In this category, participants expressed that the council has the mandate to keep a register for all practising radiographers. It also has a role in monitoring the radiographers whilst they practice concerning what they do, with the goal of instilling a culture of lifelong learning. There are no documents to guide radiographers during practice or tools to guide radiography practice in Eswatini.

Council constraints for the participants meant that there was poor representation of radiographers within the medical and dental council of Eswatini. As a result, the scope of practice for radiographers is not documented, or at the least, adherence to an internationally documented scope is not monitored. The council has a role in preparing and implementing professional practice standards for radiographers (HCPC, 2013; ASRT, 2019; HPCSA, 2020). Regulation of services delivery by radiation workers through established patient referral guidelines as to who is supposed to refer a client for a radiographic procedure is a responsibility of the council in conjunction with the radiation control body (DOH, 2014; HPCSA, 2020).

The researcher can share that she cannot remember any training that was hosted for radiographers by the council in the 18 years she served as a radiographer in the country, nor any mention of a representative of radiographers within the board. However, the following categories support the need for a health professions council that represents the radiographers in Eswatini.

#### **3.2.2.1 Category 1: Poor representation**

In this category, radiographers expressed a need for an independent council for radiographers that understands how the radiography profession operates. In addition, they felt that the council has a mandate to monitor, evaluate and guide practising radiographers. The board also has to conduct training workshops, seminars or conferences at least once a year for radiographers.

Representation for the radiographers meant that the council has a role in regulating the practice and ensuring adherence to practise standards as autonomous practitioners. The following stories from the verbatim quotes uncover participant views for representation within a council.

*FG1 I6: I think if maybe we have our own independent ... medical council we can make decisions like for ourselves because we know how the department work. We know how to achieve our work; we know what we need and what we do not need.*

*FG1 I6: And another thing – training like my colleagues have said radiology has a broad version. Some of the things, where I studied, the people that I studied with have told me things that I don't know, like a lot of them they have been trained like once in a while they go for training for radiographers. They have a council for radiographers where you we, once in a while in November, they are brought for the training and when they asked me I just told them Aahh..., you know the Government for the past 4 years I've been telling them that. And it's very embarrassing for me.*

*FG2 I3: Also another thing we have got Medical and Dental Council in Eswatini that registered the Radiographers. Their role, I personally believe should be to monitor, evaluate and help guide Radiographers and those that are practicing under radiology unfortunately once you register or once you do not register, there is no tool that they have to collect that data, whether you're practicing with or without a certificate. You can firstly register then do not subscribe for a year or so there will be no tool that will they will use to follow whether you have paid their subscription fee. And also, once you've subscribed, then "there should be services that goes with that subscription fee". You shouldn't subscribe then, then there are no services that are being rendered by the Medical and Dental Council.*

The Health Professions Council's main function is to protect the public (HCPC, 2011-13:4; McLaughlin *et al.*, 2015). The main purpose of a health professions council is to "regulate and guide registered healthcare professions and protect the public through setting contextually relevant standards for healthcare training and practice, setting and maintaining standards for ethical and professional practice" (HCPC, 2011-13:4). Regulation of practice forms a critical part in radiography as protection for the public, self and others is a basic principle in executing radiographic procedures. Prentakis *et al.*, (2016:2) support that the role of a health professions council is to assure that higher education and training meet certain standards, maintain a national registry of radiographers and address professional issues including offering of a licence to practice. Another critical function of a council is to promote lifelong learning through continuing professional development (CPD) to maintain competency. Enhancement of knowledge, skill and competency is a primary feature in continuous professional development (Thingnes & Lewis, 2011:12; Wareing *et al.*, 2017; Mung'omba & Botha, 2017:5, 6). Learning activities are undertaken by professionals to maintain, update and develop their professional skills and knowledge (HCPC, 2011-13:4; Babenko *et al.*, 2017: 157).

It is clear from the literature presented that having council representation is crucial for the development of the profession and for the well-being of the patient. The findings from this study is well supported by literature.

### **3.3.2.2 Category 2: Scope of practice of radiographers**

In this category, diagnostic radiographers expressed that their scope is limited, as they do not practise much of what they were trained to do. On the other hand, they are expected to perform procedures that are not in the radiographers' scope of practice. For example, these radiographers are meant to perform fluoroscopic radiographic procedures without supervision by a radiologist. The undocumented scope of practice is assumed by the radiographers as a role extension. However, the concern is that the radiographers could be held liable for any possible negative outcome from the fluoroscopic procedures as there is no documentation allowing radiographers to perform such.

One participant reflected that the employer is expecting them to perform these procedures, but without any guidance or training offered. This underscores the lack of a well-documented scope of practice by the licensing and regulatory body including monitoring or adherence to the scope. The following stories from the participants support the findings of a limited scope and a lack of well-documented scope of practice.

*FG3 I2: Yes, our scope is limited. Thank you. Our scope is limited. We don't do much of what we are being taught at school because the scope is limited.*

*FG2 I3: No, there is no documentation, and having said that, I foresee a problem in future if something goes wrong because some of those procedures are not in our scope to do that. So the Government maybe be happy we are doing it, but if maybe something bad can happen. Then you are accountable; that is when your scope of practice will be read for you, and it will be discovered that you were not supposed to do that.*

*FG2 I3: The problem is those are our relatives. And we know we don't, as they have; my other colleagues have mentioned, we don't have a Radiologist in the country, so sometimes "you just do it because you pity the patient. It is a role extension.*

*FG1 I3: And yet expectations are so high from our employer, expectations for us to perform and yet we do not have those tools or whatever to perform. We don't even know what we are expected to perform.*

"A scope of practice delineates the parameters of practice and identifies the boundaries for practice for radiographers" (ASRT, 2019:6). In conjunction with the scope of practice, there are practice standards which direct and maintain safe and clinically competent radiographic practice. Practice standards are important because they promote and guide clinical practice

by providing an evaluation tool for one's self and colleagues to ensure clinical proficiency and safety (Davis, 2014). Prentakis *et al.*, (2016:2) in their study found that in most European countries, with the exception of Cyprus and the UK, close supervision by a medical doctor or a medical physicist is mandatory for the radiographer to carry out certain procedures such as preparation and administration of contrast media and radiopharmaceuticals.

A study by Sibanda *et al.*, (2017:8) identified an unofficial role extension amongst radiographers in Zimbabwe. Radiographers assumed some roles that are officially in the scope of practice for the radiologists (Kekana *et al.*, 2015:1115; Zain *et al.*, 2016:32; Sibanda *et al.*, 2017:8). Similar to the findings of this study, Eswatini radiographers assumed roles that fall within the scope of a radiologist.

In South Africa, role extension has escalated to advanced stages. The Healthcare Professions Council has approved that, "Diagnostic radiographers may only interpret images and introduce or inject contrast media if they have obtained the relevant board-approved postgraduate qualifications and registered such qualifications with the HPCSA" (HPCSA. Scope of Practice: Diagnostic Radiography 2020:5). Literature reveals that most countries globally have introduced role extension for radiographers in a systemic, evidence-based and policy guided manner (Kekana *et al.*, 2015:1122; Wuni *et al.*, 2020; van de Venter & Friedrich-Nel, 2021:46). According to Wuni *et al.* (2020), the need for a policy to guide the introduction and practice of role extension in diagnostic radiography is crucial.

The above literature and findings of this study support the need for a clearly defined and well-documented scope of practice for general radiography practice considering role extension within the country's context.

### **3.3.2.3 Category 3: Improper or absence of guiding documents**

In this category, participants expressed that there are no documents guiding radiography practice in the country. These include standard operating procedure documents (SOPs), guidelines, patient referral policy or guideline on x-ray procedure referral. Additionally, there is no law on radiation protection. The participants felt that there are no laws and guiding documents to structure radiography practice in the country. The participants reinforced that there are no documents such as guidelines or SOPs, especially when ordering stock like x-ray films. The following stories from the participants reveal a lack of guiding documents.

*FG2 I1: And there's not much regulation regarding radiation in the country regarding the usage of radiation in the country, and we are generally lacking guidance and laws actually to structure our practice as radiographers.*



*FG1 I3: It's not written down anywhere that, that should be the process so that we can change that and the only way to change that is to sit down as a cadre and develop sop's, standard SOPs for radiographic departments that the radiography department if they want films, they speak directly to CMS. That's just an example.*

*FG2 I1: "Yes, I mean what I mean about that is that you find that there's no stipulated rule of the usage of radiation. You find that the people in Swaziland are misusing. You find doctors sometimes ordering X-rays so frequently....But if there were a guideline or a law stating that such usage of radiation should be inhibited, it would be better.*

*FG4 I1: And not having such guidelines, or anything guiding our profession, it is more like another disadvantage. It doesn't give us proper freedom; it doesn't give us enough flow to express ourselves in any other way.*

Generally, guiding documents are documents created by leadership to help describe the organisation's purpose, mission and vision (Rego *et al.*, 2015:69). They also prescribe guiding principles for the organisation, describe organisational structure, explain how the organisation conducts business and governs itself (Rego *et al.*, 2015:70). According to Sajdak *et al.*, (2013), setting up SOPs for an imaging department is a starting point to ensure technical standardisation and regulatory compliance. Literature reveals that various healthcare institutions have SOPs on patient identification and confidentiality, patient safety, the reporting of incidents and infection control (Sajdak *et al.*, 2013; Patel *et al.*, 2017:11, 12; Chaudhari *et al.*, 2020; Essop & Kekana, 2020).

Imaging referral guidelines remain the most effective tool in ensuring appropriate justification of medical exposure (Malone *et al.*, 2012; Pérez, 2015; Ebdon-Jackson & Frija, 2020). It is vital for healthcare practitioners requesting medical x-rays to take the principles of justification and optimisation into consideration (Sibanda *et al.*, 2017:9). These literature sources highlight the importance of documents and guidelines which according to the participants' experience's, this is lacking in Eswatini.

### **3.3.3 THEME 3: Lack of professional autonomy**

In this category, the radiographers expressed a quest for independence. They felt there was a need to be autonomous, to function as an independent unit. Diagnostic radiographers have no freedom of expression in terms of contributing suggestions for supplies they need for their day-to-day operations. They mentioned that another department, referred to as the Biomedical Engineering department, makes decisions on their behalf when they need to procure or request new equipment. However, the overall perception was of not being recognised or appreciated by leadership, the senior management level of the health sector which is the

Ministry of Health. The following categories were derived from the participants' words. These include radiographers not having power or not being involved in the decision-making process. The radiographers also felt that they were not recognised or appreciated by the employer or those who work with them at healthcare facility level or even by other healthcare workers.

### **3.3.3.1 Category 1: Radiographers have no power or are not involved in decision-making.**

Diagnostic radiographers felt that they had no power or were not involved in the decision-making process for issues relevant to their profession or the functioning of the radiography departments. For example, when they request to procure equipment, the Biomedical Engineering department decides on their behalf. The following stories reflect this experience.

*FG1 I1: I'll make an example of what I mean by independence. You see, if maybe we want to buy equipment, I think as the users of the equipment "we should have a full say". For example, where we are now, even if we want a digital system, it will be decided by biomedical engineering and the ministry, yet we are the end-users. So, I feel if we can be an independent department, just like a pharmacy, for example. May I end there?*

*FG1 I2: If they want to build an X-ray department, they are supposed to consult us and ask for our views and a plan outline; how do we go about with this thing? And then also, if you maybe say it is a structure being built, you are supposed to be a focal person who can be consulted. So, it must be a radiographer sought off... maybe radiation protection officer or what.*

*FG4 I2: On the whole level there is this slight slacking because ...[vernacular- we are in Government] if we request something like maybe if you put in there...[vernacular- we are requesting for the machine to be fixed] you are going to be jumping through hoops because it's public. So that's the biggest challenge for me working for Government is that it's like wow, you have to end up just fighting for yourself. Like you have to, yes.*

According to Britton *et al.* (2017:31), having the authority to make decisions and the freedom to act following one's professional knowledge best describes autonomy or independence. A study by Lohikoski *et al.*, (2019) in Sweden found that radiographers wanted to stay in their current jobs but felt they had only a small degree of control over their work. Equally, a study by Okeji *et al.*, (2012:33, 34) found that most hospitals did not involve radiographers in planning, procurement, and delivery of radiology equipment nor have a policy to involve the end-users in equipment procurement in Nigeria. Likewise, Mankanjee *et al.*, (2005:122), in their study, discovered that management failed to accurately and adequately communicate decisions made at top level, and that radiographers had no input in decision-making. Additionally, a study

by Ogenyi *et al.*, (2015:19-20) established that radiographers emphasise the need for autonomy, respect and value for both academic and clinical radiographers in Nigeria.

Yielder (2014:64) states that the radiography profession is replete with a culture of subservience and monotony. According to Yielder (2014:64), this could be due to the background of medical domination that had persisted over the years when a hierarchical system was created within radiology departments and this restricted the radiographer's role. Contrary to these findings, however, role extension into bone densitometry and emergency ultrasound in the UK has afforded radiographers some autonomy in clinical decision making, including referral for other imaging or investigations (Field & Snaith, 2013:13).

It is clearly articulated in literature that radiographers want more independence and involvement in making decision and this resonates with the findings of the current study and the experiences shared by the participants.

### **3.3.3.2 Category 2: Not well recognised and not appreciated**

The radiographers expressed that they are not well recognised. Recognition for these radiographers means that the employer should recognise them for their energy, efforts and accomplishments. But in reality, they are more like “ghosts” that the healthcare facilities need. According to the radiographers, senior management should radiate recognition at the ministerial level. Participants, though, expressed a poor understanding of the radiography profession by all levels of leadership in the healthcare sector. The following extracts echo the participants' perceptions of recognition.

*FG1 I2: Yah! It has to go with recognition. We are not recognised for the job that we are doing because every experienced outcry because in the past a lot of things have been happening....*

*FG3 I1: The people that we are working for don't see that; they don't realise how important you are. How much energy and effort and everything you put into this profession.*

*FG4 I1: It doesn't give us true freedom; it doesn't give us enough flow to express ourselves in any other way. So we are, it's more like we are the ghosts that are needed by the facilities, by the health system....*

*FG1 I3: My general perception of it is that there is a cadre, is that it is not taken seriously at ministry level at all. That's my first point. My reason for saying this is, I've been working here for almost 20 years now, having started working in 2003, and nothing much has changed.*

In general, every employee desires recognition and appreciation because these are everyday human instinctive needs. The *Oxford Advanced Learners Dictionary* (OALD, 2015:1246)

defines recognition as the act of accepting that something exists, is accurate or is official, whilst appreciation is a complete or sympathetic understanding of something, such as a situation or a problem and of what it involves. Recognition of radiographers at a global level means recognising radiography as a profession with a globally accepted standard of education, professional scope and naming of the domain (Lundvall, 2019:10). A study by Britton *et al.* (2017:30) found evidence that the lack of recognition of radiographers by colleagues from other medical disciplines affected their confidence and self-esteem. According to Naylor *et al.* (2021:191), lack of professional recognition led to misunderstanding and conflict due to friction between radiology and other professions, particularly around processes of managing COVID-19 within the department, owing to other professions not fully understanding radiography processes. Similar feelings were expressed by the participants of this study.

### **3.3.4 THEME 4: A sense of professional pride**

The common expression “*Every dark cloud has a silver lining*” holds true for this study’s findings. Even though the study has identified several challenges faced by diagnostic radiographers in the public sector of Eswatini, there were also positive experiences expressed by the participants. They articulated a sense of professional pride by expressing their love for the radiography profession, making a difference during the COVID pandemic and the excellent work experiences.

#### **3.3.4.1 Category 1: Love for the profession**

Diagnostic radiographers expressed their love for the profession. However, the radiographers felt that if the above challenges could be addressed, they would love their job even more, remain at work for the public sector and enjoy teaching radiology skills to other people. The following stories from the participants validate this finding.

*FG3 I2: If they were to be addressed? I would be satisfied; I would love my job. I will remain with the government of Eswatini. It's the motivation than anything else.*

*FG 4 I3: I am already enjoying it. You know it would be an add on for me because it would make it so much better.*

*FG4 I1: Yes, it would be more fun; you would even enjoy teaching it to other people. I will even encourage other people to come to join in.*

Studies by Britton *et al.*, (2017:31) and Khoza *et al.*, (2020:7) confirmed that radiographers in Gauteng, South Africa, love their profession. They have a passion for the job, despite the few things that need to change, such as recognition of the radiography profession (Britton *et al.*,

2017:31; Khoza *et al.*, 2020). Moreover, Williamson and Mundy (2010) maintain that prospects and challenges are inherently linked with job satisfaction, suggesting that misalignment of these would potentially negatively impact motivation and retention of the future radiography workforce. Surprisingly, Lewis and Mulla (2020:351) in their study, found that radiographers still loved their job and even prided themselves for being part of the diagnosis and management of COVID-19 by always putting the patient first.

In line with the findings of this study and other previous studies, it is evident that radiographers love their job within their work context.

#### **3.3.4.2 Category 2: Making a difference during COVID-19**

The participants felt that the role played by radiographers during the COVID-19 pandemic was outstanding concerning the diagnosis and management of the disease. This also contributed to their professional education. Participant's felt the outbreak of the COVID-19 pandemic had demonstrated the need for radiographers; therefore, they hoped for a change in the radiographers' welfare. In addition, the participants appreciated that radiography services are available in every region of the country, which also plays a significant role in the diagnosis and management of the disease in some healthcare facilities.

*FG2 I5: With the outbreak of the pandemic Radiology services are also assisting in the diagnosis of COVID as. For example, with CT, we can diagnose COVID-19 as it is; what am I saying? As it is diagnosed by ground glass appearances.*

*FG3 I3: I think Government has to stand up, for example, at this time for COVID, I think now they have seen that we really need the radiographers. So, there is a need that they must look after radiographers.*

*FG2 I2: On a positive note though the Department in the diagnostic cadre is able to do diagnostic services in the four regions of the country, they do have in each and every region we have several hospitals that offer our services.*

Literature contains numerous studies that have demonstrated the critical role of imaging in the diagnosis, treatment and management of COVID-19 (Chen *et al.*, 2020; Farias *et al.*, 2020; Jiang *et al.*, 2020; Mardliyyah *et al.*, 2020; Mohammad *et al.*, 2020; Stogiannos *et al.*, 2020). Radiographers play an important role in making good diagnostic images, especially in the CT scan during the COVID pandemic (Mardliyyah *et al.*, 2020:83).

The imaging characteristics and changes throughout the course of the disease in patients with COVID-19 help provide a clinical diagnosis for clinicians, including those with worsening respiratory conditions (Farias *et al.*, 2020:2, 7). The use of chest imaging in COVID-19 can be

helpful for patients with moderate to severe symptoms or those with a risk of progression due to the presence of comorbidities (Farias *et al.*, 2020:2, 7; Jiang *et al.*, 2020:2). Thin-slice chest CT has been reported to be reliable and practical for diagnosing COVID-19 (Farias *et al.*, 2020:4; Jiang *et al.*, 2020:5). Chen *et al.*, (2020:44) Farias *et al.*, (2020:4), Frija-Masson *et al.*, (2021:3,4) Jiang *et al.*, (2020:2), Li *et al.*, (2019:788), Stogiannos *et al.*, (2020:261) and Zu *et al.*, (2020:18) all agree that typical CT findings included bilateral ground-glass opacity, pulmonary consolidation, and noticeable distribution in the posterior and peripheral parts of the lungs.

The above literature concurs with the participants' stories on the critical role of radiographers in providing imaging services for diagnosis, treatment and management of COVID-19 patients and its presentation on CT images.

### **3.3.4.3. Category 3: Good working experience**

The study findings have demonstrated that diagnostic radiographers in Eswatini faced multiple negative challenging experiences. However, positive work experiences do exist for radiographers. Good work experience for the radiographers included gratitude for teamwork amongst colleagues. They expressed good work experience by appreciating that the government was upgrading the radiography departments from analogue to computed radiography or direct digital imaging. Good work experience for the participants meant being able to provide radiography services to the less fortunate citizens, more significantly in the rural areas. The following excerpts from the participants' words clearly express these positive experiences.

*FG1 I5: I would say I've had a good experience working as a radiographer and the only reason why I would say it's a good experience is because of the work environment. And when I speak about the work environment, I speak about the people, the colleagues. So that's the only reason I'd say it is a good experience.*

*FG2 I2: The positives are that we are trying as the Government is trying to improve the Radiology Departments as we have seen now that we are migrating from analogue to digital. So that's positive.*

*FG3 I1: It would definitely be, being able to help all the less fortunate people in the rural areas that are able to get services. That for me ... [intervened].*

*FG4 I3: I have one positive thing. Like we usually find it in the public sector, teamwork. Because we are all in this struggle together.*

A study by Britton *et al.*, (2017:30) established that radiographers are committed to providing excellent patient care and value positive interpersonal relationships with colleagues. In the same way, Lehmann *et al.*, (2015:180) and Britton *et al.*, (2017:30) learnt that radiographers formed their own auspicious work environment even if salary and recognition brought dissatisfaction. Consequently, the overall condition of the radiographer is paramount to the promotion of the excellent well-being of the sick patient (Ogenyi *et al.*, 2015:15). Additionally, Rosen *et al.*, (2018:17) support a need to design strategies for effective communication and teamwork amongst healthcare professionals, which subsequently impact the quality of healthcare services and patient outcomes. Furthermore, Mafini and Dlodlo (2014:10) established that extrinsic factors such as quality of work-life, supervision and teamwork were statistically significant factors affecting job satisfaction for employees in a public organisation. According to Mafini and Dlodlo (2014:7) an increase in remuneration, quality of life, teamwork, promotion and supervision can stimulate job satisfaction and, ultimately, life satisfaction amongst public service employees.

The above literature and findings of the study all agree that teamwork amongst colleagues creates a good work environment. This was evident even through the facial expressions and gestures whenever a participant communicated a story of working in the public healthcare setting in Eswatini.

### **3.4 Conclusion**

The research results have demonstrated that the lived experiences of diagnostic radiographers working in the public sector in Eswatini were no different from the experiences of other radiographers around the globe. Literature has revealed that lived work experiences of radiographers working in the public sector on the African continent were almost similar. According to Mafini and Dlodlo (2014:10), Thambura and Amusa (2016:105), Britton *et al.*, (2017:30, 31.32), Khoza *et al.*, (2018:29) and Khoza *et al.*, (2020:120), remuneration, working conditions, lack of career development, supervision and teamwork are the most prevalent factors affecting job satisfaction amongst public healthcare employees. Ugwu *et al.*, (2011:14), in their study, recommended employment of more radiographers by hospital managers, improved remuneration, a precise definition of roles, and the organisation of stress-intervention programmes for radiographers as a means of reducing stress.

The next chapter will discuss guidelines and recommendations on the above themes and categories that could assist radiographers during practice.

## CHAPTER 4:

### GUIDELINES, RECOMMENDATIONS AND CONCLUSIONS

#### 4.1 Introduction

The previous chapter discussed research findings through thematic analysis and categorising of the emergent data from focus group interviews. The literature review for each theme was conducted through a survey of multiple databases for different healthcare professions and publications. Chapter 4 then focuses on the guidelines developed from the findings and recommendations that may assist diagnostic radiographers in underdeveloped countries.

#### 4.2 Overview

During the literature exploration in Chapter 3, it was evident that diagnostic radiographers in the Eswatini public health sector face similar challenges to the global community of radiographers, especially those in African countries. However, whilst listening to the participants' stories, it was apparent that diagnostic radiographers struggled with certain fundamentals of the radiography profession. They revealed emotional and psychological strain through gestures during the group interviews and openly expressed that working for the public sector was challenging. Despite these challenges, however, participants also spoke about their professional pride. Based on the findings of the study it was therefore imperative for the researcher to develop guidelines that would assist diagnostic radiographers during practice.

#### 4.3 Guidelines

The guidelines were developed based on each theme resulting from the study. A guideline is described as “information intended to advise people on how something should be done or what something should be (*Oxford Advanced Dictionary, 2015:677*)”. A process of inductive and deductive reasoning was applied. Deductive reasoning was applied by the researcher to make conclusions. The researcher then reflected on the data to develop guidelines. The obtained themes were used to develop guidelines to enhance radiographic practice among diagnostic radiographers in the public healthcare sector of Eswatini. Core expertise within the radiography profession includes responsibility and knowledge, competency which contributes to caring for the patient, image quality, radiation protection and patient safety. These guidelines will translate evidence into best practice through the development of a proper management structure and the promotion of effective radiographic practice standards. They will also encourage professional growth and development through the creation of a supportive



environment for radiographers (Rosenfeld & Shiffman, 2009:4). A description of these guidelines will be provided in this chapter.

Table 4.1 below provides the themes, guidelines and strategies for their implementation.

**Table 4.1: Themes and guideline strategies**

Themes	Guideline
<b>Challenging work environment</b>	<b>Development of a proper management structure</b> <ul style="list-style-type: none"> <li>• Bridge the gap between higher-level management and clinical radiographers</li> <li>• Motivate for the use of tele-radiology and Artificial Intelligence</li> <li>• Develop mentorship and orientation programmes for new staff</li> <li>• Delegate one radiographer to act as a Radiation Protection Officer (RPO)</li> </ul>
<b>Council constraints</b>	<b>Development of Radiographic Practice Standards</b> <ul style="list-style-type: none"> <li>• Appoint a council representative at regional level</li> <li>• Clearly define roles of a radiographer and develop an SOP</li> </ul>
<b>Lack of professional autonomy</b>	<b>Encourage professional growth and development</b> <ul style="list-style-type: none"> <li>• Build a radiographer identity</li> <li>• Participation in Continuous Professional Development (CPD)</li> <li>• Encourage evidence-based practice</li> </ul>
<b>Sense of professional pride</b>	<b>Create a supportive environment for radiographers</b> <ul style="list-style-type: none"> <li>• Have monthly peer discussions</li> <li>• Dedicate a tea/lunch room for socialising and de-stressing</li> <li>• Promote the profession through communication channels such as social media and other forums</li> <li>• Establish/engage in team-building activities</li> </ul>

#### **4.4 THEME 1: CHALLENGING WORK ENVIRONMENT**

##### **Guideline 1: Development of a proper management structure**

The first theme to emerge demonstrated a challenging work environment. Participants explained that they experienced a lack of resources and consumables (films) because they had to order through the pharmacy department. Additionally, the participants expressed that working without a radiologist could result in medicolegal consequences. They articulated that their training does not allow radiographers to perform some radiographic procedures but rather to assist the radiologist.

Another primary concern for the radiographers was the amount of radiation they had accumulated through working without monitoring dosimeters. Lastly, they expressed dissatisfaction in the workplace due to poor motivational elements such as remuneration and

professional career progression. Despite having so many work challenges, participants were optimistic that things would change as they could appreciate the stride taken by the government in addressing some of the highlighted difficulties, such as an ongoing review of their salaries.

By creating a proper management structure, these challenges could be addressed by a knowledgeable individual who understands radiography better. Since there is no formal organisation structure within Eswatini, this is a recommendation that can be proposed to the ministry of Health. Senior radiographers will be invited to volunteer for taking up this project, motivated or led by the researcher.

Suggestions on how to implement this guideline are provided below.

#### **4.4.1 Bridge the gap between higher-level management and clinical radiographers**

Literature reveals that most healthcare system problems are engulfed by poor communication and leadership challenges (Ghiasipour *et al.*, 2017:5). The researcher, therefore, believes that bridging the gap between higher-level management and clinical radiographers can mitigate the challenges faced by radiographers in the country. The health services delivery of the country is decentralised within the four different regions, with regional management offices in each region. The radiographers need a radiography professional to lead them who would be in a better position to understand their roles and responsibilities. In addition, they need a representative to be the voice between them and senior-level management at the Ministry of Health.

The participants voiced a leadership crisis within the profession resulting from the lack of a career structure. According to Lau (2007:1), radiology is undergoing rapid changes due to technological developments, workload acceleration, staff shortages, globalisation, corporatisation, commercialisation and commoditisation of healthcare. Therefore, leadership is required to conceptualise and endorse a culture where the focus is detached from today's subsistence to fundamental improvements and wherein staff members have the autonomy to act (Ghiasipour *et al.*, 2017:5; Nielsen *et al.*, 2013:3). Similarly, Sfantou *et al.*, (2017:13) endorse that management and leadership of healthcare professionals are critical for well-coordinated and integrated care. Therefore, selecting a representative from each healthcare facility to liaise with the regional health offices, who would then coordinate with higher-level management at MOH would bridge the gap between clinical radiographers and higher-level management.

#### 4.4.2. Motivate for the use of teleradiology and artificial intelligence

Participants highlighted that there are no radiologists in the public health sector. The participants declared that in the public sector, radiographs are not reported or interpreted by a radiologist. Sometimes medical officers request the radiographers' opinions when reading radiographs. But the necessity of a radiologist was authenticated by participants from all the focus group interviews. Following this finding, the researcher proposes the exploration of teleradiology. The use of teleradiology could be a possible intervention to address the above challenge. Enormous evidence regarding the feasibility of teleradiology and related information technology applications exist in the literature (Coulborn *et al.*, 2012; Essop & Kekana, 2020; Kichloo *et al.*, 2020; Mohammad *et al.*, 2020; Ebdon-Jackson *et al.*, 2021). The absence of radiologists often results in the delayed and inaccurate diagnosis of some diseases leading to improper case management and increased morbidity and mortality (Kichloo *et al.*, 2020:7). Literature reveals that a lack of accurate radiologic interpretation is common in most African countries, including Eswatini, which does not have a single radiologist in the public service sector (van Zyl *et al.*, 2021:8).

Teleradiology is based on the electronic capture, transmission, storage and retrieval of images for remote viewing and interpretation. The modern digital era and recent advances in technology, as well as the numerous clinical applications of teleradiology and the growth of radiology itself, have altered and refined patient management in some cases (Coulborn *et al.*, 2012:708; Kichloo *et al.*, 2020:1). There is a reduction in time to a definite diagnosis and prevention of misdiagnosis (Kichloo *et al.*, 2020:1). Some benefits include reducing patient transfer, rehospitalisation and length of stay (Bashshur *et al.*, 2016:367, 368). In addition, the quality of patient care has been enhanced. The feasibility and utility of teleradiology in rural hospital settings or resource-limited settings, particularly those with a heavy burden of patients with HIV and tuberculosis co-infection, has proven efficient, especially when the radiologist is conversant with local resources and health problems (Coulborn *et al.*, 2012:708).

Another consideration is the emergence of artificial intelligence. Participants admitted that they are using a computed radiography system. Artificial intelligence (AI) in healthcare is described as machine-learning algorithms and software to mimic human cognition in analysing, presenting and comprehending complex medical and health care data (Jiang *et al.*, 2017:230; Gampala *et al.*, 2020:1). Therefore, artificial intelligence can be explored in this setting for precisely these reasons: it requires digital data to mimic, broaden or enhance human knowledge (Gampala *et al.*, 2020:1). The literature agrees that developments in both imaging and computers have promoted artificial intelligence in different radiological imaging tasks, such as risk assessment, identification, diagnosis, prognosis, therapy response and risk of reoccurrence (Jiang *et al.*, 2017: 231; Hardy & Harvey, 2020).

Consequently, digital radiography or computed radiography undoubtedly allows artificial intelligence to be explored in resource-limited settings. According to Jiang *et al.* (2017:230), artificially intelligent systems extract helpful information from a large patient population to make real-time inferences for health risk alerts and health outcome prediction. Artificial intelligence uses refined algorithms to 'learn' features from a large volume of healthcare data and then relies on the obtained insights to assist clinical practice (Jiang *et al.*, 2017:230; Gampala *et al.*, 2020). Hence, the researcher advocates for the introduction of teleradiology and possibly artificial intelligence to alleviate the challenge of not having a radiologist on site to assist in the reporting of x-rays.

#### **4.4.3 Develop mentorship and orientation programmes for new staff**

Many organisations do not embrace the provision of embarking on a formal experience for new staff. The participants mentioned that they had to figure out how to operate one of the x-ray machines in one of the hospitals since there was no one to orientate them on how to handle the machine. They were newly employed without much experience in radiography, except that they had been to the department during their practical clinical training. A mentoring programme could have helped advance their early career and helped create an atmosphere of openness and support within the department (Bredella *et al.*, 2020). It is even more critical for healthcare leaders to integrate new practitioners into the organisation, especially where the healthcare delivery system is stretched during the recent global COVID-19 pandemic (Tay *et al.*, 2021:111). It is essential to understand the qualities of the new radiographers, more specifically, Generation Z. Generation Z are proficient in communicating in the digital world. Therefore, The Ministry of Health (MOH) or healthcare facility managers can utilise existing technological platforms such as video conferencing and online meetings to engage in the onboarding of radiographers. The main aim of an orientation programme is to decrease stress and enhance the transition from being supervised students to actual practitioners (Chipere & Nkosi, 2019:5; Chipere *et al.*, 2019:16; Bredella *et al.*, 2020; Tay *et al.*, 2021:104). Ideally, the orientation programme would assist to build relationships, providing necessary resources and essential training for newly qualified radiographers to be successful in the radiography clinical environment (Karimi *et al.*, 2014; Tay *et al.*, 2021:104).

The table 4.2 below is adapted from the work of Bredella *et al.*, (2020) and Tay *et al.*, (2021:104) provides a proposed programme that could be used for the orientation programme of newly qualified radiographers. Senior radiographers can facilitate these sessions with the assistance from external individuals who are considered experts in the field. With the use of technology, some of these sessions can be offered from individuals from other countries that have immense knowledge on CPD, patient safety and radiation protection.

**Table 4. 2 Orientation programme for newly employed radiographers**

Day	Topic	Contents
1	Introduction to MOH, Medical Imaging Services (MIS)  General radiography structure and administrative matters	1. Opening remarks 2. Organisational chart, policies and procedures  1. General radiography organizational chart and house rules 2. Overtime, public holidays and claims 3. Roster: working hours, sick leave, annual leave 4. Peer support 5. Habits of highly effective people
2	Health Profession Council supervision framework  Radiographers' career pathway  Quality management and risk management system	1. Types of registrations 2. Continuing professional development portfolio  1. Radiographers' clinical track and career progression  1. Patient safety culture strategy: learning from incidents in a risk management system
3	Radiography department policy and procedure  Infection control practices in radiology	1. Pregnancy rules 2. Assessment of a patient's condition 3. Handling of patients' valuables  1. COVID-19 infection control measures 2. Routine isolation measures 3. Proper use of personal protective equipment
4	General radiography protocol  Reflection and debriefing	1. Utilising protocol 2. Equipment maintenance and operation 3. Handling of hardcopy medical records

(Bredella *et al.*, 2020; Tay *et al.*, 2021:104)

#### **4.4.4 Delegate one radiographer to act as a Radiation Protection Officer (RPO)**

The participants enlightened the researcher on the lack of proper radiation monitoring and safety practices. They were specific about the lack of personnel monitoring dosimeters (TLDs). The use of radiation in the health sector is of incredible diagnostic and therapeutic benefit to patients. However, the scatter radiation associated with its use may bring detrimental risks to occupational staff. Effective monitoring of occupationally exposed health personnel is therefore essential (Okaro *et al.*, 2010:49; Nassef & Kinsara, 2017:1259-1260).

The researcher proposes the assignment of one radiographer to serve as a Radiation Protection Officer (RPO) for the whole country since there are only a few public sector radiology departments. The RPO is a person who is technically competent in radiation protection matters relevant for a given type of regulated activity or with regulated material (Ploussi & Efstathopoulos, 2016:145). The licensee designates a RPO to oversee the application of applicable requirements established in regulating radiation sources (Menechal & David, 2014). While the role of the RPO would be to have core information on protection and

safety as related to the field of radiography practice, this person must also have specific personal attributes, such as communication skills and leadership abilities (United Arab Emirates. Federal Authority for Nuclear Regulation, n.d:1). Furthermore, RPO individuals need analytical skills, human-machine interface skills and multitask management skills (United Arab Emirates. Federal Authority for Nuclear Regulation, n.d:1; Lakhwani *et al.*, 2018:742). In addition, the RPO should know applicable regulations.

#### **4.5 THEME 2: Council constraints**

##### **Guideline 2: Development of radiographic practice standards**

This theme demonstrated that radiographers are not represented within the health professions council, so their scope of practice is not clearly outlined, including standard operational procedures. Development of radiography practice standards will act as authoritative statements for measuring the quality of practice, service delivery and knowledge of the job (ASRT, 2019). Additionally, clearly defining the role of a radiographer and development of standard operational procedures falls within the responsibilities of a council. Each radiography department can nominate a radiographer to develop radiographic practice standards suitable for the country's environment. Thereafter all representatives can meet and nominate one or two individuals to present these standards to the medical and dental council of Eswatini.

Suggestions on how to implement this guideline are provided below.

##### **4.5.1 Appoint a council representative at regional level**

The researcher felt it imperative to appoint a council representative within each of the four geographical regions of the country. Radiographers belong to a team of professionals who regularly collaborate, ensuring that the requested medical procedures by physicians are carried out effectively and safely. Hence, professional organisations must be leaders and champions for the cause of quality care and patient safety (Lau, 2017). There is a medical and dental council in the country. The radiographers in the country should advocate for the appointment of someone to represent them in the council as it has been noted with the other allied professions i.e. pharmacy. The purpose of a council representative would be to ensure that radiography practice standards are adhered to as laid out in procedures. The representative must be someone who knows the role and responsibilities of a health professions council. Functions of a council representative include knowledge of the existence of a national registry of radiographers, the role of continuing professional development (CPD) and the necessity of holding a professional license (Hardy *et al.*, 2008:17; Prentakis *et al.*, 2016:2,4).

#### **4.5.2 Clearly define the role of a radiographer**

During the discussions, it emerged that radiographers assumed duties that are known to fall within the scope of a radiologist. They are aware of the unofficial adoption of some radiologist duties by radiographers in the departments. Before a radiographer applies radiation to a patient, the acceptable and ethical core task is to apply justification. This principle involves reviewing whether the benefits outweigh the risks associated with the requested examination. Medicolegal requirements by professional registration bodies identify justification of exposures as an advocated and obligatory practice for radiographers (Vom & Williams, 2017:212). Defining a radiographer's role would assist these practitioners in having a formally documented scope of practice. Additionally, the adoption of radiological tasks complicated by the lack of radiologists may be included as role extension with subsequent increased accountability and responsibility. Formal role expansion can develop a more dynamic and resourceful workforce with a stronger transferability of skills and attributes (Field & Snaith, 2013:11).

An abridged radiographic practice standard document to define the role of a radiographer would contain the following headings:

- Expectations from the radiographer
- Definition of the scope of practice
- Meeting the standards
- Requirements from registered radiographers

It is anticipated that the introduction of this practice standard would assist the referring physicians in understanding the roles of a radiographer. This in turn will reduce the request of procedures outside a radiographer's scope of practice.

#### **4.5.3 Develop a standard operational procedure for ordering consumables**

A standard operating procedure document (SOP) could be one guiding document to assist the radiographers during practice. During the interviews, participants mentioned that they lack an SOP on ordering consumables such as x-ray films from the pharmacy department. Amare (2012:205) and Bodur (2018:37) describe standard operating procedures as a set of written and detailed instructions that document a routine or repetitive activity followed by an organisation to achieve uniformity of the performance of a specific function. Akyar (2012:368) defines SOP as a process document that explains in detail how an operator should perform a given operation. Standard operating procedures ensure that the users follow consistent processes that meet best practice standards and that the procedures are reviewed and updated regularly inside and outside the same group of individuals (Hollmann *et al.*, 2020:1).

If appreciated and utilised as a component of an effective management system, the standard operating procedures will encourage transparent functions of the departments, implementing error prevention measures in the request of x-ray films. Additionally, they will facilitate corrective actions and transfer knowledge and skill on arranging x-ray consumables from the pharmacy department, as per the participants' words (Amare, 2012:205).

#### **4.6 THEME 3: Lack of Professional autonomy**

##### **Guideline 3: Encourage professional growth and development**

Literature suggests that changes in workplace culture should encourage radiographers to assent to a more autonomous role that cultivates critical thinking, reflection and research-informed decision making, including the principle of justification for the benefit of patients. The researcher felt the following strategies – (1) building a radiographer identity, (2) participation in CME and (3) radiographer representation in conferences and congresses – would encourage professional growth and development amongst the radiographers. Encouraging professional growth will bridge the gap from the lack of professional autonomy. The senior diagnostic radiographers, based on years of experience, must cultivate continuous learning culture to improve the existing knowledge and skills of junior diagnostic radiographers through participation in continuous development activities with other radiographers either from private practices or the region.

##### **4.6.1 Build a radiographer identity**

“The value of professional identity is an interesting territory to explore, relative to working in inter-professional teams and collaborative communities” (de Guzman & Angcahan, 2020:528). The identities created by the participants were direct reflections of their experiences of working alongside other health professionals, the health care system in which they operate and their functional role within the healthcare system (Decker, 2006:161). For this study, professional identity is defined as shared values, beliefs and knowledge that guide a radiographer's thinking, actions and interaction (Niemi & Paasivaara 2007; Karimi *et al.*, 2014:4; Fitzgerald, 2020:4, 22, 25). A professional group creates standards, accredits the qualification as a professional and assures a society of quality by shaping employee attitudes and ideas as identity (Hashimoto, 2006:126; Karimi *et al.*, 2014:3).

Literature reveals that radiology is a discipline that struggled to establish itself in the first two decades of the 20th century (Price and Paterson, 2020:185). To re-establish the lost prestige and demand of radiography, reflections on past and current experiences can help decompose



the radiographer's image from different standpoints (Mussmann *et al.*, 2021:1227; de Guzman & Angcahan, 2020: 530). To begin with, the language and terminology that radiographers use to describe themselves and duties performed must reflect the complexity of the profession (Mussmann *et al.*, 2021:1228). Radiographers need to raise radiography from its longstanding inferior place and re-position it as a specialist imaging field. Active participation in healthcare facility based activities, where radiographers would have an opportunity present items on behalf of the radiology department could be one example, such as the health workers wellness day. Being mindful may be an essential technique to enhance professionalism and allow greater satisfaction in radiography practice (Halpern & Spandorfer, 2014: 354). The participants clearly stated that they are not taken seriously within the public sector, both at the ministerial and healthcare facility level. Therefore, building their own identity is a start for shifting how their professional role and position are perceived.

#### **4.6.2 Participation in continuous professional development**

Each country develops continuous medical education programmes appropriate to the circumstances of its health service. The participants mentioned that they need refresher training. Continuing medical education (CME) in diagnostic radiography is a programme of educational activities to promote the maintenance and upgrading of knowledge, skills and competence following completion of graduate training (European Society of Radiology, 2004:3; Bwanga, 2020:473). Further to CME is continuous professional development (CPD), which is described as an ongoing professional activity in which a practitioner identifies, undertakes and evaluates learning appropriate to the maintenance and development of the highest standards of practice within an evolving scope of practice (Bwanga, 2020: 473). Participation in continuous professional development will offer motivation to acquire new knowledge, develop new skills of patient management, and ensure high quality of services (Hardy *et al.*, 2008:18; Prentakis *et al.*, 2016:3). Every patient should be confident that a radiographer with expertise in acquiring diagnostic quality images undertakes their examination. The heads of departments should always engage respective radiographers in identifying the areas of need for continuing education (Bwanga, 2020:477).

Bwanga (2020:478) proposes the following strategies to support radiographer participation in CPD learning activities which Eswatini radiographers could adopt:

- Tapping in radiographers' capabilities with lifelong learning skills during undergraduate training,
- Promoting CPD learning activities by professional bodies representing radiographers,
- Involving radiographers in identifying the areas interest for CPD study topics and events,

- Having specific time schedules for CPD activities during working hours,
- Having alternative procedures for CPD evidence recording: manual or online system;
- Alternating locations of CPD activities venues e.g., between urban and rural areas,
- Providing educational resources, including free Internet, to support CPD activities;
- Educating radiographers on what constitutes a CPD learning activity and providing a range of learning opportunities;
- Establishing journal clubs for sharing knowledge and disseminating information by profession bodies;
- Using social media for the dissemination of information;
- Collaborating of professional bodies with trade unions to advocate for increased staffing levels in the X-ray department; and
- Developing a CPD policy by hospital management for supporting radiographers.

The facilitation of CPD participation in Eswatini, can be through providing educational resources such as access to the Internet to allow radiographers to engage in CPD activities, educating radiographers on what constitutes a CPD learning activity and providing a range of learning opportunities.

#### **4.6.3 Encourage evidence-based practice in radiography**

Radiographer representation at conferences and congresses or even local meetings can also encourage professional growth and development for diagnostic radiographers. Therefore, evidence-based practice has become increasingly crucial for facilitating the transfer of research evidence into clinical practice. Saukko *et al.*, (2021:867,868) concur that radiography educational programmes are required to reflect the latest developments and respond to future healthcare needs.

The introduction of a combination of imaging techniques in one modality or image production has emerged as new imaging technology. Radiographers need to participate at conferences, congresses or local meetings to gain new imaging insights and align this knowledge to the local context to improve radiography practice. Evidence-based practice involves using the best available, current, valid, and relevant research evidence with clinical expertise and patient values in clinical decision-making to achieve optimal outcomes. Literature supports that engaging radiographers in radiography research and advancing radiographer-led research is crucial to staying abreast and adopting the most recent clinical practice (Saukko *et al.*, 2021:870, Lundvall *et al.*, 2021:441). Furthermore, active participation in conferences and joining a research group may provide excellent learning opportunities as well as help to

advance research skills, build up a valuable network with other researchers, and develop confidence in professional life (Saukko *et al.*, 2021:870).

#### **4.7. THEME 4: Sense of professional pride**

##### **Guideline 4: Create a supportive environment for radiographers**

Creating a supportive environment for the radiographers will be one step towards stirring a sense of professional pride. The radiographers could have monthly peer discussions or promote the profession through communication channels such as social media and other forums. Diagnostic Radiographers are encouraged to promote their professional identity through commemoration of the world radiography day and having open days where by the public can gain more knowledge about the profession. Establishing and engaging in team-building activities could strengthen unity amongst the radiographers. Additionally, having a dedicated tea or lunch room for socialising and de-stressing is yet another option to create a supportive environment for the radiographers. They can also promote their professional identity in different forums such as participation in planned activities by the ministry of health (i.e. commemoration of TB day, cancer awareness campaigns) including commemoration of the World Radiography Day.

##### **4.7.1 Have monthly peer discussions**

The radiographers will conduct monthly peer discussions to remove unwarranted variation in radiography practice. It emerged from the group interviews that diagnostic radiographers love their profession; however, they face a stagnation of professional growth. Peer discussions will improve consistency by providing opportunities to improve quality and patient experience through shared audit and governance processes. For the radiographers to improve the quality of their work, monthly peer discussions are an essential part of determining the credibility and quality of work rendered to the patients and encourage peer learning. The peer discussions will be reciprocally beneficial, as this involves peers sharing knowledge, ideas and experiences (Smith *et al.*, 2010:62). Additionally, peer discussions involve individuals from similar social groups helping each other learn, whilst learning themselves by providing help to each other to understand (Pålsson *et al.*, 2020:2). Literature supports that peer discussions offer the opportunity to practise and develop skills in collaboration (Pålsson *et al.*, 2020:2). The discussions would also encourage radiographers to strive to produce high-quality research that will advance the field of radiography (Kelly *et al.*, 2014:229). The currently volunteering lead radiographer in the public sector will facilitate the discussions either through virtual meetings

or request for a venue in one of the hospitals' boardrooms and sourcing support from country supporting agencies (i.e. WHO,AHF, T.B. programme, Cancer Programme).

#### **4.7.2 Dedicated tea/lunchroom for socialising and de-stressing**

A dedicated tea or lunchroom can bolster a supportive environment for the diagnostic radiographers. The staff will use the room for socialising and de-stressing, especially during this era of COVID. The Ottawa Charter for Health Promotion (Bazyk, 2018:1) claims that "Health is created and lived by people within the settings of their everyday life; where they learn, work, play and love".

Distress is defined by van Zoonen and Hoeven (2021:12) as a state of emotional suffering associated with stressors and demands that are difficult to cope with, such as high demands, work-related factors like poor support and lack of control. Job responsibilities, time pressure, workload, role ambiguity and regulations have been found to exacerbate the challenge and interference stressors (Karimi *et al.*, 2014; van Zoonen & Hoeven, 2021:12). A dedicated tearoom and break facilities will provide an area of rest and replenishment for the health care workers (Gordon *et al.*, 2021:282). However, as much as a staff tearoom is a critical resource to reducing staff fatigue, it can also contribute to health care workers infections through errors and breaches in routine practices of hand hygiene and doffing of PPE in this era of COVID (Gordon *et al.*, 2021:282). To prevent healthcare associated infections, the radiographers are encouraged to follow stipulated radiology department infection prevention procedures. This would include doffing in the identified area of staff changing rooms and washing or sanitising hands after each procedure before leaving the x-ray room.

#### **4.8 Conclusions**

In conclusion, the study's objectives were firstly to explore and describe the lived experiences of diagnostic radiographers working in the public sector in Eswatini. Secondly, it was to develop guidelines for radiographers to apply during practice. Literature demonstrates that research has been conducted previously to study the lived experiences of radiographers in diagnostic and therapeutic radiography in some other countries. The exploration revealed some negative experiences faced by diagnostic radiographers alongside a few positive experiences. The challenges faced by the diagnostic radiographers working in the public sector in Eswatini were congruent with findings from other studies (Ogenyi *et al.*, 2015; Thambura & Amusa, 2016; Britton *et al.*, 2017; Sibanda *et al.*, 2017; Khoza *et al.*, 2018). The study results revealed that radiographers face a challenging work environment where there is a constraint in both human (radiographers and radiologists) and material resources (consumables). The equipment

resources for conducting examinations were also identified as under capacity. Furthermore, remuneration is unsatisfactory, which is discouraging and demotivating to the radiographers who also must contend with stagnant professional career growth.

Radiographer responsibilities include patient care and safety, which they must practice and adhere to through proper radiation protection practices. Adherence to radiation protection, monitoring and safety fall within the scope of the radiation protection regulatory body. However, the participants did not mention anything concerning its availability in the country. Therefore, the study discovered a lack of proper radiation monitoring for the occupationally exposed radiographers in the public sector of Eswatini. Globally, health and care professions are regulated by a health and care professions council of that particular country. The role of a medical profession council is to set standards, hold a register, offer quality assurance of education, and investigate malpractice complaints. However, the study results revealed that Eswatini diagnostic radiographers face council constraints, including poor representation within the council's body and an ill-defined scope of practice. Furthermore, there are few guiding documents such as SOPs for the board to empower.

Literature supports that globally radiographers are struggling with recognition of the profession as autonomous practitioners. The study results reflected that Eswatini diagnostic radiographers experience the challenge of not being well recognised, not appreciated, and not having power or involvement in decision-making processes.

Regardless of the above findings, the study outcomes discovered a sense of professional pride amongst the participants. They shared expressions of loving their profession and good working experiences with great appreciation of teamwork amongst colleagues. The participants were proud of being frontline workers. Their contribution to diagnosis, management and monitoring of COVID-19 only strengthened the radiographers' love for their profession amid the prevailing challenges.

Finally, guidelines were developed to be used by the diagnostic radiographers during practice. The researcher believes that these guidelines, if implemented, would provide support to the diagnostic radiographers of Eswatini.

#### **4.9 Recommendations**

The result of the study highlights the importance of teamwork amongst professionals, especially smaller groups having the same goals, ambitions and working in a similar environment, coming together and shaping their unique practices in limited spheres.

The notion that radiographers are "button pushers" holds for this group of radiographers, yet eras have transformed. Therefore, the onus is on the radiographers to create their own identity within the environment through active participation in research, conferences and local meetings.

Evidence-based practice through the engagement and facilitation of continuous professional development (CPD) activities is strongly recommended for diagnostic radiographers.

The emergent results of this study can be explored for future research projects, especially for the evidence-based transformation of the radiography profession.

The results can be used to inform and upgrade the curriculum of the emerging medical university in the country.

#### **4.10 Limitations**

The focus of this research was confined to diagnostic radiographers working in the public sector of Eswatini. However, it can be extended to sonographers working in the same environment to determine whether they experience similar challenges and professional pride.

#### **4.11 My reflection of the study**

The process of completing this thesis has had a profound impact on my views regarding research and my profession. The research journey has been a positive experience and a great learning curve. Through this study, I have gained enormous knowledge about the radiography profession itself. Furthermore, by undertaking this research, I have gained vast knowledge about the research process and its fundamental requirements.

Practising reflexivity and bracketing has been one difficult fragment of the research process I had to practise with caution. Being in the position that I am in, that is, "acting leader or chief radiographer in the public sector", and having my own perceptions surrounding some of the stories told by the participants made it difficult to evade bias. I have learned that being a researcher is about gaining insights into the involved subject/s rather than one's own views, beliefs and perceptions. As I immersed myself in the stories told, I had to apply critical thinking analysis to decipher the true meaning of the participants' words rather than my assumptions and knowledge. Evidence-based knowledge and practice are what has technologically advanced most world states.

Reflecting on my journey in practice, I have discovered that I have been a participant in many studies taking place in the country. However, due to the limited research knowledge, I could not have taken the initiative and engaged in research myself to develop or establish the radiography profession in the country. Instead, I have narrowed by focusing on the operational politics and systems of the public sector rather than proactively gaining new knowledge about developments within my profession. Participation in research would have broadened my understanding of research. Therefore, I would begin to engage myself and gain academic knowledge and ideas for changing – and improving – my environment.

## REFERENCES

- Abele, A.E., Volmer, J. & Spark, D. 2011. The construct of career success: measurement issues and an empirical example. *Journal of Labour Market Research* 43: 195–206. <https://doi.org/10.1007/s12651-010-0034-6> AbeleVolmerSpurkCareerStagnation2012.pdf [25 May 2021].
- Aggarwal, R. & Ranganathan, P. 2019. Study designs: Part 2 – Descriptive studies. *Perspective Clinical Res*: 10:34-6. [https://www.picronline.org/temp/PerspectClinRes10134-538314\\_145711.pdf](https://www.picronline.org/temp/PerspectClinRes10134-538314_145711.pdf). [15 March 2021].
- Akyar, I. 2012. *Latest Research into Quality Control. Standard Operating Procedures (What Are They Good For?)* <http://dx.doi.org/10.5772/50439> [14 October 2021].
- Alhajeri, M. & Shah, S.G.S. 2019. Limitations in and Solutions for Improving the Functionality of Picture Archiving and Communication System: An Exploratory Study of PACS Professionals' Perspectives. *Journal of digital imaging*, 32(1):54-67. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6382637/pdf/10278\\_2018\\_Article\\_127.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6382637/pdf/10278_2018_Article_127.pdf) [29 July 2021].
- Allyn, J. 2020. *Embracing Diversity, Equity and Inclusion in Radiology*. <https://www.rsna.org/news/2020/october/diversity-equity-inclusion-initiatives>. [06 April 2021].
- Almalki A. A, Manaf R.A, Juni M.H & Shahar H.K. 2018. A Systematic Review on Radiographers' Knowledge in Imaging. *Journal of Medical Imaging and Health Informatics* 8(4):639-646. [https://www.researchgate.net/publication/325341988\\_A\\_Systematic\\_Review\\_on\\_Radiographers'\\_Knowledge\\_in\\_Imaging](https://www.researchgate.net/publication/325341988_A_Systematic_Review_on_Radiographers'_Knowledge_in_Imaging) [18 August 2019].
- Amare G. 2012. Reviewing the values of a standard operating procedure. *Ethiop J Health Sci*. 22:3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3511899/pdf/EJHS2203-0205.pdf> [14 October 2021].
- American Society of Radiologic Technologists. 2019. The ASRT Practice Standards for Medical Imaging and Radiation Therapy. *Radiography*. [https://www.asrt.org/docs/default-source/practice-standards/ps\\_rad.pdf?sfvrsn=13e176d0\\_24](https://www.asrt.org/docs/default-source/practice-standards/ps_rad.pdf?sfvrsn=13e176d0_24) [29 August 2021].
- Ashong, G.G.N.A., Rogers, H., Botwe, B. & Anim-Sampong, S. 2015. Effects of occupational stress and coping mechanisms adopted by radiographers in Ghana. October 2015. *Radiography* 22(2):112-117. [https://www.researchgate.net/publication/301650153\\_Effects\\_of\\_occupational\\_stress\\_and\\_coping\\_mechanisms\\_adopted\\_by\\_radiographers\\_in\\_Ghana](https://www.researchgate.net/publication/301650153_Effects_of_occupational_stress_and_coping_mechanisms_adopted_by_radiographers_in_Ghana). [06 June 2021].



- Awosan, K. J., Ibrahim, M., Saidu, S. A., Ma'aji, S. M., Danfulani, M., Yunusa, E. U., Ikhuenbor, D. B., & Ige, T. A. 2016. Knowledge of Radiation Hazards, Radiation Protection Practices and Clinical Profile of Health Workers in a Teaching Hospital in Northern Nigeria. *Journal of clinical and diagnostic research* 10(8): 07-12. <https://doi.org/10.7860/JCDR/2016/20398.8394> [29\_March 2021].
- Babenko, O., Koppula, S., Daniels, L., Nadon, L., & Daniels, V. 2017. Lifelong learning along the education and career continuum: meta-analysis of studies in health professions. *Journal of advances in medical education & professionalism*, 5(4): 157–163. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5611424/JAMP-5-157.pdf> [09 May 2021].
- Bashshur, R. L., Howell, J. D., Krupinski, E. A., Harms, K. M., Bashshur, N., & Doarn, C. R. 2016. The Empirical Foundations of Telemedicine Interventions in Primary Care. *Telemedicine journal and e-health: the official journal of the American Telemedicine Association*, 22(5): 342–375. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4860623/pdf/tmj.2016.0045.pdf> [26 September 2021].
- Bazyk, S., Demirjian, L., Horvath, F., & Doxsey, L. 2018. The Comfortable Cafeteria program for promoting student participation and enjoyment: An outcome study. *American Journal of Occupational Therapy*, 72. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5915230/pdf/7203205050p1.pdf> [18 November 2021]
- Bertone, M.P. & Witter, S. 2015. The complex remuneration of human resources for health in low-income settings: policy implications and a research agenda for designing effective financial incentives. *Human Resources for Health*, 13:62. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4517656/pdf/12960\\_2015\\_Article\\_58.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4517656/pdf/12960_2015_Article_58.pdf) [28 August 2021].
- Bodur, A. 2018. The need for standard operation procedures for unexpected events. *International Journal of Advanced Research*, 6(1): 37-41. [https://www.ijournalijar.com/uploads/402\\_IJAR-21402.pdf](https://www.ijournalijar.com/uploads/402_IJAR-21402.pdf) [14 October 2021].
- Botwe, B.O., Antwi, W.K., Adesi, K.K., Anim-Sampong, S., Dennis, A.M.E., Sarkodie, B.D. & Opoku, S.Y. 2015. Personal radiation monitoring of occupationally exposed radiographers in the biggest tertiary referral hospital in Ghana. *Safety in Health*, 1:17. [Radiation Monitoring of occupationally exposed radiographers.pdf](#) [28 March 2021].
- Boyd, K.M. 2003. Medical ethics: principles, persons, and perspectives: from controversy to conversation. *Journal of Medical Ethics* (2005) 31: 481–486. <https://jme.bmj.com/content/medethics/31/8/481.full.pdf> [5 February 2021].

- Brady, A.P. 2018. Radiology reporting—from Hemingway to HAL? *Insights into Imaging*, 9:237–246. <https://doi.org/10.1007/s13244-018-0596-> [17 September 2021].
- Braun, V. & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2): 77-101. <https://doi.org/10.1191/1478088706pq063oa> [22 June 2020].
- Braun V. & Clarke V. 2013. *Successful Qualitative Research. A practical guide for beginners*. Sage
- Bredella, M.A., Alvarez, C, Shaughnessy, S. A., DasLavigne, S., .Brink, J.A. & Thrall, J.H. 2021. Radiology Mentoring Program for Early Career Faculty—Implementation and Outcomes *Journal of the American College of Radiology*, 18(3):Part A: 451-456. <https://www.sciencedirect.com/science/article/abs/pii/S1546144020309686#> [03 November 2021].
- Britton, S.D., Pieterse, T. & Lawrence, H. 2017. The lived experiences of radiographers in Gauteng. *The South African Radiographer*, 55(1). <https://sar.org.za/index.php/sar/article/view/379> [06 August 2019].
- Bwanga, O., Mulenga, J. & Chanda, E. 2019. Need for Image Reporting by Radiographers in Zambia. *Medical journal of Zambia* 46(3):215–220. [https://www.researchgate.net/publication/342283216\\_Need\\_for\\_Image\\_Reporting\\_by\\_Radiographers\\_in\\_Zambia](https://www.researchgate.net/publication/342283216_Need_for_Image_Reporting_by_Radiographers_in_Zambia) [8 January 2021].
- Bwanga, O. 2020. Barriers to Continuing Professional Development (CPD) in Radiography: A Review of Literature from Africa. *Science Direct Health Professions Education* 6: 472e48. [www.sciencedirect.com](http://www.sciencedirect.com) <https://doi.org/10.1016/j.hpe.2020.09.002> [27 March 2021].
- Cacciattolo, M. 2015. *Ethical Considerations in Research*. [https://link.springer.com/chapter/10.1007/978-94-6300-112-0\\_4](https://link.springer.com/chapter/10.1007/978-94-6300-112-0_4) [05 November 2019].
- Chandler, & Munday, 2016. *A Dictionary of Media and Communication*. Online. 2<sup>nd</sup> Ed. <https://www.oxfordreference.com/view/10.1093/acref/9780199568758.001.0001/acref-9780199568758> [24 November 2019].
- Chaudhari, S., Sharma, S.D. & Shrivastava, S.K. 2020 Revision in standard operating procedures of radiation oncology department and quality assurance schedule under COVID-19 pandemic. *Journal of Medical Physics*, 45:130-3. Wolters Kluwer <https://www.jmp.org.in/text.asp?2020/45/2/130/290223>. [06 June 2021].
- Cheung, K.Y. 2013. *Establishing a Radiation Safety Culture in Health Care*. 2nd WHO Global Forum on Medical Devices. Geneva 22-24 November 2013. [https://www.who.org/Workshop\\_22\\_Medical\\_physics\\_3.pdf](https://www.who.org/Workshop_22_Medical_physics_3.pdf) [04 April 2021].
- Chen, H., Li, A., Lu, H. & Li H. 2020. Clinical and imaging features of COVID-19. *Radiology of Infectious Diseases*, 7: 43-50.

- <https://reader.elsevier.com/reader/sd/pii/S2352621120300346-main.pdf> [19 July 2021].
- Chipere, T.G.A. & Nkosi, P. B. 2019. Reality shock in radiography: fact or fiction? Findings from a phenomenological study in Durban, South Africa. *BMC Psychology*, 7:40. <https://doi.org/10.1186/s40359-019-0317-9> [22 August 2019].
- Chipere, T.G.A., Motaung, T. & Nkosi, B. 2019. Structuring improved work environments for newly-qualified radiographers. *Radiography* 26: 14-17. Elsevier Ltd. <https://www.radiographyonline.com/action/showPdf?pii=S1078-8174%2819%2930087-2> [26 October 2021].
- Clarke, V. & Braun, V. 2016. Thematic analysis. *Journal of Positive Psychology*, 12(3): 297–298. <https://www.tandfonline.com/doi/full/10.1080/17439760.2016.1262613> [24 July 2020].
- Copete, A.M.G. & Hernandez, D.B.P. 2012 Basic ethical considerations and principles in the development of Biomedical research and Gastroenterology. *Rev Col Gastroenterology*, 27(4): 329-334. [http://www.scielo.org.co/pdf/rcg/v27n4/en\\_v27n4a12.pdf](http://www.scielo.org.co/pdf/rcg/v27n4/en_v27n4a12.pdf) [11 January 2020].
- Coulborn, R.M., Panunzi, I., Spijker, S., Brant, W.E., Duran, L.T., Kosack, C.S. & Murowa, M.M. 2012. Feasibility of using teleradiology to improve tuberculosis screening and case management in a district hospital in Malawi. *Bull World Health Organ*, 90:705–711. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3442390/pdf/BLT.11.099473.pdf> [24 October 2021].
- Cowling, C. 2008. A global overview of the changing roles of radiographers. *Radiography*, 14: 28-32. [https://www.radiographyonline.com/article/S1078-8174\(08\)00058-8/pdf](https://www.radiographyonline.com/article/S1078-8174(08)00058-8/pdf) [17 February 2020].
- Creswell, J.W. & Creswell, J.D. 2018. *Research Design. Qualitative, Quantitative, and Mixed Methods Approaches*. 5<sup>th</sup> edition. <https://us.sagepub.com/en-us/nam/research-design/book255675> [17 June 2020].
- Cuthbertson, L.M., Robb, Y.A. & Blair S. 2020, May. Theory and application of research principles and philosophical underpinning for a study utilising interpretative phenomenological analysis. *Radiography*, 26(2):94-102. [https://linkinghub.elsevier.com/retrieve/pii/S1078-8174\(19\)30254-8](https://linkinghub.elsevier.com/retrieve/pii/S1078-8174(19)30254-8) [04 April 2019].
- Davis, C. 2014. The importance of professional standards. *Nursing Made Incredibly Easy*, 12(5):4. [https://journals.lww.com/nursingmadeincrediblyeasy/fulltext/2014/09000/the\\_importance\\_of\\_professional\\_standards.1.aspx](https://journals.lww.com/nursingmadeincrediblyeasy/fulltext/2014/09000/the_importance_of_professional_standards.1.aspx) [05 December 2021].
- Decker, S. 2006. On Being a Radiographer: Identity Construction and the Radiographer. *Narrative, Memory and Knowledge: Representations, Aesthetics, Contexts*. University of Huddersfield, 59-164. [http://www2.hud.ac.uk/hhs/nme/books/2006/Chapter\\_1...](http://www2.hud.ac.uk/hhs/nme/books/2006/Chapter_1...) [26 October 2021].

- Decker, S. 2009. The lived experience of newly qualified radiographers (1950-1985): An oral history of radiography. *Radiography*, 15(7). [https://www.radiographyonline.com/article/S1078-8174\(09\)00094-7/fulltext](https://www.radiographyonline.com/article/S1078-8174(09)00094-7/fulltext) [26 October 2021].
- de Guzman, A.B. & Angcahan D. 2020. Caeteris paribus: In search of the “Silent Professional Identity” of Filipino radiologic technologists during the COVID-19 pandemic. *Journal of Medical Imaging and Radiation Sciences*, 51: 528-530. Elsevier Inc. <https://doi.org/10.1016/j.jmir.2020.08.006> [06 October 2021].
- Department of Health. 2014. *Directorate: Radiation Control. Policy on the request for medical x-ray examinations and guidelines for making request for medical x-rays*. <https://hpcsa.co.za> [21 March 2021].
- Dhoot, R., Humphrey, J. M., O'Meara, P., Gardner, A., McDonald, C. J., Ogot, K., Antani, S., Abuya, J., & Kohli, M. 2018. Implementing a mobile diagnostic unit to increase access to imaging and laboratory services in western Kenya. *BMJ Global Health*, 3(5): e000947. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6195141/pdf/bmjgh-2018-000947.pdf> [04 April 2021].
- Dlamini, L. & Kekana, M. 2020. Perceptions of radiographers regarding establishing a self-regulatory body for radiation safety in Eswatini. *Radiography*: 27 (2) (2021) 627-632. [https://www.radiographyonline.com/article/S1078-8174\(20\)30254-6/fulltext](https://www.radiographyonline.com/article/S1078-8174(20)30254-6/fulltext) [05 May 2021].
- Dörfler, V. & Stierand, M. 2020. Bracketing: a phenomenological theory applied through transpersonal reflexivity. *Journal of Organizational Change Management*, 34. [https://strathprints.strath.ac.uk/73593/1/Dorfler\\_Stierand\\_JOCM\\_2020\\_Bracketing\\_a\\_phenomenological\\_theory\\_applied.pdf](https://strathprints.strath.ac.uk/73593/1/Dorfler_Stierand_JOCM_2020_Bracketing_a_phenomenological_theory_applied.pdf)
- Ebdon-Jackson, S. & Frija, G. 2020. Improving justification of medical exposures using ionising radiation: considerations and approaches from the European Society of Radiology. *Insights Imaging*, 12:2. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7788115/pdf/13244\\_2020\\_Article\\_940.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7788115/pdf/13244_2020_Article_940.pdf) [04 June 2021].
- Essop, H. & Kekana, M. 2020. The experiences of teleradiology end users regarding role extension in a rural district of the North West province: A qualitative analysis. *Africa Journal of Primary Health Care and Family Medicine*, 12(1): 2227. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7136798/> [02 November 2020].
- Eswatini Government. 2014. *Ministry of Health: Second National Health Sector Strategic Plan 2014-March 2018*. Mbabane Ministry of Health.
- Eswatini Government. Legal Notice of 2020. *The Disaster Management (Corona virus COVID-19) Regulations 2020*. <http://www.gov.sz/images/CORONA/regulations2020.pdf> [22 March 2021]

- European Society of Radiology (ESR). 2004. CME/CDP Guidelines III. Publications & Media. Neutorgasse 9/2a / AT-1010 Vienna, Austria. [https://ESR\\_brochure\\_03\\_0.pdf](https://ESR_brochure_03_0.pdf) [14 October 2021].
- European Society of Radiology (ESR) & European Federation of Radiographer Societies (EFRS). 2019. Patient Safety in Medical Imaging: a joint paper of the European Society of Radiology (ESR) and the European Federation of Radiographer Societies (EFRS). *European Society of Radiology (ESR) Insights into Imaging*, 10:45. <https://doi.org/10.1186/s13244-019-0721-> [29 July 2021].
- European Society of Radiology (ESR). 2020. Performance indicators for radiation protection management: suggestions from the European Society of Radiology. *Insights Imaging*, 11:134. <https://doi.org/10.1186/s13244-020-00923-1> [03 April 2021].
- Farias, L.P.G., Fonseca, E.K.U.N., Strabelli, D.G., Loureiro, B.M.C., Neves, Y.C.S. & Rodrigues T.P. 2020. Imaging findings in COVID-19 pneumonia. *Clinics*, 75: e2027. <https://www.scielo.br/pdf/clin/v75/1807-5932-clin-75-e2027.pdf> [13 May 2021].
- Field, L. J. & Snaith, B. A. 2013. Developing radiographer roles in the context of advanced and consultant practice. *Journal of medical radiation sciences*, 60(1): 11–15. Wiley Publishing. <https://doi.org/10.1002/jmrs.2> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4175793/> [24 October 2021].
- Fitzgerald, A. 2020. Professional identity: A concept analysis. *Nursing Forum*, 1–26. Wiley *Periodicals online*. [https://www.researchgate.net/publication/340458105\\_Professional\\_identity\\_A\\_concept\\_analysis](https://www.researchgate.net/publication/340458105_Professional_identity_A_concept_analysis) [06 October 2021].
- Flemming, K., Booth, A., Garside, R., Tuncalp, O. & Noyes, J. 2018. Qualitative evidence synthesis for complex interventions and guideline development: clarification of the purpose, designs, and relevant methods. *British Medical Journal of Global Health* 2019, 4: e000882. <https://eprints.whiterose.ac.uk/125099/1/1-s2.0-S0895435617313276-main.pdf> [09 March 2020].
- Fleming J, Zegwaard K, 2018. Methodologies, methods and ethical considerations for conducting research in work-integrated learning. *International Journal of Work-Integrated Learning, Special Issue*, 2018, 19(3), 205-213. <https://files.eric.ed.gov/fulltext/EJ1196755.pdf> [28 October 2022].
- Frija-Masson, J., Debray, M.P., Boussoar, S., Khalil, A., Bancal, C., Motiejunaite, J., Galarza-Jimenez, M.A., Benzaquen, H., Penaud, D., Laveneziana P., Malrin, R., Redheuil, A., Donciu, V., Lucidarme, O., Taillé, C., Guerder. A., Arnoult, F., Vidal-Petiot. E., Flamant, M., Similowski, T., Morelot-Panzini, C., Faure, M., Lescure, F.X., Straus, C., d'Ortho, M.P. & Gonzalez-Bermejo, J. 2021. Residual ground glass opacities three months after Covid-19

- pneumonia correlate to alteration of respiratory function: The post Covid M3 study. *Respiratory Medicine*, Aug, 184:106435. Epub 2021 May 15.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7682942/> [31 July 2021].
- Frija, G., Blazic, I., Frush, D.P., Hierath, M., Kawooya, M., Donoso-Bach, L., Brkljacic B. 2021. How to improve access to medical imaging in low- and middle-income countries? *EClinical Medicine* 38 (2021) 101034. <https://doi.org/10.1016/j.eclinm.2021.101034> [31 July 2021].
- Gampala, S, Vankeshwaram, V. & Gadula S.S.P. 2020, Oct. Is Artificial Intelligence the New Friend for Radiologists? A Review Article. *Cureus*, 12(10): e11137.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7682942/pdf/cureus-0012-00000011137.pdf>  
 [02 November 2021].
- Given, L. M. 2008. Lived experience. *The SAGE Encyclopaedia of Qualitative Research Methods*.  
<https://methods.sagepub.com/reference/sage-encyc-qualitative-research-methods/n250.xml>  
 [19 August 2020].
- Goodman R.A., Rothstein M.A. & Hoffman R.E. 2003. *Law in Public Health Practice*.  
<https://books.google.com>books> [11 January 2020].
- Ghiasipour. M., Mosadeghrad, A.M., Arab, M. & Jaafaripooyan, E. 2017, Dec. Leadership challenges in health care organizations: The case of Iranian hospitals. *Medical Journal of Islam Republic of Iran*, 31:96.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6014751/pdf/mjiri-31-96.pdf> [13 September 2021].
- Gordon, C.L., Trubiano, J.A., Holmes, N.E., Chua, K.Y.L., Feldman, J., Young, G., Sherry, N.L., Grayson, M.L. & Kwong J.C. 2021. Staff to staff transmission as a driver of healthcare worker infections with COVID-19. *Infection, Disease & Health*, 26: 276-283.  
<http://www.journals.elsevier.com/infection-disease-and-health/> [27 October 2021].
- Gow, J., George, G., Mwamba, S., Ingombe, L., & Mutinta, G. 2012. Health Worker Satisfaction and Motivation: An Empirical Study of Incomes, Allowances and Working Conditions in Zambia. *International Journal of Business and Management*, 7(10).  
[https://www.ccsenet.org/ijbm/Health\\_Worker\\_Satisfaction\\_and\\_Motivation\\_An\\_Empir.pdf](https://www.ccsenet.org/ijbm/Health_Worker_Satisfaction_and_Motivation_An_Empir.pdf) [02 August 2021].
- Gunawan, J. 2015. Ensuring trustworthiness in qualitative research. *Belitung Nursing*, 12(1):10-11.  
[https://www.researchgate.net/publication/331213078\\_Ensuring\\_trustworthiness\\_in\\_qualitative\\_research](https://www.researchgate.net/publication/331213078_Ensuring_trustworthiness_in_qualitative_research) [19 October 2019].
- Gupta, M., Singh N., Shrivastava, K. & Mishra, P. 2015. Significance of digital imaging and communication in medicine in digital imaging. *Digital Medicine*, 1:63-6.  
<http://www.digitmedicine.com/text.asp?2015/1/2/63/174769> [29 July 2021].

- Hardy M. & Harvey H. 2020. Artificial intelligence in diagnostic imaging: impact on the radiography profession. *British Journal of Radiology*, (93). <https://doi.org/10.1259/bjr.20190840>. [ 20 July 2021].
- Hardy, M., Snaith, B. & Smith, T. 2008. Radiographer reporting of trauma images: United Kingdom experience and the implications for evolving international practice. *The Radiographer*, 55(1): 16–19. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/j.2051-3909.2008.tb00078.x> [13 July 2021].
- Hashimoto, N. 2006. Professional Autonomy. *Japan Medical Association Journal*, 49(3):125-127. [https://www.med.or.jp/english/pdf/2006\\_03/125\\_127.pdf](https://www.med.or.jp/english/pdf/2006_03/125_127.pdf) [24 October 2021].
- Halpern, E.J. & Spandorfer, J.M. 2014. *Professionalism in Radiology: Ideals and Challenges*. <https://www.ajronline.org/doi/pdf/10.2214/AJR.13.11342> [14 October 2021].
- Health and Care Professions Council. 2011-13. <https://www.hcpc-uk.org/globalassets/resources/reports/cpd-audit-report/continuing-professional-development-audit-report-2011-13.pdf> [09 May 2021].
- Health and Care Professions Council. 2013. *Radiographers. The standards of proficiency for radiographers*. <https://www.hcpc-uk.org/resources/standards/standards-of-proficiency-radiographers/> [09 May 2021].
- Health Professions Council of South Africa. Professional Board for Radiography and Clinical technology. 2020. Scope of practice: diagnostic radiography. [https://www.hpcsa/Approved\\_Scope\\_of\\_Practice%20Diagnostic\\_Radiography\\_21\\_May\\_2020.pdf](https://www.hpcsa/Approved_Scope_of_Practice%20Diagnostic_Radiography_21_May_2020.pdf) [24 May 2021].
- Hollmann, S., Frohme, M., Endrullat, C., Kremer, A., D'Elia, D. & Regierer, B. 2020 Ten simple rules on how to write a standard operating procedure. *PLoS Computational Biology*, 16(9): e1008095. <https://doi.org/10.1371/journal.pcbi.1008095> [14 October 2021].
- Holloway, I. & Wheeler, S. 2010. *Qualitative Research in Nursing and Healthcare*. 3rd ed. United Kingdom. Wiley-Blackwell. [https://books.google.com/books/about/Qualitative\\_Research\\_in\\_Nursing\\_and\\_Heal.html?id=8AP3sCg1kdYC](https://books.google.com/books/about/Qualitative_Research_in_Nursing_and_Heal.html?id=8AP3sCg1kdYC) [05 March 2020].
- Hricak H., Abdel-Wahab, M., Atun, .R, Lette, M.M., Paez, D., Brink, J.A., Donoso-Bach, L., Frijia, G., Hierath, M., Holmberg, O., Khong, P.L., Lewis, J.S., McGinty, G., Oyen, W.J.G., Shulman, L.N., Ward, Z.J. & Scott, A.M. 2021. Medical imaging and nuclear medicine: a Lancet Oncology Commission. *Lancet Oncology*, 22(4):136-172. <https://pubmed.ncbi.nlm.nih.gov/33676609/>
- Hutton, D., Beardmore, C., Patel, I., Massey, J., Wong, H. & Probst, H. 2014. Audit of the job satisfaction levels of the UK radiography and physics workforce in UK radiotherapy centres

2012. *British Journal of Radiology*, 83:20130742.

<https://www.birpublications.org/doi/epdf/10.1259/bjr.20130742> [02 August 2021].

Jeanfreau, S.G. & Jack, L. J. 2010. Appraising qualitative research in health education: guidelines for public health educators. *Health Promotion Practise*, 11(5): 612–617.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3012622/> [19 October 2019].

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., Wang, Y., Dong, Q., Shen, H, & Wang, Y. 2017. Artificial intelligence in healthcare: past, present and future. *Stroke and Vascular Neurology*, 2: e000101. <https://svn.bmj.com/> [25 September 2021].

Jiang, Z. Z., He, C., Wang, D. Q., Shen, H. L., Sun, J. L., Gan, W. N., Lu, J. Y. & Liu, X. T. 2020.

The Role of Imaging Techniques in Management of COVID-19 in China: From Diagnosis to Monitoring and Follow-Up. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, 26: e924582. <https://doi.org/10.12659/MSM.924582> [19 July 2021].

Johnson, J.L., Adkins, D. & Chauvin, S. 2020. Qualitative research in pharmacy education. A Review of the Quality Indicators of Rigor in Qualitative Research. *American Journal of Pharmaceutical Education*, 84(1): e7120.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7055404/pdf/ajpe7120.pdf> [10 August 2021].

Johnson, A.R., Jayappa, R., James, M., Kulnu, A., Kovayil, R., & Joseph, B. 2020, Sep. Do Low Self-Esteem and High Stress Lead to Burnout Among Health-Care Workers? Evidence from a Tertiary Hospital in Bangalore, India. *Safe Health Work*, 11(3): 347-352. .

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7502605/pdf/main.pdf> [06 August 2021].

Kajungu, T.M. & Mugisha, J.F. 2015. Role of remuneration in retention of health workforce in a rural district setting in Uganda. *International Journal of Public Health Research*, 3(1): 94-100.

<http://www.openscienceonline.com/journal/ijphr> [06 April 2021].

Karimi, S., Mohammadinia, L., Mofid, M., Javadi, M. & Torabi, R. 2014 .The relationship between sociability and productivity. *Journal of Education in Health Promotion*, 3:104.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4165111/pdf/JEHP-3-104.pdf> [24 October 2021].

Kelly, J., Sadeghieh, T. & Adeli, K. 2014. Peer Review in Scientific Publications: Benefits, Critiques, & a Survival Guide. *The Journal of the International Federation of Clinical Chemistry and Laboratory Medicine*, 25(3): 227–243.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4975196/pdf/ejifcc-25-227.pdf> [27 October 2021].

Kenton, W. 2019. First World. <https://www.investopedia.com/terms/f/first-world.asp> [09 March 2020].



- Kekana, R.M., Swindon, L.D. & Mathobisa, J.M. 2015. A survey of South African Radiographers' and Radiologists' opinions on role extension for radiographers. *African Journal for Physical, Health Education, Recreation and Dance (AJPHERD)*, 21(4:1): 1114-1125. <https://hdl.handle.net/10520/EJC182200> [05 November 2019].
- Khine, R.N.M. & Stewart-Lord, A. 2021. An examination of Advanced Clinical Practice: Qualitative insights from therapeutic radiography advanced and consultant practitioners based in England. *Technical Innovations & Patient Support in Radiation Oncology*, 17: 97–101. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8110936/pdf/main.pdf> [06 July 2021].
- Khoza, T. Pieterse, T. & Motto J. 2018. Factors affecting job satisfaction for radiographers in Gauteng, South Africa. *The South African Radiographer*, 56(1):26-30. <https://www.researchgate.net/publication/325712276> [14 August 2019].
- Khoza T.E., Sibiya M.N., Nkosi B.P. 2020. A model to enhance job satisfaction for radiographers in the public healthcare system in Gauteng province, South Africa. *Radiography (Lond)*. 2021 Feb, 27(1):120-126. Epub 2020 Jul 23. PMID: 32713822. <https://pubmed.ncbi.nlm.nih.gov/32713822/> [14 August 2021].
- Kichloo, A., Albosta, M., Dettloff, K., Wani, F., El-Amir, Z., Singh, J., Aljadah, M., Chakinala, R. C., Kanugula, A. K., Solanki, S. & Chugh, S. 2020. Telemedicine, the current COVID-19 pandemic and the future: a narrative review and perspectives moving forward in the USA. *Family Medicine and Community Health*, 8(3): e000530. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7437610/pdf/fmch-2020-000530.pdf> [17 September 2021].
- Korstjens, I. & Moser, A. 2017 Series: Practical guidance to qualitative research. Part 2: Context, research questions and designs. *European Journal of General Practice*, 23(1): 274-279. <https://www.tandfonline.com/doi/full/10.1080/13814788.2017.1375090> [09 March 2020].
- Korstjens, I. & Moser, A. 2018. Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1): 120-124. <https://www.tandfonline.com/doi/full/10.1080/13814788.2017.1375092> [06 January 2020].
- Lakhwani, O.P., Dalal, V., Jindal, M. & Nagala A. 2018. Radiation protection and standardization. *Journal of Clinical Orthopaedics and Trauma*, 10: 738-743. [www.elsevier.com/locate/jcot](http://www.elsevier.com/locate/jcot) [02 November 2021].
- Lau, L.S. 2007. Leadership and management in quality radiology. *Biomedical Imaging and Intervention Journal*, 3(3): e21. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3097676> [14 August 2019].

- Lehmann, P., Meystre, N. R., & Mamboury, N. 2015. Factors for lifelong job retention among Swiss radiographers. 2015. *Radiography*, 21: 181-187. <http://dx.doi.org/10.1016/j.radi.2014.11.002> [21 November 2021].
- Lewis, S. & Mulla F. 2020. Diagnostic radiographers' experience of COVID-19, Gauteng South Africa. *Radiography*, 27: 346-351. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7500947/pdf/main.pdf> [19 July 2021].
- Li, B., Li, X., Wang, Y., Han, Y., Wang, Y., Wang, C., Zhang, G., Jin, J., Jia, H., Fan, F., Ma, W., Liu, H. & Zhou, Y. 2020, Dec. Diagnostic value and key features of computed tomography in Coronavirus Disease 2019. *Emerging Microbes Infections*, 9(1):787-793. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7191895/pdf/TEMI\\_9\\_1750307.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7191895/pdf/TEMI_9_1750307.pdf) [12 October 2021].
- Lohikoski, K., Roos, M. & Suominen, T. 2019. Workplace culture assessed by radiographers in Finland. *Radiography*, 25(4): E113-E118. [https://www.radiographyonline.com/article/S1078-8174\(19\)30060-4/fulltext](https://www.radiographyonline.com/article/S1078-8174(19)30060-4/fulltext) [06 July 2021].
- Lundvall, L. 2019. Radiography in Practice. Work and Learning in Medical Imaging. Linköping University Medical dissertations, No. 1664. <https://www.diva-portal.org/smash/get/diva2:1293973/FULLTEXT01.pdf> [17 May 2021].
- Lundvall, L., Dahlström, N. & Dahlgren, M.A. 2021. Radiography Students' Learning During Clinical Placements: Developing Professional Knowing in Practice. *Vocations and Learning*, 14:439–457. <https://link.springer.com/article/10.1007/s12186-021-09269-1> [18 October 2021].
- Luntsi, G., Muhammed, R., Nwobi, I.C., Njiti, M. & Nkubli, F.B. 2015. Radiography Profession: Regulation, Practice and Challenges in Northern Nigeria. *Journal of the Nigeria Association of the Radiographers of Nigeria*, 29: 1-8. [https://www.researchgate.net/publication/320012134\\_Radiography\\_Profession\\_Regulation\\_Practice\\_and\\_Challenges\\_in\\_Northern\\_Nigeria/citation/download](https://www.researchgate.net/publication/320012134_Radiography_Profession_Regulation_Practice_and_Challenges_in_Northern_Nigeria/citation/download) [15 February 2020].
- Maboreke, T., Banhwa, J. & Pitcher, R.D. 2019. An audit of licensed Zimbabwean radiology equipment resources as a measure of healthcare access and equity. *Pan African Medical Journal*, 1(34):60. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6859023/pdf/PAMJ-34-60.pdf> [07 July 2020].
- Mafini, C. & Dlodlo, N. 2014. The relationship between extrinsic motivation, job satisfaction and life satisfaction amongst employees in a public organisation. *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde*, 40(1): Art. #1166, 13 pages. <http://dx.doi.org/10.4102/sajip.v40i1.1166> [27 October 2021].

- Maharjan, S., Parajuli, K., Sah, S. & Poudel U. 2020. Knowledge of radiation protection among radiology professionals and students: A medical college- based study. *European Journal of Radiology Open*, 7: 100287. <https://doi.org/10.1016/j.ejro.2020.100287> [29 March 2021].
- Makanjee C.R., Hartzler Y.F. & Uys I.L. 2005. The effect of perceived organizational support on organizational commitment of diagnostic imaging radiographers. *Radiography*, 12: 118e126. Elsevier. <https://www.radiography/onlinej/1-s2.0-S107881740500060X-main.pdf> [04 September 2020].
- Malone J., Gulera R., Craven C., Horton P., Jarvinen H., Mayo J., O'Reilly G., Picano E., Remedios D., LeHeron J., Rehani M., Holmberg O. & Czarwinski R. 2012. Justification of diagnostic medical exposures: some practical issues. Report of an International Atomic Energy Agency Consultation. *British Journal of Radiology*, 85(1013):523-538. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC21343316/bjr-85-523.pdf> [22 August 2021].
- Malone J. & Zolzer F. 2016. Pragmatic ethical basis for radiation protection in diagnostic radiology. *British Journal of Radiology*, 89: 20150713. British Institute of Radiology. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4986491/pdf/bjr.20150713.pdf> [17 February 2021].
- Mariani, G., Kasznia-Brown, J., Paez, D., Mikhail, M.N., Salama, D.H., Bhatla, N., Erba, P.A. & Kashyap, R. 2017. Improving women's health in low-income and middle-income countries. Part II: the needs of diagnostic imaging. Nuclear Medicine. *Communications*, 38(12):1024-28 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5704652/pdf/mnm-38-1024.pdf> [04 April 2021].
- Mardliyyah, A. Sensusiati, A.D. & Sari, A.K. 2020. Role of radiographer in handling COVID-19 at CT Scan Room during pandemic. *Journal of Vocational Health Studies*, 04: 83-88. <http://dx.doi.org/10.20473/jvhs.V4.I2.2020.83-88> [19 July 2021].
- McCall, I. 2010, Jan. The future role of radiology in healthcare. *Insights Imaging*, 1(1): 2–11. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3259353/#\\_ffn\\_sectitle](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3259353/#_ffn_sectitle). [12 November 2019].
- McLaughlin, K., Leigh, J., & Worsley, A. 2015. The State of Regulation in England: From the General Social Care Council to the Health and Care Professions Council. *British Journal of Social Work*, 46(4): 825–838. <https://doi.org/10.1093/bjsw/bcv030>. [30 May 2021].
- Menechal P.H. & David C. 2014. *Importance of the radiation safety officer in the optimisation of occupational doses*. [https://www.eualara.net/images/stories/pdf/program6/Session%20F/P\\_Menechal.pdf](https://www.eualara.net/images/stories/pdf/program6/Session%20F/P_Menechal.pdf) [04 November 2021].

- Merriam, S. B. & Tisdell, T.J. 2016. *Qualitative Research: A Guide to Design and Implementation*. 4th Edition. Jossey-Bass.  
<https://www.wiley.com/engb/Qualitative+Research:+A+Guide+to+Design+and+Implementation,+4th+Edition-p-9781119003618> [06 May 2020].
- Mohajan, H. 2018. Qualitative Research Methodology in Social Sciences and Related Subjects. *Journal of Economic Development, Environment and People*, 7(01): 23-48.  
[https://mpra.ub.uni-muenchen.de/85654/1/MPRA\\_paper\\_85654.pdf](https://mpra.ub.uni-muenchen.de/85654/1/MPRA_paper_85654.pdf) [29 November 2020]
- Mohammad, S.A., Osman, A.M., Abd-Elhameed, A.M., Ahmed, K.A., Taha, N.M., Saleh, A., Omar, A., El-Meteini, M. & Mohamed, M.A. 2020. The battle against Covid-19: the experience of an Egyptian radiology department in a university setting. *Egyptian Journal of Radiology and Nuclear Medicine*, 51: 216.  
<https://ejrnm.springeropen.com/articles/10.1186/s43055-020-00335-7> [04 April 2021].
- Muhammad, B, Muhammad, T.A. & Muhammad, A. 2008. Reliability and Validity of Qualitative and Operational Research Paradigm. *Pakistan Journal of Statistics and Operational Research*, 4(1): 35-45.  
[https://www.researchgate.net/publication/44286439\\_Reliability\\_and\\_Validity\\_of\\_Qualitative\\_and\\_Operational\\_Research\\_Paradigm](https://www.researchgate.net/publication/44286439_Reliability_and_Validity_of_Qualitative_and_Operational_Research_Paradigm) [12 November 2019].
- Muhogora, W. & Rehani, M. M. 2017. Review of the current status of radiation protection in diagnostic radiology in Africa. *Journal of Medical Imaging (Bellingham, Wash.)*, 4(3): 031202.  
<https://doi.org/10.1117/1.JMI.4.3.031202> [24 March 2021].
- Mung'omba, B. & Botha, A.D.H. 2017. Core competencies of radiographers working in rural hospitals of KwaZulu-Natal, South Africa. *African Journal of Primary Health Care & Family Medicine*, 9(1): a1389.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5594238/pdf/PHCFM-9-1389.pdf> [13 July 2021].
- Mussmann, B.R., Hardy, M. & Jensen, J. 2021. There's nothing plain about projection radiography! A discussion paper. *Radiography*, 27: 1227e1230.  
<https://www.radiographyonline.com/action/showPdf?pii=S1078-8174%2821%2900082-1> [31 July 2021].
- Nassef, M.H. & Kinsara, A.A. 2017. Occupational Radiation Dose for Medical Workers at a University Hospital. *Journal of Taibah University for Science*, 11: 1259–1266.  
<https://reader.elsevier.com/reader/sd/pii/S1658365517300043?token=419318CF147D7C1BE04EB435AC79D9635A4985A1D6B82C63018339A87C7ED5D13F3FFBC45243A83769785B5F3E711F5E&originRegion=eu-west-1&originCreation=20220130045931> [09 March 2021].

- Naylor S., Booth S., Harvey-Lloyd J., Strudwick R. 2021. Experiences of diagnostic radiographers through the Covid-19 pandemic. *Radiography*, 28(2022): 187-192. Elsevier.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8552557/pdf/main.pdf> [26 October 2021].
- Ngoya, P. S., Muhogora, W.E. & Pitcher, R.D. 2016. *Defining the diagnostic divide: an analysis of registered radiological equipment resources in a low-income African country*.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5325496/pdf/PAMJ-25-99.pdf>. [04 April 2021]
- Nielsen, A.H., Balle, A.M., Petersen, S.S. & Aarhus, R. 2013. Radiology departments as partners in bridging the knowing doing gap: How can leadership encourage radiologists, secretaries, radiographers, clinicians, and nurses to develop innovative patient pathways? *Health Management*, 13(3): 50-51. <https://pure.au.dk/portal/en/persons/rikke-aarhus/publications/radiology-departments-as-partners-in-bridging> [21 September 2021].
- Niemi, A. & Paasivaara, L. 2007. *Meaning contents of radiographers' professional identity as illustrated in a professional journal – A discourse analytical approach*.  
<https://www.sciencedirect.com/science/article/abs/pii/S1078817406000423> [12 October 2021].
- Nowell, L. S., Norris, M.J., White, E. D. & Moules N.J. 2017. Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, 16: 1–13. Sage.  
<https://journals.sagepub.com/doi/pdf/10.1177/1609406917733847> [28 October 2019].
- Ogenyi, P.A., Luntsi, G. & Maikudi D. 2015. Assessment of Job Satisfaction among Academic and Clinical Radiographers in Public Institutions in Northern Nigeria. *Global Journal of Medical Research: D Radiology, Diagnostic Imaging and Instrumentation*, 15(2)1.  
[https://www.researchgate.net/publication/324605811\\_Assessment\\_of\\_Job\\_Satisfaction\\_among\\_Academic\\_and\\_Clinical\\_Radiographers\\_in\\_Public\\_Institutions\\_in\\_Northern\\_Nigeria](https://www.researchgate.net/publication/324605811_Assessment_of_Job_Satisfaction_among_Academic_and_Clinical_Radiographers_in_Public_Institutions_in_Northern_Nigeria) [30 May 2021].
- Okaro, A.O., Ohagwu, C.C. & Njoku J. 2010. Evaluation of Patient Care in Radio-Diagnostic Departments in Enugu, Nigeria. *European Journal of Scientific Research*, 41(2): 309-313.  
[https://www.researchgate.net/profile/Christopher-Ohagwu-2/publication/266617170\\_Evaluation\\_of\\_patient\\_care\\_in\\_radio-diagnostic\\_departments\\_in\\_Enugu\\_Nigeria/links/543cf5410cf24ef33b76557c/Evaluation-of-patient-care-in-radio-diagnostic-departments-in-Enugu-Nigeria.pdf](https://www.researchgate.net/profile/Christopher-Ohagwu-2/publication/266617170_Evaluation_of_patient_care_in_radio-diagnostic_departments_in_Enugu_Nigeria/links/543cf5410cf24ef33b76557c/Evaluation-of-patient-care-in-radio-diagnostic-departments-in-Enugu-Nigeria.pdf) [09 March 2021].
- Okeji, M.C., Onwuzu, S.W., Eze, J.C. & Ayogu, E. 2012. An Assessment of Equipment procurement and management policies in Radiology Centres in Nigeria. *Journal of Association of Radiographers of Nigeria*, 26: 28–34.  
[https://www.researchgate.net/publication/265642331\\_An\\_Assessment\\_of\\_Equipment\\_procurement\\_and\\_management\\_policies\\_in\\_Radiology\\_Centers\\_in\\_Nigeria](https://www.researchgate.net/publication/265642331_An_Assessment_of_Equipment_procurement_and_management_policies_in_Radiology_Centers_in_Nigeria) [22 July 2021].
- Oxford Advanced Learners Dictionary*. 2015. 9<sup>th</sup> ed. Oxford University Press.

- Pålsson, Y. , Mårtensson, G. , Swenne C.L., Mogensen,E. & Engstrom M. 2020. First-year nursing students' collaboration using peer learning during clinical practice education: An observational study. *Nurse Education in Practice*, 50(2021): 102946. Elsevier Ltd <https://doi.org/10.1016/j.nepr.2020.102946> [17 October 2021].
- Patel, V., Sindhwani, G., Gupta, M., Arora, S., Mishra, A., Bhatt, J., Arora, M., & Gehani, A. 2017. A Comprehensive Approach towards Quality and Safety in Diagnostic Imaging Services: Our Experience at a Rural Tertiary Health Care Center. *Journal of Clinical and Diagnostic Research*, 11(8):10-16. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5620879/pdf/jcdr-11-TC10.pdf> [06 June 2021].
- Pathak, V., Jena, B. & Kalra, S. 2013. Qualitative research. *Perspectives in Clinical Research*, 4(3): 192. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3757586/> [19 October 2019].
- Perez, M. 2015. *Referral criteria and clinical decision support: radiological protection aspects for justification*. ICRP 2015 Proceedings. Sage. <https://journals.sagepub.com/doi/pdf/10.1177/0146645314551673> [03 May 2021].
- Ploussi, A., & Efsthathopoulos, E.P. 2016. "Importance of establishing radiation protection culture in Radiology Department." *World journal of radiology* 8, (2): 142-7. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4770176/> [31 October 2021].
- Prentakis, A. G., Stefanoyiannis, A. P., Georgiadis, K., Coleman, L., Foley, S. J., Herlig, D., Kollas, P., Kowalik, A., Tomczak, J. & Chatziioannou, S. N. 2016. Education, training, and professional issues of radiographers in six European countries: a comparative review. *Journal of European CME*, 5(1)L 31092. <https://doi.org/10.3402/jecme.v5.31092> [16 August 2021].
- Price, R.C, & Paterson, A.M. 2020. The Society of Radiographers 1920 to 2020. *Radiography* 26 185-188. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7333984/pdf/main.pdf> [19 July 2021].
- Rajanikanth, R. V. 2014. Audit of radiology request forms –“Are they adequately filled?” *Journal of Medical Science and Respiration*, 2(1):41-44. <http://dx.doi.org/10.17727/JMSR.2014/2-008> [05 May 2021].
- Rego, A., Araújo, B. & Serrão, D. 2015. The mission, vision and values in hospital management. *Journal of Hospital Administration*, 2016, 5(1). <http://www.sciedupress.com/jha/8006-27599-3-PB.pdf> [06 June 2021].
- Rendle, K.A., Abramson, C.M, Garrett, S.B., Halley, M.C. & Dohan, D. 2019. Beyond exploratory: a tailored framework for designing and assessing qualitative health research. *BMJ Open*, 9(8):e030123.

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6720470/pdf/bmjopen-2019-030123.pdf> [02 August 2021].
- Rosen M.A., DiazGranados D., Dietz A.S., Benishek L.E., Thompson D. , Pronovost P.J. & Weaver S.J. 2018. *Teamwork in Healthcare: Key Discoveries Enabling Safer, High-Quality Care*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6361117/pdf/nihms-990788.pdf> [26 October 2021].
- Rosenfeld R.M. & Shiffman R.N. 2009. Clinical practice guideline development manual: A quality-driven approach for translating evidence into action. *Otolaryngol Head Neck Surg.*, 140(61): 1–43. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2851142/pdf/nihms180759.pdf> [05 February 2022].
- Ross, T. 2012. *A survival guide for health research methods*. Open University Press. [https://books.google.com/books/about/A\\_Survival\\_Guide\\_For\\_Health\\_Research\\_Met.html?id=5xo3RhjWxvcC](https://books.google.com/books/about/A_Survival_Guide_For_Health_Research_Met.html?id=5xo3RhjWxvcC) [17 June 2020].
- Sajdak, R., Trembath L.A., & Thomas K.S. 2013. The Importance of Standard Operating Procedures in Clinical Trials. *Journal of Nuclear Medicine Technology*, 41:231–233. [https://s3.amazonaws.com/rdcms-snm/production/public/FileDownloads/CTN/SoP%20Article\(Sajdak\)\\_JNMT%20Sept%202013.pdf](https://s3.amazonaws.com/rdcms-snm/production/public/FileDownloads/CTN/SoP%20Article(Sajdak)_JNMT%20Sept%202013.pdf) [09 September 2021].
- Sanjari, M., Bahramnezhad, F., Khoshnavay, F. F., Shoghi, M. & Cheraghi, M. A. 2014. Ethical challenges of researchers in qualitative studies: the necessity to develop a specific guideline. *Journal of Medical Ethics and History of Medicine*, 7:14. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4263394/> [08 November 2019].
- Saukko, E., Andersson, B.T., Bolejko, A., Debess, J., Fridell, K., Henner, A. Mussmann, B.R. & Sanderud, A. 2021. *Radiographers' involvement in research activities and opinions on radiography research: A Nordic survey*. <https://www.sciencedirect.com/science/article/pii/S1078817421000109> [03 August 2021].
- Scharp, K.M. & Sanders, M.L. 2018. What is a theme? Teaching thematic analysis in qualitative communication research methods. *Communication Teacher*. <https://www.tandfonline.com/doi/full/10.1080/17404622.2018.1536794> [24 July 2020].
- Shenton, A. 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22: 63–75. <https://pdfs.semanticscholar.org/cbe6/70d35e449ceed731466c316cd273032b28ca.pdf> [23 October 2019]

- Sibanda, L. Engel-Hils, P. & Hering, E. 2017. *Radiology demand and capacity: A stochastic analysis based on care pathways*.  
<https://www.tandfonline.com/doi/full/10.1080/23311975.2017.1334994> [18 March 2021].
- Sfantou, D. F., Laliotis, A., Patelarou, A. E., Sifaki-Pistolla, D., Matalliotakis, M. & Patelarou, E. 2017. Importance of Leadership Style towards Quality-of-Care Measures in Healthcare Settings: A Systematic Review. *Healthcare (Basel, Switzerland)*, 5(4): 73.  
<https://doi.org/10.3390/healthcare5040073> [21 September 2021].
- Smith, M.K., Wood, W.B., Krauter, K. & Knight, J.K. 2010. Combining Peer Discussion with Instructor Explanation Increases Student Learning from In-Class Concept Questions. *CBE—Life Sciences Education*, 10: 55–63. <https://www.lifescied.org/doi/pdf/10.1187/cbe.10-08-0101> [18 October 2021].
- Society of Radiographers. 2019. *What is radiography? Who are radiographers?*  
<https://www.sor.org/about-radiography> [10 October 2019].
- Sodhi, K.S., Krishnaa, S., Saxenaa, A.K., Sinhaa, A., Khandelwal, N. & Lee E.Y. 2015. Clinical application of ‘Justification’ and ‘Optimization’ principle of ALARA in pediatric CT imaging: How many children can be protected from unnecessary radiation?  
<https://doi.org/10.1016/j.ejrad.2015.05.03> [05 December 2021].
- Stanford Encyclopaedia of Philosophy*. 2016. Phenomenology.  
<https://plato.stanford.edu/entries/phenomenology/> [29 July 2019].
- Stogiannos, N., Fotopoulos, D., Woznita, N. & Malamateniou, C. 2020. COVID-19 in the radiology department: What radiographers need to know? *Radiography*, 26: 254-263.  
<https://www.radiographyonline.com/action/showPdf?pii=S1078-8174%2820%2930084-5> [19 July 2021].
- Sutton, J. & Austin, Z. 2015. *Qualitative Research: Data Collection, Analysis, and Management*.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4485510/pdf/cjhp-68-226.pdf> [03 November 2019].
- Tabatabaei, M. S., Langarizadeh, M., & Tavakol, K. 2017. An Evaluation Protocol for Picture Archiving and Communication System: A Systematic Review. *Acta informatica medica: AIM: Journal of the Society for Medical Informatics of Bosnia & Herzegovina: casopis Drustva za medicinsku informatiku BiH*, 25(4): 250–253.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5723173/pdf/AIM-25-250.pdf> [29 July 2021].
- Tay, Y.X., Kothan, S., Kada, S., Cai, S. & Lai, C.W.K. 2021. Challenges and optimization strategies in medical imaging service delivery during COVID-19. *World Journal of Radiologist*, 13(5): 102-121. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8188837/pdf/WJR-13-102.pdf> [19 July 2021].



- Thambura, M.J. & Amusa, L. 2016. Factors impacting on radiographer's emigration and career exiting in KwaZulu-Natal, South Africa. *African Journal for Physical Activity and Health Sciences*, 22(1): 98-107. [https://www.ajpahs/Thambura\\_Factors\\_2016.pdf](https://www.ajpahs/Thambura_Factors_2016.pdf) [07 June 2021].
- Thingnes, E. R. & Lewis S.J. 2011. Radiographers' experiences on learning arenas, learning needs and lifelong learning in the radiography profession. *Journal of Medical Radiation Sciences*, 58(1). [https://www.researchgate.net/publication/263158338\\_Radiographers'\\_experiences\\_on\\_learning\\_arenas\\_learning\\_needs\\_and\\_lifelong\\_learning\\_in\\_the\\_radiography\\_profession/citations](https://www.researchgate.net/publication/263158338_Radiographers'_experiences_on_learning_arenas_learning_needs_and_lifelong_learning_in_the_radiography_profession/citations) [03 May 2021].
- Thompson, A. M. & Henwood, S. M. 2016. From the clinical to the managerial domain: the lived experience of role transition from radiographer to radiology manager in South-East Queensland. *Journal of Medical Radiation Sciences*, 63(2): 89–95. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4914818/pdf/JMRS-63-089.pdf> [20 October 2019].
- Tijdens K., de Vries D.H. & Steinmetz S. 2013. Health workforce remuneration: comparing wage levels, ranking, and dispersion of 16 occupational groups in 20 countries. *Human Resources for Health*, 11(11). <https://www.human-resources-health.com/content/11/1/11> [20 August 2021].
- Tufford, L. & Newman, P. 2012. Bracketing in Qualitative Research. *Sage Journals*, 11(1): 80-96. <https://doi.org/10.1177/1473325010368316> [11 January 2020].
- UCL. 2011. *Duties of the Radiation Protection Officer*. LR9 <https://www.ucl.ac.uk/safety-services/sites/safety-services/files/LR9.pdf> [02 November 2021].
- Ugwu, A.C., Erondy, O.F., & Umeano, U.B. 2011. Psychosocial stress and its predictors among radiographers in south-eastern Nigeria. *The South African Radiographer*, 49(2):11-15. <https://sar.org.za/index.php/sar/article/view/188/153> [14 August 2021].
- United Arab Emirates. *Federal Authority for Nuclear Regulation. Radiation Protection Officer (RPO)*. [https://www.fanr.gov.ae/ar/Documents/Radiation%20Protection%20Officer%20\(RPO\).pdf](https://www.fanr.gov.ae/ar/Documents/Radiation%20Protection%20Officer%20(RPO).pdf) [26 September 2021].
- Vanckaviciene, A., Starkiene, L. & Macijauskiene J. 2014. *Supply and demand for radiographers in Lithuania: A prognosis for 2012–2030*. <https://doi.org/10.1016/j.ejrad.2014.04.009> [06 June 2021].
- van de Venter R. & Friedrich-Nel H. 2021. An opinion on role extension, and advanced practice, in the South African radiography context. Where are we heading and what should we aspire to? *The South African Radiographer*, 59(1). <https://sar.org.za/index.php/sar/article/view/639> [06 June 2021].

- van Manen M. 2017. But Is It Phenomenology? *Qualitative Health Research*, 27(6): 775–779. Sage. <https://journals.sagepub.com/home/qhr10.1177/1049732317699570> [27 October 2019].
- Van Zoonen, C. & Hoeven. 2021. Disruptions and General Distress for Essential and Nonessential Employees During the COVID-19 Pandemic. *Journal of Business and Psychology*. <https://doi.org/10.1007/s10869-021-09744-5> [26 October 2021].
- van Zyl , B.C., Barnard, M.M., Cloete, K., Fernandez, A., Mukosi, M. & Pitcher, R.D. 2021. Towards equity: a retrospective analysis of public sector radiological resources and utilization patterns in the metropolitan and rural areas of the Western Cape Province of South Africa in 2017. *BMC Health Services Research*, 21:991. <https://doi.org/10.1186/s12913-021-06997-x> [20 November 2021].
- Vaismoradi, M., Jones J., Turunen, H. & Snelgrove, S. 2016. Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice*, 6(5). <https://www.sciedupress.com/journal/index.php/jnep/article/view/8391/5271> [08 August 2021].
- Vom, J. & Williams, I. 2017. Justification of radiographic examinations: What are the key issues? *Journal of medical radiation sciences*, 64(3): 212–219. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5587654/> [25 May 2021].
- Vujicic M. 2009. *How you pay health workers matters: A Primer on Health Worker Remuneration Methods*. The World Bank. [www.rbfhealth.org](http://www.rbfhealth.org) [06 April 2021].
- Wareing, A., Buissink, C., Harper, D., Olesen, M.G., Soto, M., Braico, S., Laer, P., Gremion, I. & Rainford, L. 2017. *Continuing professional development (CPD) in radiography: A collaborative European meta-ethnography literature review*. <https://www.researchgate.net/publication/317642708> Continuing professional development CPD in radiography A collaborative European meta-ethnography literature review [03 May 2021].
- Wertz, F., Charmz, K., Josselson, R. & McSpadden, E. 2011. *Five Ways of Doing Qualitative Analysis: Phenomenological Psychology, Grounded Theory, Discourse Analysis, Narrative Research, and Intuitive Inquiry*. <https://www.researchgate.net/publication/281562724> Five Ways of Doing Qualitative Analysis Phenomenological Psychology Grounded Theory Discourse Analysis Narrative Research and Intuitive Inquiry [17 June 2020].

- Williamson, K. & Mundy, L.A. 2010. Graduate radiographers' expectations for role development – The potential impact of misalignment of expectation and valence on staff retention and service provision. *Radiography*, 16(1):40-47.  
[https://www.researchgate.net/publication/223223204\\_Graduate\\_radiographers'\\_expectations\\_for\\_role\\_development\\_The\\_potential\\_impact\\_of\\_misalignment\\_of\\_expectation\\_and\\_valence\\_on\\_staff\\_retention\\_and\\_service\\_provision](https://www.researchgate.net/publication/223223204_Graduate_radiographers'_expectations_for_role_development_The_potential_impact_of_misalignment_of_expectation_and_valence_on_staff_retention_and_service_provision) [27 October 2021].
- World Health Organization. 2011. *Baseline country survey on medical devices 2010*.  
[https://apps.who.int/iris/bitstream/handle/10665/95785/WHO\\_HSS\\_EHT\\_DIM\\_11.01\\_eng.pdf?sequence=1&isAllowed=y](https://apps.who.int/iris/bitstream/handle/10665/95785/WHO_HSS_EHT_DIM_11.01_eng.pdf?sequence=1&isAllowed=y) [28 July 2021].
- World Health Organization. 2016. *Global strategy on human resources for health: workforce 2030*. WHO Document Production Services, Geneva, Switzerland. <http://www.who.int> [06 April 2021].
- Wuni, A.R., Courtier, N. & Kelly, D. 2020. Developing a policy framework to support role extension in diagnostic radiography in Ghana. *Journal of Medical Imaging and Radiation Sciences*, 52(1): 112-120. [https://www.jmirs.org/article/S1939-8654\(20\)30308-8/fulltext](https://www.jmirs.org/article/S1939-8654(20)30308-8/fulltext) [09 May 2021].
- Xu W. & Zammit K. 2020. Applying Thematic Analysis to Education: A Hybrid Approach to Interpreting Data in Practitioner Research. *International Journal of Qualitative Methods* (19):1-9. Sage. <https://journals.sagepub.com/doi/abs/10.1177/1609406920918810> [08 August 2021].
- Yielder, J. 2014. Creating our future: conformity or change? *Journal of Medical Radiation Sciences*, 61: 61–63. <https://www.jmrs0061-0063.pdf> [01 October 2021].
- Zain, N.M., Abu Bakar, N.H. & Amin, N. F. 2016. Perception of radiographers on performing intravenous contrast media administration. *International Journal of Multidisciplinary Education and Research*, 1(9): 32-36. [www.educationjournal.in/1-10-12-969.pdf](http://www.educationjournal.in/1-10-12-969.pdf) [16 May 2021].
- Zhang, J., Litvinova, M., Liang, Y., Wang, Y., Wang, W., Zhao, S. Wu, Q., Merler, S., Viboud, C., Vespignani, A., Ajelli, M., & Yu, H. 2020. Changes in contact patterns shape the dynamics of the COVID-19 outbreak in China. *Science*, 368: 1481-1486.  
<https://www.science.org/doi/epdf/10.1126/science.abb8001> [19 July 2021].
- Zu, Z.Y., Jiang, M.D., Xu, P.P., Chen, W., Ni, Q.Q., Lu, G.M. & Zhang, L.J. 2020, Aug. Coronavirus Disease 2019 (COVID-19): A Perspective from China. *Radiology*, 296(2): E15-E25. *Epub 2020 Feb 21*. <https://doi.org/10.1148/radiol.2020200490> [19 July 2021].

## Appendix A: Information letter



Cape Peninsula  
University of Technology

Dear \_\_\_\_\_

You are being invited to participate in a research study on **Lived experiences of Diagnostic Radiographers working in the public health sector in the country of Eswatini**. In particular, we are interested in exploring and describe the lived experiences of radiographers working in the public health sector in Eswatini and develop practical guidelines to support diagnostic radiographers in the public health sector in Eswatini.

This research will require about 30 minutes to 1 hour of your time. During this time, you will be interviewed about your experiences working in the public health sector in Eswatini. The interviews will be conducted in a neutral venue other than your work place or wherever you prefer, and will be audio-recorded and notes taken.

There are no anticipated risks or discomforts related to this research. As part of this study, you will be placed in a group of 3-5 individuals. A moderator will ask you several questions while facilitating the discussion. Examples of questions that will be asked include questions like;

- What do you think about the radiography profession in Eswatini?
- Think back over all the years that you've practised radiography and tell us your most memorable scenario.
- Think back over the past year of the things that the ministry of health did. What went particularly well?
- What needs improvement?
- If you were to invite your siblings to choose the radiography profession, what would you say in the invitation?
- Suppose that you were in charge and could make one change that would make the profession better. What would you do?
- What can each one of us do to make the profession better?



The results from this study will be presented in writing as a thesis for fulfilment of a Master of Science Degree in Radiography and will be thematically analysed to assist in the development of guidelines to assist diagnostic radiographers in Eswatini.

If you require any information about this study, or would like to speak to the researcher, please call Mrs Thobile Lungile Seyama Ginindza at 00268 76119999/ 7911 9999 or Email: [seyamatls@gmail.com](mailto:seyamatls@gmail.com).

You may also contact my research supervisors:

Dr Kathleen Naidoo at the Cape Peninsula University of Technology

Tel: 021 959 6848/ 5591

Email: [NAIDOOKA@cput.ac.za](mailto:NAIDOOKA@cput.ac.za)

Mrs Yanda Peter

Tel: 021 959 6538 / 4303

Email: [PETERY@cput.ac.za](mailto:PETERY@cput.ac.za)

## APPENDIX B: Consent for participation



### **“Lived experiences of diagnostic radiographers working in the public health sector in the country of Eswatini”.**

Permission to conduct this study was granted by: Faculty of Health and Wellness Sciences Research Ethics Committee (HWS-REC); duly registered with the National Health Research Ethics Council (NHREC): REC-230408- 014. For Health and Wellness Sciences Ethics enquiries e-mail [Navindran@cput.ac.za](mailto:Navindran@cput.ac.za)

I \_\_\_\_\_ give Ms Thobile L. Seyama permission to use the material which has been generated during the course of my participation in the project and the data that was collected through, my participation in focus group discussion.

I understand that those involved in planning and implementing this joint module are intending to share the work generated in the module in the form of publications and conference presentations.

I also understand that:

- ✚ Whether or not to give this permission is a personal decision, and it is entirely voluntary.
- ✚ There will be no rewards for giving this permission, as there will of course be no penalty for refusing it.
- ✚ I have the right to withdraw my permission at a later stage – so long as it is prior to any publication which the researchers produce – and the researcher/s then refrain from including my materials in their research.
- ✚ The researchers would use material generated through the focus groups for purpose of this study only and not for any other purpose.
- ✚ The findings from the research are likely to be published in institutional reports, academic journals, books and book chapters and presented at academic conferences.
- ✚ My own identity or that of any other person included in my materials will be protected.

Signed at \_\_\_\_\_ (Place) on \_\_\_\_\_  
\_\_\_\_\_ (Date) \_\_\_\_\_ (Signature)

**Appendix C: Consent for audio recordings**



**DEPARTMENT OF MEDICAL IMAGING AND THERAPEUTIC SCIENCES**

**RESEARCH CONSENT FORM FOR INTERVIEWS TO BE AUDIO-TAPED**

*Lived experiences of Diagnostic Radiographers working in the public health sector in the country of Eswatini.*

Please initial each box below:

I hereby give consent for my interview, conducted as part of the above study, to be audio-taped.

I understand that my personal details and identifying data will be changed in order to protect my identity. The audio tapes used for recording my interview will be kept safely in a lockup cupboard at the Cape Peninsula University of Technology.

I have read this consent form and have been given the opportunity to ask questions.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name of Researcher

\_\_\_\_\_  
Signature of Researcher

\_\_\_\_\_  
Date



## Appendix D: Permission letter to use boardroom



Telegrams:

Telephone :(+268 25055838)

Fax:

P.O. Box 420

Manzini

Swaziland

### THE NATIONAL T.B. HOSPITAL

---

**To: Ms Thobile Seyama Ginindza**

**From: National T.B. Hospital Management**

#### **Request to use the National T.B. Hospital boardroom**

This letter refers to your letter dated 29 June 2020 requesting to use the hospital boardroom to conduct group discuss meetings as part of fulfillment for your Master of Science in Radiography. In your letter you have stated that you will be conducting group interviews of 4-5 participants from June 2020 to September 2020, you are therefore reminded to make sure that you follow the national regulations with regards to Covid-19 pandemic.

Permission to use the boardroom is granted. Please maintain the premises in the good condition that you have found them to be, by keeping the boardroom clean always.

Yours sincerely

**Dr A.S. Shabangu**

**Senior Medical Officer**

06 July 2020



## APPENDIX E: Ethics clearance – CPUT



**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: simonsy@cput.ac.za

30 July 2020  
*REC Approval Reference No:*  
*CPUT/HW-REC 2020/H14*

---

Faculty of Health and Wellness Sciences

Dear Ms TL Seyama,

**Re: APPLICATION TO THE HWS-REC FOR ETHICS CLEARANCE**

Approval was granted by the Health and Wellness Sciences-REC to Ms Seyama for ethical clearance. This approval is for research activities related to student research for Ms Seyama at the Cape Peninsula University of Technology, Medical Imaging and Therapeutic Sciences.

**Title** : Lived experiences of diagnostic Radiographers working in the public health sector in the country of Eswatini

**Supervisors** : Dr K Naidoo  
Mrs Y Peter

**Comment:**

**Approval will not extend beyond 31 July 2021.** 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,

A handwritten signature in black ink that reads "M. Le Roes-Hill".

*Dr Marilize Le Roes-Hill*  
**Deputy Chairperson – Research Ethics Committee**  
Faculty of Health and Wellness Sciences

## APPENDIX F: Ethics clearance – EHRRB



### RESEARCH PROTOCOL CLEARANCE CERTIFICATE

BOARD REGISTRATION NUMBER	FWA 00026661/IRB 00011253		
PROTOCOL REFERENCE NUMBER	SHR270/2020		
Type of review	Expedited	<input checked="" type="checkbox"/>	Full Board
Name of Organization	Master' student		
Title of study	Lived experiences of diagnostic radiographers working in the public health sector of Eswatini		
Protocol version	1.0		
Nature of protocol	New	<input checked="" type="checkbox"/>	Amendment
			Renewal
			Extension
List of study sites	National T.B. Hospital		
Name of Principal Investigator	Mrs. Seyama, Thobile Lungile		
Names of Co- Investigators	N/A		
Names of steering committee members in the case of clinical trials	N/A		
Names of Data and Safety Committee members in the case of clinical trials	N/A		
Level of risk (Tick appropriate box)	Minimal		More than minimal
		<input checked="" type="checkbox"/>	High
Clearance status (Tick appropriate box)	Approved	<input checked="" type="checkbox"/>	Disapproved
Study approval validity period	Start date	02/10/2020	End date
			02/10/2021
Secondary approval validity end dates	Renewal end date		Extension end date
Signature of Chairperson			
Signing date	02/10/2020		
Secretariat Contact Details	Name of contact officers	Dabazile Shongwe	
	Email address	eth.casw@eswatini.gov.sz	
	Telephone no.	(00268) 2463 4819	



**APPENDIX G: Permission letter to use boardroom**



To: The Administrator  
Eswatini Health Laboratory Services

**Request to use the laboratory boardroom**

I am Ms Thobile L. Seyama, a Radiographer at the National T.B. Hospital in the Radiology department. I would like to request for permission to use your boardroom to conduct a group interview for research purposes on the 7<sup>th</sup> August 2020 starting from 1430hrs to 1530hrs. I am expecting the meeting to last for 30 minutes to an hour with a maximum of five participants. This is part of my fulfilment for a Master of Science in Radiography with the Cape Peninsula University of Technology starting.

I pledge to release the premises in the same condition that it was handed over to me.

Sincerely,

Thobile L. Seyama – Ginindza

Student no: 220520364

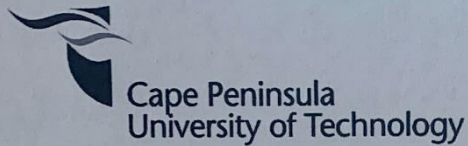
T. Seyama.....



*Permission granted  
1/3/2020*

## APPENDIX H: Confidentiality agreement from data transcriber

### Appendix V: Consent for audio recordings and transcriptions- Transcriber



#### CONFIDENTIALITY AGREEMENT – TRANSCRIBER

I, JM Marinelli hereby declare that I understand and agree to the following conditions with regards to the transcription of the audio recordings.

1. I understand that the audio recordings are received for the purpose of transcribing records of interviews held with the participants in a research study.
2. I undertake to treat all audio recordings received as confidential content to which only I will have access. I will keep the audio recordings and any copied material securely in a locked folder.
3. I will return all copies back to the researcher on completion of the transcription.

NAME: JM Marinelli

SIGNATURE: [Handwritten Signature]

DATE: 24/08/2020

## APPENDIX I: Examples of transcribed focus group interviews

<b>NAME OF AUDIO</b>	:	<b>Group 2 Interview</b>	
<b>DATE OF AUDIO</b>	:	<b>18 AUGUST 2020</b>	
<b>LENGTH OF AUDIO</b>	:	<b>34:34</b>	
<b>TRANSCRIBER- NAME</b>	:	<b>CYBER TRANSCRIPTION</b>	
<b>TRANSCRIPTION LEGEND</b>	:	<b>RESEARCHER</b>	<b>R</b>
	:	<b>INTERVIEWEE</b>	<b>I-15</b>

---

- R Okay, afternoon colleagues. I am Thobile Seyama. I am doing research as a fulfilment for my master's program with the Cape Peninsula University of Technology. We are doing a study; the study is about your experiences as diagnostic radiographers working in the public health sector in the country of Eswatini. So, may we start? Can we please start with the ground rules in terms, because we are doing audio recordings so may I kindly request you to put your phones on silence so that she can record everything clearly. May I ask that we introduce ourselves so that we can continue? There is, the topic is in front of you printed in bold as a guide, so that in case you want to refer, the study has been approved by the University Ethics Committee, which is the Faculty of Health Research Ethics Committee. It has been also approved by the National Health Research Board of Eswatini that I can continue with the study. I need to get an ethics certificate which I have passed around. I think you've all seen. Also, may I first verify that we have all signed the consent forms?
- I Yes.
- R Okay I think we can go ahead. Can I start with you...,to introduce yourself?
- I1 My name is..... , I am Radiographer at Mkhuzweni Health Centre in the Hhohho region.
- I2 Morning everyone, my name is....., Radiographer Mbabane Government Hospital.
- R I want for the audio, otherwise it is fine. You can even speak when it is far. It's on don't worry. You can talk. I am just passing it around for you. Its fine you can place it anywhere.
- I3 Morning everyone, I am..... Radiographer at Piggs Peak Hospital.
- I4 Afternoon. My name is..... I am a Radiographer at TB Centre.
- I5 Good afternoon my name is..... I am a Diagnostic Radiographer to at Lubombo referral hospital.
- R Thank you very much colleagues. We can continue now. Anyone with a question or anyone who needs clarity? Oh, we are all fine? Hopefully you have read my information letters have sent to you some information and that information letter with regards to the study. If you have questions, you can refer your questions to the chairperson of the research committee who is Dr..... So, you can submit your comments there. If you feel like there's something that you need clarity, feel free. Now you are speaking to Thobile Seyama as an individual or a colleague. So, you say whatever you feel like you have experienced. So please do not hold your experiences. This will assist us in developing guidelines that will assist in the development of the cadre. So whatever information that you say is, will be helpful for us. There is no wrong or right answer like it said. So, whatever you say, will be thematically analysed into themes. Then those themes will guide us in developing the guidelines to assist develop. I think we all wish

to see the Imaging cadre develop in the country. So, like I said, there is no wrong or right answer. We can start. Who wants to go first? Anyone can go first. Okay. Mr...?

### Example from group 1 Interview

It appears broad because we want to hear your stories – everything that you want to say. That is why it appears broad.

I1 I think I can start.

R Yes.

I1 As from my experience from working as a radiographer, ...

R Sorry to disturb you – can we, can I please request that we put our phones on silent so that we are able to capture everything that we need. I'm taking a signal. T.....you are welcome. Unfortunately you came after the introductions, but you are always a part of the team. I think ... do you need any clarity with regards to this?

I Yes.

R Okay. Like you are seeing, the question – first we started by signing the consent forms and you remember I requested that you participate here as Thobile and also me, looking at me as Thobile as I'm an individual, not in terms of a work relation no. So we are here to discuss or voice our stories with regards to the question in front of you. The experiences that we've had from working as a diagnostic radiographer for the government.

These experiences will assist us in developing guidelines for establishing the radiography cadre in the country. Mainly these are the outcomes that we're expecting from this research. It's taking this stories, putting them together, thematically analyse them and see if we can come up with any theories from this to develop guidelines for the cadre.

Okay thank you.

I1 Yes, during my experience as a radiographer in the kingdom of Eswatini public services. First of all, working as radiographer you work long hours and the remuneration is very low. And also, the, in the working for the public sector in the kingdom of Eswatini we lack a structure, a career advantage, what is it called – a structure for development. As for myself, I've worked for more than 10 years and I have already reached the ceiling. I'm a senior radiographer so, I would like ... [speaking own language inaudible 09.13.1] career progression. Can I end there?

R As a follow up question to that?

I1 Yes.

R From what you have said, what do you think that could help us with regards to that ..... it?

- I1 Yes. Thank you very much. Well, if I understand the question very well, it says what is, what are my experiences working in the diagnostic department in the Eswatini Government? Well, what I can say is that since I arrived as a Radiographer, one of the key things that I've noted was that we had no structure. In the cadre as Radiographers, we had no structure, there was no sense of progression, in terms of when you come into the cadre, where you're going to be after 10 years or you wish to be after 30 years. You're in the same position you're in. It might be the same position you will leave when you retire, so that was not encouraging for any development or further studying in our cadre. And also, what I noted was that we have a lot of out of stock issues that we're dealing with in the Department. You find that the shortages of film, shortage of materials that we are using protective wear is not up to date. And there's not much regulation regarding radiation in the country regarding the usage of radiation in the country, and we are generally lacking guidance and laws to actually structure, our practice as Radiographers. Not want to exhaust every point, I think I would leave it at that point for my other colleagues. Thank you.
- R Okay Mr...thank you very much for what you've said. In summary you are saying the profession is lacking, your last point, you talked about no laws to guide so meaning the profession does not have guidelines or documents, the guidelines in the profession.
- I1 Yes, I mean what I mean about that is that you find that there's no stipulated rule on the usage of radiation. You find that the people in Swaziland are misusing. You find doctors sometimes ordering X-rays so frequently that it's surprising, where else when you are the Radiographer telling the doctor that there's no need to take another X-ray, the doctor will emphasize that I am the doctor I am the clinician. But if there was a guideline or a law stating that such usage of radiation should be inhibited it would be better.
- R Thank you very much. Anyone else
- I2 As a Radiographer I would like to highlight that in my experiences and the observations as follows. I believe that in the country, radiation is still a work in progress in terms of professionalism in the technical know-how, then a we do to substantiate that I can say that we do basic diagnostic, that is to say that we are limited on to conventional radiology in most of the facilities and most radiology departments are not constructed according to WHO, or International Atomic Energy Agency Guidelines, which compromise the safety of the occupational staff as well as the non-occupational staff. Diagnosis is not complete due to a lack of equipment and specialists. Then maybe proper radiation guidelines are not followed due to a lot of factors and also there is no reporting structure. In most of the facilities you find that the Radiographers are reporting to senior medical officers, which is not a precedence that is supposed to be followed as per the detects of the cadre. Then we also have a leadership crisis which is being because we don't have a structure. Yes, and then what, another thing that I can say which I think is of paramount importance is that we don't, we have got, the public is still unaware about both the stochastic and the non-stochastic effects of radiation.
- R Thank you. Anyone else wants to say something?
- I3 My experience as a Radiographer in Eswatini. It has been that for I think for the past year or so. There has been no radiation monitoring tool. As we all know that you cannot practice without a dosimeter, as we all need a dosimeter to monitor the radiation dose that we accumulated while we are working in the radiation field. There's also another thing, was no quality certificate. We're not quite sure in the rooms that we are working in, in the radiology departments that radiation is not leaking because there are no tools. Think of maybe a hospital that was built in 1912 that is still working today. So there's no certificate whereby they will do maybe yearly or two or three years to give us a quality certificate that proves that the rooms that we are working in are safe, they do



not leak radiation. Also, another thing we have got Medical and Dental Council in Eswatini that registers the Radiographers. Their role, I personally believe should be to monitor, evaluate and help guide Radiographers and those that are practicing under radiology unfortunately once you register or once you do not register, there is no tool that they have to collect that data, whether you're practicing with or without a certificate. You can firstly register then do not subscribe for a year or so there will be no tool that they will use to follow whether you have paid their subscription fee. And also, once you've subscribed, then there should be services that goes with that subscription fee. You shouldn't subscribe then, then there are no services that are being rendered by the Medical and Dental Council.

R Thank you. Mr..., you are talking about the Council?

I3 Yes.

R You are not talking about the council in terms of data when it comes to Radiographers, in terms of the services, is there anything more that you can say?

I3 In my years of practice, I have practiced for a year and a few months, I have registered with the Dental Council, there hasn't been anything in terms of a follow up, a tool that they have to follow whether am I doing the right thing or not. Am I protected where I am working or not? What they were just concerned about, they registered me and they gave me a certificate. Thereafter it was done.

R Meaning the Council does pay attention to what is happening to Radiographer's?

I3 Yes.

R Anyone else?

### **Example of transcript from group 3**

R Okay. Thank you very much. Anyone else?

I2 Good afternoon. I am .....a radiographer at Mankayane hospital, my experience of working in Swaziland, I've been practicing here for almost 20 years now. I started in 2002. Okay, when I started, I got good induction process. It was, the induction process was good. I was introduced may because as a student I used to practice here sometimes. So, radiographers were welcoming, those I practiced under. The staff was welcoming, they told me what I needed to know as a radiographer. That is the good experience I have of working in the, under the Government of Eswatini radiography sector. There are so many challenges in the department. The first challenge is the radiation protection control. That one is a major issue because we don't have dosimeters at all, most of the time we don't use them. So, we don't know how to monitor, we don't know how radiation is monitored because there is nothing to check whether we are being exposed or not. That is a major challenge that we are having in the country. Then another thing is the issue of limited resources in the practice. I will concur with the previous speaker. We don't practice, we don't...

R Your scope is limited.

I2 Yes our scope is limited. Thank you. Our scope is limited, we don't do much of what we are being taught at school because the scope is limited.

R Can you elaborate on that?

I2 We don't have resources. Our hospitals don't have CT scans, our hospitals don't have fluoroscopy. We use conventional radiography for fluoroscopy. So that's limitations we have in the country. The only ...[intervened]

R Anything else? In terms of the limited scope?

- I2 Okay in terms of ...[intervened]
- R That you can think of? Maybe later you can tell me.
- I2 Yes, another thing it limited practices because we have diagnostic radiography and ultrasound only. We don't practice all the other disciplines around radiography. So that is also limitations because even if you want to study, you won't be able to come back and work here. If you want to study further, maybe you're interested in nuclear medicine for example or you are interested in radiotherapy. You wouldn't be able to come and work in Eswatini, it means you will be limited of what you know. And the issue of radiation protection measures. Then another thing...[intervened] [participant used mother language in a low tone]
- R What is it?
- I2 The remunerations. It's very very poor.
- R Okay anything more? That you would like to add? Anyone else?
- I3 Hi am.....working in the rural area Dvokolwako Health Centre. I have different experiences on working with the Government, with our Government of Eswatini. I started working way back 20 years ago in a referral hospital. What I have experienced about working in our public sector is that you interact with people, different people, you find that where you are you services a large population and sometimes because of the workload and the shortage of staff, sometimes develop occupational stress and burnout because of the workload. There is a shortage of radiographers in the country, so it hasn't been good, working in public, especially in those rural areas. [Sighing] You find that the working environment is not good and government takes a long time to check how the radiographers are working in those different clinics or hospitals. Like where I am working now at Dvokolwako health centre, it's a clinic, but it is servicing a large population area. You find that there is a lot of clients coming there. You end up knocking late and this is because, this produces occupational stress and burnout. You end up developing backache, the pains, because you stand for a long time. Another thing we face with our government is the equipment problem. There are breakdowns, the Government took long to fix the equipment. There is a shortage of incentive, we work very badly sometimes. You have to go and borrow maybe the films or envelopes in running up and down the country borrowing from other facilities. That is the problem we are facing. And also, the shortage of staff. You find that in that hospital you are, you are a radiographer but you find yourself doing even the registration, the filing that causes the stress.
- R Okay thank you very much. Anything more? Who wants to add anything?

**Example from group four transcript.**

**NAME OF AUDIO** : **Group 4 Interview**  
**DATE OF AUDIO** : **17 SEPTEMBER 2020**  
**LENGTH OF AUDIO** : **50:18**  
**TRANSCRIBER- NAME** : **CYBER TRANSCRIPTION**  
**TRANSCRIPTION LEGEND** : **RESEARCHER R**  
: **INTERVIEWEE I**

---

R Good afternoon colleagues. I am Thobile Seyama, as you all know, I am a colleague doing my research on the lived experiences of radiographers in Eswatini. So I have invited you all here, so that you can assist me in fulfilling this requirement. So I propose that I will do research on finding out your views, or your perceptions, your feelings about working for Eswatini Government. Okay. May I kindly request that we all put our cell phones on silence, that since we're doing an audio recording, that we get a clear voice. Colleagues, thank you very much. And may I also verify that we have all signed the consent forms? Signed. Thank you. And nothing much colleagues. As you have seen on the information letter the study is about finding out your stories or your experiences of working for Eswatini Government. And I'll be taking notes as you're speaking. Then later those notes together with the recordings will be analysed thematically, so that we can develop, from those themes, we will try and develop guidelines for the cadre. As we all know the cadre is a little bit left behind, we don't have much in terms of a documents, guiding documents for the profession. So, this is part of the objectives of the study, which will assist all of us, there is no wrong or right answer. You say whatever, whatever you wish. And please I am here as Thobile Seyama a student who is doing a research project, not Thobile Seyama, the one you know in radiography in Swaziland. So, feel free. You say whatever, please don't hold anything. Because we need that information, which will assist us in future. Thank you very much. We may start. Who wants to go first? Who wants to say something, anything that you feel you have experienced? Or it's a story that you can tell me? If someone may ask you? How does it feel like to be a radiographer working for Eswatini Government? How will you answer that person?

I1 Okay, so my experience, I would say first of all, maybe I'm lucky enough to work in one of the regional referral hospitals. And with that being the case, quite a number of cases come our way. But then to our disadvantage, the problem that we're facing is that, you know, not everything can be done in the facility to say, and at the same time, we are limited to a certain number of, to a certain number of I say, examinations and the like. So that's sort of like a setback to one's experience. And yes, and I wouldn't say maybe one could easily grow faster with that being the setback. So yes, then yes, no one has ever been satisfied with whatever they get, at the end of 22 days from their employer, no one has ever been satisfied. And not having such guidelines, or anything guiding our profession, it is more like another disadvantage. It doesn't give us proper freedom; it doesn't give us enough flow to express ourselves in any other way. So we are, it's more like we are the ghosts that are needed by the facilities, by the health system. But at the same time being ghosts again, because yes, the reason I'm saying we are ghosts, it's more like, once we show up, they raise eyebrows and ask themselves like okay what is it that you're talking about? It's more like when talking about radiology, it's a new term to them. You see, so we have to go back to the layman's language. Refer to ourselves as x-ray people, which is another problem. So yes, it is more like a setback to our side. For now I can pause there.

- R Thank you. Thank you. If I may paraphrase from what you've said I have picked up that there are challenges for one, which with regards to the limited scope in terms of radiography practice, there are issues of remuneration. Yes, even though you didn't elaborate, but I think you were talking about that. There are no guiding documents that are leading the profession. There is no clear understanding of radiology. Can you elaborate on that? No clear understanding within the facility or is anything that you can elaborate?
- I1 Oh, okay actually, I'd say within the facility and outside of the facility at like ministerial level, because some of the, like, some of the equipment that we use, it is more like, they don't even have an idea of what those are. Not unless maybe, someone explains to them, what it is that we're talking about. When referring to the facility, we have a different number of people who are leading the facility more like the administration and the like I'd say. The reason I'm referring to that is that sometimes you may talk of a certain procedure, contrast procedure or something. But to them, it's more like you talking French, they have no idea of what it is. And yes, that's what it is like, there's no clear understanding of what's happening. The only basic thing they know about is that when going to the X-ray department, you're doing an obstetric scanning, or maybe there's a, you suffered an injury or so, so you have to go through X-ray. Those are the basics, then when it goes a bit further or deeper, then that's when they get lost. So you need to like, first explain to them what it is and how it's done.
- R Thank you very much. Anyone else?
- I2 Actually, I wanted to I agree and add on to what he was saying. When I first because had a recent, I remember the words of someone, when I was doing my practical's that you really have to fight for radiography, your department, where we have to fight to even be taken seriously. You find that you get your request form from whoever and it's like, they then you can't say but that's not best, like right now that's not the best examination that she would give, like that you can give what about this, they're not willing to, they are not open minded enough. It is just that you are taking pictures, you know, so you find that there is no clear understanding to know what exactly we are doing and we would have to fight for, and especially, well I would say in the public sector in the country, because it hasn't been, it hasn't been taken as seriously. You know, we are just, yes.
- R Thank you. Anything more?
- I2 No I was finished.
- I3 For me, I can say in Nhlngano we are being recognized, departmental and also within your facility, just because when I was hired, I was introduced to the all the departments within the hospital and also, I was taken for a workshop down there in Mbabane for further knowledge about this pandemic that we are in right now. And also, secondly, I think I have a challenge. Since I was hired there are no dosimeters here in this, I can say, in this country, there are a few hospitals whereby I can find the radiographer having a dosimeter which it is a very big challenge just because we are working here in a radiation area. So, it's a big challenge to work there without a dosimeter. So, you don't know how much dose you have received in that particular month. So, I think we have to maybe have that to...
- I2 So there is a gap in the radiation safety?
- I3 Yes. I think there is a gap there. So, we need ...[intervened]

## **APPENDIX J: Example of field notes**

### FOCUS GROUP INTERVIEW 2

#### LOGISTICS:

Initially the participants had been invited to T.B. Hospital for a debriefing session on radiography issues. The interview was conducted in the National T.B. Hospital Boardroom. Information letters were sent to participants the day before the interview. The door was closed for privacy. Consent forms were signed whilst awaiting one last participant arrival. The venue was a good venue as there was no external noise. It was a big venue for just 6 people to maintain social distancing and to pass the audio recorder around. All participant's had face masks worn. Participants were provided with snacks at the end of the interview

#### OBSERVATIONAL NOTES:

All participants appreciated the opportunity to be allowed to voice their views about the radiography profession in the public sector in Eswatini. This was established by the observer through the informal comments they passed before the interview. Even though they were tired, clearance to continue with the interview was first ascertained, of which they all responded positively. All participants were sitting attentively, demonstrating slight nervousness and became relaxed after the first participant had spoken. This group was a technical working group recently established to work with senior management at ministerial level to address some of the issues surrounding the radiography profession in the public sector.

#### PERSONAL NOTES:

At the start I was a bit relaxed, may be because it was after I had engaged in another discussion with the participants before the interview. This time around I was not paraphrasing much and remembered to pass the recorder around. This group interview was conducted before comments from the supervisor were reviewed. Some mistakes that were made in group 1 interview might still reflect in the audio recording. This will be corrected in the next group interview. The reason behind conducting this interview before the comments was that some radiographers were staying a bit far from the interview venue and they were not using their own transport on this day.

#### METHODOLOGICAL NOTES:

The interpretive inquiry technique was used for these interview. The audio recorder was passed around to allow good audio quality and this worked quite well. The research question was printed out in five copies using 48 point in order to be legible for the participants and act as reference for the discussion.

#### THEORETICAL NOTES:

Answers from the participants seem to be more inclined to the following theories. The following were more of negative views:

- No career progression including absence of a well-defined organizational structure
- Shortage of consumables due to stock outs
- Poor or no radiation safety practices including guidelines, protective wear, no radiation monitoring device, infrastructure setup and maintenance.
- The public is not literate about radiation effects resulting in radiation abuse
- No formally appointed or assigned leadership

- Poor or absent quality assurance program ( only done by individuals when there are faults)
- Demotivation due to poor remuneration
- No clearly defined scope of practice
- Absence of therapeutic radiology services
- No refresher training/no continuous professional development therefore radiographers left behind in terms of new technologies and practice
- No regulatory body to regulate practice including private practices.
- No radiologist resulting in special procedures done by radiographers and no reporting of radiographs
- No proper health professions council to pay attention to radiographers' issues, have data on practicing radiographers and provide services that should be rendered by an ideal council for radiographers.

Answers that were more on the positive side included:

- Appreciation of the available diagnostic services which are almost available country wide
- There is an ongoing process to address or improve the issue of career progression
- There is an international organisation that is willing to support the country with regards to radiation safety issues (IAEA)
- Radiologist services are outsourced for the reporting of CT images depending on the severity of the case
- The outbreak of the pandemic has improved utilisation of CT services thus exposing radiographers to a number of different cases and resulting in those working in CT learning a lot in the process
- Appreciation of government's effort in trying to improve radiology department by migrating all public healthcare facilities from analogue to computed radiography.

Prepared by: Thobile Seyama 18/08/2020