An Exploratory Study on Research Ethics at the Interface of Health Sciences amongst Postgraduates at a University of Technology in KwaZulu-Natal

Submitted in fulfilment of the requirement of the Degree of Master of Health Science: in the Faculty of Health Sciences at the Durban University of Technology

Lavisha Deonarian

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Supervisor: Date: 17.01.25

Professor R Bhagwan

Co-supervisor: Date: 17 January 2025

Professor M N Sibiya

DECLARATION

I, Lavisha Deonarian, declare that the research reported in this dissertation is my original work, except where otherwise indicated. All sources used or cited have been explicitly acknowledged employing complete references. This work has not been submitted previously to the Durban University of Technology or any other institution for any purpose.

Lavisha Deonarian

Signature

17 January 2025
Date

ABSTRACT

Research ethics are essential in terms of safeguarding research participants and maintaining the integrity of the scientific inquiry. It includes principles and guidelines designed to protect participants' rights and welfare while promoting ethical behaviour among researchers. In the Health Sciences, research ethics are crucial in terms of its direct impact on human health and the well-being of participants.

Despite the importance of research ethics, there is a significant lack of research and literature related to the readiness of postgraduate students in South Africa to address ethical challenges in their research. No studies have explored this readiness at the selected University of Technology.

This study investigated how postgraduate students conceptualised research ethics in the Health Sciences. Using a qualitative research design, data was collected through online interviews with fifteen postgraduate students from various disciplines within the Faculty of Health Sciences at the University of Technology in KwaZulu-Natal, in 2022.

The findings indicated that postgraduate students had a reasonably good understanding of research ethics in health science research. However, the study revealed that these students faced challenges in addressing critical ethical issues in their research. Additionally, there were varied experiences regarding supervision during the research process and differing perspectives on the training received in research ethics. The findings suggested a critical need for a dedicated research ethics module to be included as part of the postgraduate curriculum

DEDICATION

In loving memory of my father,

This Masters dissertation is dedicated to you, whose presence I deeply miss but whose guidance and teachings continue to resonate within me. Your unyielding belief in my abilities pushed me to surpass my limitations and strive for excellence. Your encouragement and sacrifices have shaped me into the person I am today.

This dissertation is a testament to the profound impact you had on my life. I wish I could share this achievement with you, to see the pride in your eyes, and to hear your words of wisdom. But I take solace in knowing that your spirit continues to guide me as I strive to make you proud.

Thank you, Dad, for your enduring love, your wisdom, and your unwavering support. Your legacy lives on through my academic pursuits, and I am forever grateful for the values and lessons you bestowed upon me. This dissertation is not just a scholarly endeavour; it is a heartfelt tribute to the extraordinary man you were and the profound influence you had on my life.

May your soul find eternal peace, and may your memory continue to inspire me to reach for the stars.

With deepest love and gratitude,

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ACRONYMS

DHET:	Department of Higher Education and Training
DRC**:**	Department Research Committee
FRC:	Faculty Research Committee
HEI:	Higher Education Institution
IREC:	Institutional Research Ethics Committee
PG:	Postgraduate
REC:	Research Ethics Committee
UOT:	University of Technology
NHREC**:**	National Health Research Ethics Council

CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

“Research is the basis of new knowledge, it exists through restless minds, who question every day everything that exists in the world we inhabit and also what exists outside of it” (Guzman, Teran and Rojas 2020: 37-41). The Office for Human Research Protections further described research as a methodical exploration that involves developing, testing, and evaluating ideas to create knowledge that can be applied broadly (Oermann *et al.* 2021: 342-347). According to Wenham *et al.* (2021: 142) research is essential for sustainable development, with science and innovation playing a pivotal role in driving economic and social progress, whether through advancements in medicine, such as vaccine development or industrial innovations.

According to Guzman, Teran and Rojas (2020: 37-41), higher education institutions (HEIs) have the responsibility of fostering students' "academic growth" through teaching and learning and promoting research as a means to accomplish this goal. According to the South African Department of Higher Education and Training (DHET), the South African higher education system is a dynamic and evolving sector that plays a vital role in the country's social and economic development (South Africa Department of Higher Education and Training 2013). At present, there are 26 public universities within the South African higher education sector (Bawa and Pouris 2023: 1-7). These institutions are categorized by DHET as consisting of 12 'traditional' universities, 8 universities of technology, and 6 comprehensive universities (Ashwin and Case 2018: 5). These institutions offer a range of academic programmes across various fields. A perusal of the different websites of these universities indicated the following fields of study namely, Business and Management Studies, Engineering and Technology, Health Sciences, Social Sciences, Natural and Physical Sciences, Humanities, Education and Teaching, Law and Legal Studies, Computer Science and Information Technology, Arts and Fine Arts, Agriculture and Environmental Sciences, Architecture, Tourism and Hospitality and Sports Science and Recreation. In South Africa, teaching, research, and community engagement continue to be core components of HEIs. There is also a growing emphasis

on incorporating income generation as a fundamental aspect of the function of the university (Swartz *et al.* 2019: 567-583).

Institutions in South Africa are mandated to provide academic programmes that equip graduates with exceptional knowledge, competencies, and skills to practice their professions and occupations both locally and globally (Moloi, Mkwanazi and Bojabotseha 2014: 469-475). South African universities offer higher certificates, advanced certificates, diplomas, advanced diplomas and Bachelor's Degrees at the undergraduate level (South Africa Department of Education 2007). At the postgraduate (PG) level, a PG Diploma, Honours Degree, Master's Degree and Doctoral Degrees are offered (Van Koller 2010: 157-174). PG degree programmes, provide the highest level of education to students, which helps HEIs acquire academic knowledge for their purposes, generate skilled professionals for the community, and serve as a resource for aspiring researchers (Denat and Tuğrul 2022: 51-60). Universities view PG programmes as a way to improve their research abilities, create skilled individuals who can help the economy grow, and solve complex problems like financial crises, climate change, and poverty (Mutula 2011: 184-190). Mutula (2011: 184-190) further indicated that the goal of PG research is to achieve several objectives namely, verify assumptions or observations, establish a theoretical framework for interpreting information presented by scholars, generate new knowledge and take responsibility for sharing and implementing the findings of research.

As humans, we have an inherent drive to seek knowledge about ourselves and our surroundings, and research is a natural way to fulfil this desire for understanding and improvement (Canadian Institutes of Health Research Natural Sciences and Engineering Research Council of Canada and Social Sciences and Humanities Research Council of Canada 2022: 1-263). Health Sciences research in particular, has been defined to include basic, clinical, and applied science related to human health and well-being, as well as investigations into disease determinants, prevention, detection, treatment, and management (Wenham *et al.* 2021: 142). According to Roets (2017: 847-853), the National Department of Health in South Africa indicated that health research includes inquiries that advance our understanding of biological or social processes in humans,

propose improved methods for providing health services, examine human pathology and the causes of diseases, investigate the impact of the environment on the human body, and contribute to the progress of pharmaceuticals, medicines, related substances, and applications of health technology. According to Dhai (2019: 34), there are several types of research relevant to healthcare, “basic research, clinical research, epidemiological research, social and behavioural research, interventional research, health services and operational research and observational research.” Much of this type of research involves ethical challenges where human participants or patients are involved. Health Science research in Africa is vital for two reasons. It can aid in reducing a country's dependence on primary commodities and agriculture, leading to the development of knowledge-based economies, which can be vital for macroeconomic growth and applying the findings of research domestically can lead to improvements in health, social welfare, and poverty reduction. The latter is particularly relevant for developing countries such as South Africa (Wenham *et al.* 2021: 142).

Research involving humans has undoubtedly enriched and improved our lives by making significant advances in our understanding of various fields, especially the social sciences, humanities, natural sciences, engineering, and health sciences (Canadian Institutes of Health Research Natural Sciences and Engineering Research Council of Canada and Social Sciences and Humanities Research Council of Canada 2022: 1-263). Much of the research in health and social sciences involves human participants. The South African National Department of Health, defined a human participant as a living individual, from whom a researcher collects data, either through interventions or interactions, or obtains identifiable private information (Roets 2017: 847-853). According to Doody and Noonan (2016: 803-807), ethics is a vital component of the research process to ensure the protection of society at large. Maintaining ethical behaviour during a study using integrity is crucial for academic and research activities as it serves as the fundamental pillar of a civilized society (Sivasubramaniam *et al.* 2021: 1-18). Kumbhar (2020: 511-513) succinctly described research ethics as “principles, standards, norms and guidelines that regulate scientific enquiry”. Ethics in research emerged due to the abundant history of unethical practices which led to the development of ethics codes, namely the Nuremberg

Code, Declaration of Helsinki and the Belmont Report dating back to the 19th century (Tangwa 2009: S2-S7; Doody and Noonan 2016: 803-807).

Research ethics has become an integral component of the academic growth of students, especially students conducting health research with human participants. Students and researchers are expected to follow the cardinal rules of ethics namely autonomy, beneficence, nonmaleficence and justice (Artal and Rubenfeld 2017: 107-114). Students require knowledge and a deeper understanding of research ethics and its various principles to conduct research with “moral and ethical rigour” (Hyytinen and Löfström 2017: 23-41).

As science and technology rapidly advance within the higher education context and knowledge spreads to improve scientific quality, universities must foster a culture of moral values among stakeholders, especially in the health sector (Baleghi Damavandi, Zameni and Taghvaee Yazdi 2019: 36-47). Following ethical norms in research is crucial as it helps achieve research goals, uphold collaboration values, ensure researcher accountability to the public, foster public research support, and express moral and social values (Krishnaswamy 2018: 1299-1300). Ensuring the safety of human participants is an ethical obligation in present-day research with humans and to meet this obligation, Research Ethics Committees (RECs) have been established by universities and research institutions (Davies 2020: 1-26). According to Makola and Ntoyanto-Tyatyantsi (2023: 208-217), in South Africa, the Department of Health offers guidance regarding the functions of RECs, including REC membership, operational processes, and standard procedures for RECs. Silaigwana and Wassenaar (2019: 107-116) further indicated that The National Health Research Ethics Council (NHREC) is a central organization that registers, audits, and supervises the activities of all RECs in South Africa. RECs are responsible for reviewing research proposals, maintaining ethical standards, approving or rejecting proposals, monitoring projects, addressing ethical issues, and stopping research if harm to participants is likely (Al Omari *et al.* 2021: 227-241; Makola and Ntoyanto-Tyatyantsi 2023: 208-217).

1.2 BACKGROUND OF THE STUDY

Research ethics is that branch of research that ensures the protection of human participants; ensures that research being conducted serves the interests of society; and ensures that ethical activities such as “management of risk; confidentiality; and informed consent” are ethically sound (Sharma 2019: 1-3). Since health research involves human participants, it is of utmost importance to protect their rights, dignity and welfare (Al Tajir 2018: 1-10; Than, Htike and Silverman 2020: 379-398). According to the South African National Department of Health, researchers are expected to adhere to the broad ethics principles namely beneficence and non-maleficence, autonomy and respect for dignity (South Africa National Department of Health 2015). It is essential that research, especially health research takes place with proper ethical oversight (Ajuwon 2020: 11-13). It is essential for students, especially those conducting research in the Health Sciences discipline, to have adequate knowledge of the principles of ethics (Makola and Ntoyanto-Tyatyantsi 2023: 208-217). Not only is knowledge of ethics imperative in protecting those who are willing to partake in research studies, but it also protects researchers against research misconduct and the institute they are registered with against possible legal action. This study aimed to explore PG student’s experience of ethics and ethical issues within the context of Health Science research studies.

1.3 CONTEXT OF THE STUDY

Higher education encompasses more than just education, as it also encompasses knowledge generation and community engagement as its core functions (Scott 2018: 1-17). Research has become a vital component of HEIs. Graduate students and researchers conducting research must adhere to principles and guidelines to ensure the proper conduct of research and the protection of research participants. According to Sivasubramaniam *et al.* (2021: 1-18), maintaining academic and research activities necessitates ethical behaviour with integrity. Ethical behaviour is crucial in fields like medicine, finance, and law, and its importance is increasingly recognized in all research disciplines (Sivasubramaniam *et al.* 2021: 1-18). According to Tarboush *et al.* (2020: 1-8), impactful research that benefits society must adhere to research ethics protocols. The

adherence to ethical principles in research, ensuring the protection of participants' rights and avoiding any infringement make this a valuable study.

It is vital that researchers who conduct research, especially those using human data comply with ethical guidelines and principles. According to Kaewkungwal and Adams (2019: 176-179), research should be designed, reviewed and conducted, and the results disseminated with scientific integrity and concordant with ethical considerations. Over the years, many health-based studies have resulted in adverse events or research misconduct, which led to the development of guidelines for the protection of human participants, animals and the environment. It has been reported that in some cases, researchers have become so involved in a study, that the rights and protection of participants are forgotten (George 2016: 615-618).

According to Makola and Ntoyanto-Tyatyantsi (2023: 208-217), despite previous studies that examine teaching methods, curricula, and the educational setting for PG students, there has been limited research on how students engage with the research ethics process and apply ethical standards to their research work. An understanding of the same is required to ensure that research ethics are upheld rigorously during PG and other studies. A perusal of the literature available online stressed the importance and need for ethics and stringent ethics review of protocols, especially health research studies involving humans. Compliance with research ethics standards is essential to prevent research misconduct and harm to research participants (Asman *et al.* 2019: 859-869). Various studies conducted internationally focused on graduate experience with research ethics (Petillion *et al.* 2017: 139-154), experiences, behaviours and perceptions of nurses regarding research ethics (Asman *et al.* 2019: 859-869), knowledge, attitudes and practices of healthcare ethics among PG students (Janakiram and Gardens 2014: 99-104), knowledge, attitude and practice about research ethics among Dental Faculty (Mallela *et al.* 2015: 52-56).

A limited amount of research has been undertaken in Africa, specifically in South Africa, with a focus on the understanding and experiences of PG students on responsible

conduct of research (Maitin-Casalis 2010; Makola and Ntoyanto-Tyatyantsi 2023: 208-217). In Nigeria, a study was conducted regarding research ethics education among graduate students (Osungbade, Ogundiran and Adebamowo 2014: 2736-2749). These studies have indicated that although there was a fair knowledge of research ethics among students and researchers, capacity building in research ethics for the relevant stakeholders is vital. There is a need to increase knowledge, awareness and acceptance of research ethics. A study investigating the knowledge of Health Sciences PG students to engage with the research ethics process has not been conducted in South Africa previously. In addition, Makola and Ntoyanto-Tyatyantsi (2023: 208-217) indicated that research carried out in places other than Africa and South Africa shouldn't be automatically assumed to be relevant or applicable to South Africa. Further, there has been no prior research that exists that investigates PG students' knowledge of research ethics at the University of Technology (UOT) in eThekwini. This led to the impetus for the research study and highlighted the research gap.

1.4 PROBLEM STATEMENT

A UOT in eThekwini was considered for this study. Research is a critical component within its strategic plan, to ensure its development as a leading HEI. Part of its vigorous strategic plan entails the inclusion of research in its PG degree programmes. Research ethics has become an important component in research, especially health research involving human participants (Tarboush *et al.* 2020: 1-8; Denat and Tuğrul 2022: 51-60). Whilst international codes, principles and guidelines exist to guide responsible research, research misconduct and adverse events still exist (Okonta and Rossouw 2013: 149-157). Whilst there is a plethora of literature that highlights these codes and principles (Tangwa 2009: S2-S7; Doody and Noonan 2016: 803-807; Artal and Rubenfeld 2017: 107-114; White 2020: 16-33), very few studies exist that examine the knowledge and preparedness of researchers, especially PG students in Health Sciences to deal with ethical issues in research. Despite the growing demand for increased research activity in South African universities and HEIs, there is a regrettable lack of research and literature on the readiness of PG students to navigate research ethics (Makola and Ntoyanto-Tyatyantsi 2023: 208-217). Moreover, there has been no study that has examined PG

students in Health Sciences experience with the research ethics process at the selected UOT.

1.5 AIM OF THE STUDY

The study aimed to explore PG students' experience of research ethics and ethical issues within the context of health sciences.

1.6 OBJECTIVES OF THE STUDY

The objectives of the study were to:

1. Explore how students conceptualise research ethics within the context of health sciences research.
2. Explore students' understanding of the various dimensions of ethics in Health Science research.
3. Inquire about their levels of preparedness within their disciplines to engage with ethical issues in research.
4. Inquire about their understanding of research misconduct activities.
5. Make recommendations regarding the integration of research ethics in Health Science PG programmes.

1.7 RESEARCH QUESTIONS

1. How do PG students conceptualise ethics in research?
2. What are PG students' understanding of the various dimensions of ethics in Health Science research?
3. What are PG students' levels of preparedness to engage with ethical issues in research?
4. What are PG students' knowledge of research misconduct activities?
5. What recommendations can be made regarding the teaching of research ethics in Health Sciences?

1.8 SIGNIFICANCE OF THE STUDY

Research in health has increased significantly during the last decade, which has highlighted the importance of research ethics (Than, Htike and Silverman 2020: 379-398). According to Hyytinen and Löfström (2017: 23-41), ethical research practices constitute a fundamental component of the skills anticipated from university graduates. In addition, for students conducting research in the area of Health Sciences, an understanding of research ethics is pivotal for providing fair and just healthcare (Lewis and Estis 2019: 617-620). Whilst some studies examine students' knowledge and attitudes regarding research ethics at international universities (El-Dessouky *et al.* 2011: 1-13; Janakiram and Gardens 2014: 99-104; Lotto 2018: 24-33; Hussain, Nirgude and Kotian 2019: 213-216; Kumbhar 2020: 511-513; Than, Htike and Silverman 2020: 379-398), little has been done on the African continent. In South Africa particularly, there is a paucity of literature about studies relating to the knowledge of students regarding research ethics. Studies conducted in South Africa with PG students have focused on PG supervision and challenges with supervision (Cekiso *et al.* 2019: 8-25; Murararaneza, Mtshali and Bvumbwe 2020: 1-8; Yende 2021: 135) and challenges experienced by PG students (Sengane and Havenga 2018: 1-9). Studies on research ethics have focused primarily on RECs (Mahomed and Labuschaigne 2019: 79-83; Silaigwana and Wassenaar 2019: 107-116; Davies 2020: 1-26). There was a single study conducted in South Africa that focused on PG students' experiences with research ethics (Makola and Ntoyanto-Tyatyantsi 2023: 208-217). The Universities of Technology are in their infancy about research ethics. Hence a study regarding the knowledge and preparedness of PG students to engage with ethical issues in Health Science Research is significant.

1.9 DEFINITIONS OF CONCEPTS

1.9.1 Research

Mallela *et al.* (2015: 52-56) defined research as "a detailed study of a subject, especially to find new information or to reach a new and better understanding."

1.9.2 Ethics

Tangwa (2009: S2-S7) defined research ethics as “that branch of philosophy which deals with the morality of human actions or behaviour” and “study of the fundamental principles or morality and their application in actual concrete situations.” Research ethics aim to protect participants' rights, dignity, and well-being, uphold research integrity and validity, promote values like honesty and accountability, and address issues such as informed consent, confidentiality, harm prevention, and misconduct (Caruth 2015: 22-33; Makola and Ntoyanto-Tyatyantsi 2023: 208-217).

1.9.3 Research Ethics Principles

Tangwa (2009: S2-S7) defined a principle as a “general rule or formula that applies to many particular cases/ instances.” There are four principles of ethics namely, autonomy, beneficence, nonmaleficence and justice (Artal and Rubenfeld 2017: 107-114).

1.9.4 Research Misconduct

Research misconduct refers to falsification, fabrication, and plagiarism in research, as well as deviations from standard practices in conducting and reporting studies (Pirani 2024: 96-104).

1.9.5 Postgraduate Student

A postgraduate student is an individual who has completed an undergraduate qualification, such as a bachelor's degree, and is pursuing further studies at an advanced level (Evans *et al.* 2018: 249-265). At the postgraduate level, a Postgraduate Diploma, Honours Degree, Master’s Degree and Doctoral Degrees are offered.

1.9.6 University of Technology

A university of technology focuses on research-based learning, offers courses designed to meet industry needs, conducts practical research to solve real-world problems, allows students to join or leave at different levels, emphasizes vocational and professional

training, and values technological skills as much as critical thinking (Lategan 2008: 61-78).

1.9.7 Health Sciences

Health sciences is a multidisciplinary field that combines knowledge from biological, physical, behavioral, and social sciences to explore health, healthcare systems, disease prevention, and the promotion of well-being. It includes both theoretical and practical disciplines, equipping graduates for careers in research, healthcare practice, and public health (Hiatt *et al.* 2017: 462-467).

1.9.8 Experience

Experience is the knowledge and skills gained over time through participation in various events and situations, shaping how individuals grow and respond to the world (Wolf *et al.* 2021: 16-29). In this study, experience refers to postgraduate students' understanding of different aspects of ethics in health research, including research misconduct, their preparedness levels, and their perspectives on integrating research ethics into health sciences education.

1.10 OVERVIEW OF THE RESEARCH METHODOLOGY

This study used qualitative research methodology. It was conducted amongst PG students registered in the year 2022 in the Faculty of Health Sciences at a UOT in eThekwini. A non-probability sampling strategy was used to recruit PG students registered in 2022. Semi-structured interviews were used to collect data from participants. Convenience sampling was employed for this study. The data was analysed using thematic analysis.

1.11 STRUCTURE OF THE RESEARCH PROJECT

Chapter 1 - Introduction
Chapter 2 - Literature Review
Chapter 3 - Research Methodology

Chapter 4 - Presentation and discussion of findings
Chapter 5 - Recommendations and conclusion of the study

1.12 SUMMARY OF THE CHAPTER

This introduction provided an overview of the study undertaken. The background of the study and the problem statement were highlighted. In addition, the aims and objectives, research questions and the significance of the study were presented. The researcher also highlighted key definitions and an overview of the research methodology. In the chapter to follow, the researcher provides an extensive discussion of the literature review for the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

A literature review can be defined as a thorough evaluation of the existing body of knowledge on a particular topic (Winchester and Salji 2016: 308-312). For a researcher, it is crucial to undertake a literature review to formulate a research concept, synthesize existing knowledge on a topic, pinpoint any gaps in understanding, and determine how the research will contribute to advancing knowledge in the field (Winchester and Salji 2016: 308-312). According to Maggio, Sewell and Artino Jr (2016: 297-303), the literature review supports the researcher in defining precise objectives, demonstrating ample preparation, selecting appropriate methods, presenting relevant results, and participating in reflective critique. A literature review is conducted by perusing sources such as research papers, review articles, academic texts and reference databases (Winchester and Salji 2016: 308-312).

2.2 SOURCES OF REVIEWED LITERATURE

For this literature review, the researcher accessed research papers via Google Scholar, Science Direct, Pub Med and the library at the UOT in eThekwini. Academic texts were sourced via Google Scholar and through purchases via academic bookshops. The following keywords were used to conduct the literature review: research ethics, history of research ethics, the importance of research ethics, principles of research ethics, informed consent, respect for participants, voluntary participation and no coercion, anonymity and confidentiality in research, research misconduct, research ethics education and research ethics education in South Africa.

The literature review begins with a brief introduction to the research followed by an introduction to research ethics. The history of research ethics is then highlighted followed by the research ethics codes. The researcher then goes on to highlight the cardinal research ethics principles, which all researchers must adhere to. A discussion on research ethics misconduct and research ethics education follows.

2.3 BRIEF INTRODUCTION TO RESEARCH

Research, loosely defined as the quest for knowledge has increased rapidly in recent decades, especially in health research (Caruth 2015: 23-33). According to Dhai (2019: 33), the Medical Research Council of South Africa defined research as “a systematic investigation, including research development, testing and evaluation designed to develop or contribute to generalizable knowledge.” Vallejo *et al.* (2020: 83-89), indicated that research enhances human understanding and enriches scientific knowledge, fostering progress, improving quality of life, promoting health, and driving innovation and it is of utmost importance to be promoted at all levels of education.

HEIs carry a significant ethical obligation to enhance awareness, knowledge, skills, and values necessary for shaping an equitable and sustainable future (Singh and Stückelberger 2017: 74). According to the South African DHET, universities have two key roles: equipping citizens with advanced skills for the job market and serving as hubs of research excellence (South Africa Department of Higher Education and Training 2013). Universities are known as creators of new knowledge, and they assess and uncover innovative applications for existing knowledge to sustain South Africa's independence and creativity. Additionally, South African universities are required to promote social justice and establish fairness as a means of addressing the negative effects of apartheid (Chetty and Pather 2015: 1-6). HEIs have a responsibility to promote academic growth and one way to achieve this is through research, it is imperative to train competent professionals and honest researchers (Guzman, Teran and Rojas 2020: 37-41) .

Research holds a significant role in academic training, contributing to the enhancement of learning processes in university students (Guzman, Teran and Rojas 2020: 37-41) . Makola and Ntoyanto-Tyatyantsi (2023: 208-217) stated that following important moral rules like treating people well, doing good without harm, and being fair while doing research with humans is the very foundation of that research. For research to take place, ethics approval is required from a REC to ensure that the ‘rights, safety and wellbeing’ of participants are protected (Doody and Noonan 2016: 803-807).

Historically, researchers trusted that the knowledge generated through their studies was founded on truth. However, according to Lategan (2012 cited in Caruth 2015: 23-33), misconduct in university research has led to mistrust in the research community which led to a focus on research ethics. In addition, the history of research ethics has demonstrated that there have been “repeated cycles of harm” caused to participants due to unethical research being conducted (Gelling 2020: 1019-1022). Gelling (2020: 1019-1022) further stated that researchers themselves are not fully aware of whether their research is ethical or not, another factor is that researchers may be aware of the risks associated with their studies but still go ahead with the research. One such example is the brutal experiments conducted by Nazi physicians, who were considered reputable researchers, during World War II (Sharma 2019: 1-3).

2.4 RESEARCH ETHICS

2.4.1 Definition of Research Ethics

It is believed that the word “ethics” is derived from the Greek word, ethos, which means custom or character (Avasthi *et al.* 2013: 86-91). There is consensus around how ethics is understood in the literature. A perusal of the literature reflects the following characteristics, the morality of human actions or behaviour (Tangwa 2009: S2-S7); questions of morality (Vanclay, Baines and Taylor 2013: 243-253), moral principles (Cho and Shin 2014: 484-495); norms for conduct (Mallela *et al.* 2015: 52-56), behaviours, processes and protection of human subjects (Caruth 2015: 22-33) and set of rules and standards that define what is morally acceptable (Naidoo and Naidoo 2017: 1732-1740). Loosely defined, ethics can be described as that branch of philosophy of how choices are made between what is right and what is wrong (Caruth 2015: 23-33). Research ethics aims to protect participants' rights, dignity, and well-being, ensure the integrity and validity of research, promote values like honesty and accountability, and address concerns such as informed consent, confidentiality, harm prevention, and misconduct (Caruth 2015: 23-33; Makola and Ntoyanto-Tyatyantsi 2023: 208-217).

2.4.2 The History of Ethics

Ethics, particularly research ethics, gained prominence as a field of concern after the atrocities carried out on human beings in the name of medical research. According to Tangwa (2009: S2-S7), medical experiments and interventions were uncontrolled and unregulated up until the 19th century. According to Gelling (2020: 1019-1022), research ethics was given very little consideration before the 1800s when research or experimentation was carried out using human participants, however, this changed in the 19th century when researchers considered the ethical implications of their research. Marianna (2011: 3-14) further stated that the researcher's ethical attitudes only drew the attention of society after the 1940s due to human exploitation. Examining the evolution of research ethics requires a look at some of history's most significant and controversial studies, such as the Tuskegee Syphilis Trials, the World War II Experiments, and the Willowbrook Study, which follows.

2.4.2.1 Tuskegee Syphilis Trials

The Tuskegee Syphilis Trial, initiated by the United States Public Health Service was conducted from 1932-1972 and was entitled "The Tuskegee Study of Untreated Syphilis in the Negro Male" (Frazier 2020: 280-296). According to Frazier (2020: 280-296), this study was conducted to conclude whether there were differences regarding the progression of the disease between Blacks and Whites. Resnik (2018: 27) stated that this study was conducted as it was not as well studied in Blacks as it was in Whites. Six hundred African American men, mostly illiterate, were recruited for the study, participants were not informed that they had the disease, nor were they given treatment for syphilis (Resnik 2018: 27; Sharma 2019: 1-3; Frazier 2020: 280-296). Participants were informed that they were receiving treatment for "bad blood" and were given free lunches and burials (Resnik 2018: 27). According to Sharma (2019: 1-3), "28 men died of syphilis; 100 died of related complications; wives of 40 men were infected and 19 children were born with congenital syphilis." Sharma (2019: 1-3), further stated that although penicillin was available, it was not administered to the research participants, making this a "wholesale violation of human rights." This study continued for 40 years and was stopped in 1972.

2.4.2.2 World War II Nazi Experiments

The most dreadful of all atrocities was possibly conducted by German physicians who used prisoners from a concentration camp for medical experimentation (Tangwa 2009: S2-S7; Avasthi *et al.* 2013:86-91). During World War II, prisoners were used for deadly military experiments designed to assess human tolerance to extreme physiological or adverse conditions, including torture, for the benefit of the military (Artal and Rubenfeld 2017: 107-114). One such example was the exposure of participants to ice-water tanks or they were made to stand naked in below-freezing temperatures in an attempt to learn how to treat hypothermia (Doody and Noonan 2016: 803-807).

2.4.2.3 The Willowbrook Study

The Willowbrook study entailed the infection of mentally disabled children with hepatitis without their knowledge (Doody and Noonan 2016: 803-807; Artal and Rubenfeld 2017: 107-114). According to Doody and Noonan (2016: 803-807) this study was conducted in an attempt to learn the progression of the infection and to test a potential vaccine.

2.5 RESEARCH ETHICS CODES

In response to poor research practice and human exploitation, research ethics codes emerged in the 19th century to ensure the protection of participants (Doody and Noonan 2016: 803-807). Marianna (2011: 3-14) further stated that these professional codes and laws were introduced to prevent the unethical exploitation of human lives. These are discussed below.

2.5.1 The Nuremberg Code

Emerging from a war crimes trial, the Nuremberg Code established the benchmark for all subsequent efforts to govern human experimentation (Annas 2018: 42-46). Al Tajir (2018: 1-10) stated that the Nuremberg Code is recognized as the inaugural document establishing ethical standards for experiments involving humans. According to Resnik

(2018: 22), the Nuremberg Code served as a basis for prosecuting Nazi researchers for war crimes. The Nuremberg Code formed in 1947, lays down 10 principles to be followed by researchers which include, amongst others, voluntary consent for participants, allowance for withdrawal of participants from a study, the benefits of a particular study must outweigh the risks, the research must benefit society, and the research should be terminated should it result in harm or injury (Tangwa 2009: S2-S7; Mandal, Acharya and Parija 2011: 2-3; Artal and Rubenfeld 2017: 107-114; Resnik 2018: 22; Sivasubramaniam *et al.* 2021: 1-18). According to Sharma (2019: 1-3) the Nuremberg Code stated that "the voluntary consent of human subject is essential" highlighting the need for participant consent and that the benefits of research must outweigh the risks. According to Gelling (2020: 1019-1022), the Nuremberg Code saw limited adoption and did not exert a substantial influence on the research being carried out. Nichol, Mwaka and Luyckx (2021: 272-281) further stated that the Nuremberg Code had limitations.

2.5.2 Declaration of Helsinki

According to Avasthi *et al*. (2013: 86-91), even though the Nuremberg Code was put into place to protect research participants, unethical research practices continued. This led to the formation of guidelines by the World Medical Association called the Declaration of Helsinki in 1964 (Dhai 2019: 44; Nichol, Mwaka and Luyckx 2021: 272-281). Nichol, Mwaka and Luyckx (2021: 272-281) further stated that the Declaration was adopted to address the limitations of the Nuremberg Code and to expand on the protection of human participants in research. According to Bukusi, Manabe and Zunt (2019: 42-47), the declaration related specifically to physicians and their involvement of patients in research. This Declaration contained a set of 32 principles, which covered issues such as informed consent, confidentiality of data, vulnerable populations and voluntary participation in a study (World Medical Association, 2001: 373-374). Sharma (2019: 1-3) stated that the Declaration was revised in "1975, 1983, 1989, 1996, 2000, 2002 and 2008 and is the basis of good clinical practices used today." The Declaration of Helsinki, revised at the 75th WMA General Assembly in Helsinki, Finland, in October 2024, is an ethical document that has served as the most influential code of ethics guiding medical research for over six decades .(Bibbins-Domingo, Brubaker and Curfman 2024: 30-31).

2.5.3 The Belmont Report

The Belmont Report, issued by the National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research, was mandated in a public law on July 12, 1979 (Beauchamp 2020: 240-250). According to Beauchamp (2020: 240-250), reports of “possible abuse” involving human participants in the 1970’s created backlash from the public. This together with the atrocities of the Tuskegee Syphilis Trials led to the development of the Belmont Report. Mandal, Acharya and Parija (2011: 107-114) stated that perhaps the turning point in the development of consensus for ethical conduct in research was due to the Tuskegee Syphilis Trials conducted from 1932-1972. During this period African American males who were infected with syphilis were monitored over 40 years without them being aware of their disease. This led to the development of the Belmont Report, which was published in 1979 (Mandal, Acharya and Parija 2011: 107-114; Avasthi *et al*. 2013: 86-91). The Belmont report is a set of basic research principles which include respect for persons, beneficence and justice (Vanclay, Baines and Taylor 2013: 243-253; Coetzee, Hoffmann and de Roubaix 2015: 389-394; Resnik 2018: 27; Sharma 2019: 1-3; Nichol, Mwaka and Luyckx 2021: 272-281). Beauchamp (2020: 240-250) indicated that these moral principles developed from discussions at a retreat of some members of the National Commission “held on February 13–16, 1976, at the Smithsonian Institution’s Belmont Conference Center in Elkridge, Maryland.”

2.5.4 International Ethical Guidelines for Biomedical Research Involving Human Subjects

The Council for International Organisations of Medical Sciences (CIOMS) developed the International Ethical Guidelines for Biomedical Research Involving Human Subjects in 1982 (Sharma 2019: 1-3). According to Schuklenk (2017: 169-172) these guidelines were revised in 2016 and relate mainly to “ethical justification and scientific validity of research; ethical review; informed consent; vulnerability of individuals; groups, communities and populations; women as research subjects; equity regarding burdens and benefits; choice of control in clinical trials; confidentiality; compensation for injury; strengthening of

national or local capacity for ethical review; and obligations of sponsors to provide health care services."

2.6 CARDINAL ETHICAL PRINCIPLES

According to Artal and Rubenfeld (2017: 107-114), four cardinal ethics principles are followed in research namely autonomy or respect for others, beneficence, non-maleficence and justice. These are discussed below.

2.6.1 Autonomy or respect for others

Autonomy or respect for others, which refers to an individual's right to make informed decisions after being adequately provided with information and time, without coercion (Tangwa 2009: S2-S7; Doody and Noonan 2016: 803-807; Artal and Rubenfeld 2017: 107-114; Sharma 2019: 1-3). According to Resnik (2018: 27), respect for autonomy/ persons requires informed consent from participants as well as protection for those participants who cannot consent. Sharma (2019: 1-3) indicated that researchers must ensure the welfare of participants with "diminished autonomy." Respect for autonomy in research ethics includes safeguarding participants' confidentiality, dignity, and privacy (Dhai 2019: 61)

2.6.2 Beneficence

Beneficence refers to "doing good" (Tangwa 2009: S2-S7). According to Marianna (2011: 3-14), the ethical principle of beneficence is captured in the Hippocratic directive to "do good and avoid harm." In other words, beneficence is a moral obligation to take steps to help others, for the betterment of both participants and society at large (Doody and Noonan 2016: 803-807). Beneficence requires optimizing research benefits while minimizing associated risks (Resnik 2018: 27; Sharma 2019: 1-3).

2.6.3 Non-maleficence

Non-maleficence means “avoiding evil/ harm” (Tangwa 2009: S2-S7). This principle involves not causing harm or exposing individuals to unnecessary risks.

2.6.4 Justice

Justice refers to “fairness” (Tangwa 2009: S2-S7). Human beings should be treated fairly. According to Resnik (2018: 27) justice necessitates the equitable distribution of research benefits and burdens.

2.6.5 Basic Requirements and Principles of Ethical Research

According to Artal and Rubenfeld (2017: 107-114), there are basic requirements that ethical research should address. These include scientific validity, social value, minimum human risk, benefits should outweigh the risk, informed consent, protection of confidentiality and privacy, equitable participant selection; scientific or moral justification for including or excluding participants from research, protection from harm or exploitation of vulnerable participants: children, prisoners, and mentally disabled participants, data integrity and safety monitoring and independent review (Institutional Review Board oversight). However, according to Baines, Taylor and Vanclay (2013: 254-260), 18 principles govern research involving humans. These include respect for participants, informed consent, specific permission required for audio- or video recording, voluntary participation and no coercion, right to withdraw, full disclosure of funding sources, no harm to participants, avoidance of undue intrusion, no use of deception, presumption and preservation of anonymity, right to check and modify a transcript, confidentiality of personal matters; data protection, enabling participation, ethical governance, grievance procedure, appropriateness of research methodology, full reporting of methods.

2.6.5.1 Respect for Participants

Respect for participants is regulated through informed consent practices which are often set up as an “ethical panacea and a toll to counter autocratic and paternalistic medical

practices” (Burr and Gibson 2018: 241-255). This principle makes way for the participant to make an informed decision to partake in a study or not based on the information provided, without any external influence (Al Tajir 2018: 1-10). Researchers have to respect participants especially those with diminished autonomy (Vanclay, Baines and Taylor 2013: 243-253). Respect for participants also includes not judging or discrediting them and ensuring that their views and responses are captured correctly (Vanclay, Baines and Taylor 2013: 243-253).

2.6.5.2. Informed Consent

The concept of informed consent, coined in 1957, is rooted in the principle of autonomy, emphasizing the importance of respecting individuals and acknowledging their dignity (Cocanour 2017: 993-997; Dhai 2019). Wagoro and Bhatt (2012: 45-50) further define informed consent as a “precondition for ethical and scientific research involving human participants.” Simply put, informed consent is the process whereby information about the procedures, risks and benefits of a study is provided to a participant for the participant to decide whether to partake in the study or not (Baines, Taylor and Vanclay 2013: 254-260; Naidoo and Naidoo 2017: 1732-1740; Tulyakul and Meepring 2020: 86-90). Participants must be able to understand the information provided, make a decision, communicate this decision and understand the consequences of their decision (Cocanour 2017: 993-997). Informed consent serves as a method to safeguard a participant's right to autonomy (Marianna 2011: 3-14). The objective of informed consent is to safeguard participants against exploitation, abuse, force, fraud and coercion (Wagoro and Bhatt 2012: 45-50; Tulyakul and Meepring 2020: 86-90). According to Hussain, Nirgude and Kotian (2019: 213-216), a well-written informed consent document is the foundation of “ethically conducted research” as it provides the participant with relevant information to make an informed decision to partake in the study. Tulyakul and Meepring (2020: 86-90) state that an informed consent document should encompass details such as the study's purpose, procedures, potential conflicts of interest, risks, compensation, expected benefits, a confidentiality statement, and the researchers' contact information. In addition to this, Kaewkungwal and Adams (2019: 176-197) stated that an informed consent document should indicate the participants' right to refuse to partake in a study, the right to withdraw

from a study at any given time without any consequences, the information must be written and easy to understand and how the data will be stored and for how long. According to Dhai (2019: 86), informed consent comprises 4 essential elements i.e., full disclosure, understanding and appreciation, voluntariness and capacity. Cocanour (2017: 993-997) stated that there are 3 criteria for informed consent, “the patient must be competent, adequately informed and not coerced.” In the event of research involving children, informed consent must be obtained from the parent/ guardian and assent must be provided by the child/minor (Dhai 2019: 90). In the event of a withdrawal, participant data must also be removed from the analysis (Vanclay, Baines and Taylor 2013: 243-253). For interviews which are recorded or video-recorded, participants must provide approval for them to be audio-recorded or video-recorded (Vanclay, Baines and Taylor 2013: 243-253).

2.6.5.2.1 History of Informed Consent

According to Burr and Gibson (2018: 241-255), the principle of no harm first appeared in the American Medical Association Code of Conduct of 1847. The author explained that as per the code, a doctor/ physician is to withhold information from the patient to not harm. Burr and Gibson (2018: 241-255) went on to explain that in the years to come, especially from 1903, the spotlight was shone on informed consent due to the many legal cases where patients were not fully informed of medical procedures that were carried out on them. According to Cocanour (2017: 993-997) the physician-patient interaction, originally grounded in the ethical concept of beneficence, evolved over the 19th and 20th centuries due to changes in case law and society, leading to the incorporation of respect for autonomy and the establishment of informed consent. The Nuremberg Code of 1947 which arose out of human experiments carried out during the Second World War by Nazis’ is considered the pivotal point in the history of consent in research (Burr and Gibson (2018: 241-255). According to Cocanour (2017: 993-997), the concept of informed consent first appeared in 1957. Tulyakul and Meepring (2020: 86-90) stated that although research ethics guidelines exist for the informed consent process and its requirements, ethics issues and harm still arise during the informed consent process. A study conducted

by Wagoro and Bhatt (2012: 45-50) indicated that students concentrated more on items that had a positive influence on patient participation than those items that would have a negative influence and it was feared that students merely viewed informed consent as fulfilling a requirement by the higher education institute and as a legal protection tool.

2.6.5.3 Voluntary Participant and No Coercion

According to Dhai (2019: 90), participation must be voluntary and no coercion must be used when recruiting participants. In addition, participants must not be threatened or harmed for non-participation. Vanclay, Baines and Taylor (2013: 243-253) further stated that non-coercion does not mean that participants should not be paid for participating in a study, but payment should be fair and not excessive which would not constitute a bribe.

2.6.5.4 Anonymity and Confidentiality

Anonymity and confidentiality must be assured to participants during any research study. Anonymity refers to a non-disclosure of the identity of participants whilst confidentiality refers to not disclosing the information provided by participants (Baines, Taylor and Vanclay 2013: 254-260). Avasthi et al. (2013: 86-91) asserted that the best manner to ensure confidentiality and to prevent the disclosure of personal information of participants is to remove all identifying information from research documentation. Participants must therefore be assured that the data gathered is for the study and will ensure their safety (Naidoo and Naidoo 2017: 1732-1740).

2.7 RESEARCH ETHICS IN SOUTH AFRICA

Conducting ethically and scientifically sound research in any country requires adherence to a framework grounded in global ethical principles, while also aligning with local laws, regulations, and cultural norms (Ogunrin, Ogundiran and Adebamowo 2013: 1-17). Health research involving human participants must be steered by ethical principles and a governance system must be put in place to provide mechanisms for regulatory and ethical oversight for the protection of research participants in a country (Than, Htike and Silverman 2020: 379-398). Regulations and guidelines regarding ethics in research in

South Africa comply with international standards. The NHREC formed in 2006, according to the National Health Act of South Africa is a regulatory body that oversees “health research” conducted in the country (Burgess, Rennie and Moodley 2023: 11). The NHREC is responsible for setting norms and standards for clinical trials as well as research on humans and animals (South Africa National Department of Health 2015). The Council is also responsible for determining guidelines to facilitate best practice for RECs and has formulated guidelines for researchers and RECs in the country (Moodley and Myer 2007: 1-8; Burgess, Rennie and Moodley 2023: 11; Knight 2023: 182). These guidelines endorse the principles outlined in The Belmont Report, Declaration of Helsinki 2013, Medical Research Council: Guidelines on Ethics for Medical Research: HIV Preventive Vaccine Research and the Singapore Statement on Research Integrity (South Africa National Department of Health 2015). The NHREC also acts as a body responsible for addressing complaints and violations of research ethics through adjudication and disciplinary measures (Knight 2019: 1-3).

2.7.1 Research Ethics Committees

Since the 1970s, it has been acknowledged that professional organizations should create rules to guarantee good scientific practices and offer supervision (Augustine *et al.* 2023: 1-14). An essential element of overseeing health research with human participants is the ethical review conducted by a REC (Thurtle *et al.* 2021: 1-5). The Declaration of Helsinki highlighted the significance of an independent and properly constituted REC with the authority to oversee ongoing studies, including serious adverse events, ensuring the protection of human participants' interests and the ethical soundness and relevance of the research (Chaudhry *et al.* 2022: 1-8). Roets (2017: 847-853) further described a REC as an independent and multidisciplinary committee, responsible for evaluating research proposals that involve human participants and ensuring the protection of participants' dignity, rights, and well-being. Currently, there are 46 RECs registered with the NHREC in South Africa, responsible for reviewing health research involving human participants (Burgess, Rennie and Moodley 2023: 11). In South Africa, RECs must have at least nine members from various fields, with diverse cultural and ethnic representation, a balanced

gender mix, community members, non-human participant researchers, and individuals from different disciplines; all committee members should undergo research ethics training every three years (Burgess, Rennie and Moodley 2023: 11).

In the field of research ethics, Ezekiel Emanuel's seven principles serve as a comprehensive framework for guiding ethical research conduct (Tolchin *et al.* 2020: 661-669) and to support RECs and researchers in the review process (Tsoka-Gwegweni and Wassenaar 2014: 36-45). Building upon the foundational philosophies found in significant codes and declarations like the Nuremberg Code, Declaration of Helsinki, Belmont Report, and other related documents concerning research involving human participants, seven principles were proposed to guide the ethical analysis of research involving human participants (Emanuel, Wendler and Grady 2000: 2701-2711). These are social value, scientific validity, fair participant selection, favourable risk-benefit ratio, independent review, informed consent, and respect for participants (Emanuel, Wendler and Grady 2000: 2701-2711; Tolchin *et al.* 2020: 661-669). According to Tsoka-Gwegweni and Wassenaar (2014: 36-45) the original version of the framework had seven principles and was revised to include collaborative partnership.

2.8 RESEARCH MISCONDUCT

Similar to other human endeavours, research is prone to unethical behaviour (Yeo-Teh and Tang 2021: 55-65). Research misconduct has been defined as “fabrication, falsification or plagiarism in proposing, performing or reviewing research or in reporting research results” (Ana *et al.* 2013: 1-3; Aubert Bonn, Godecharle and Dierickx 2017: 33-44; Resnik 2019: 123-137; Omutoko 2020: 41-55). Stavale et al. (2019: 1-16) further stated that misconduct takes place when elements such as plagiarism, data manipulation, fabrication, inadequate study reporting, and lack of transparency are incorporated into the research process. These include types of wrongdoing such as deliberate breaches of research protocols, falsifying resumes, improperly attributing authorship, and failure to disclose conflicts of interest (Felaefel et al. 2018: 71-87). According to Resnik (2015 as cited in Dal Re 2020), the definition of research misconduct includes other types of misconduct, such as unethical authorship or publication practices, conflicts of interest

mismanagement and another 11 unethical behaviours. According to Todd et al. (2017: 297-321), research misconduct can have negative consequences not only on the researcher and institution but also on the public's ability to trust research findings and irresponsible research conduct can undermine the integrity of research. Asman et al. (2019: 859-869) further re-iterated that research misconduct causes harm in various ways: from a scientific standpoint, it influences the reliability of results, the professionalism of researchers, future research endeavours, and the public perception of academic work and academia. Asman *et al*. (2019: 859-869) also asserted that research misconduct could result in harm to the research participants and to future patients. According to Stavale *et al*. (2019: 1-16), research misconduct has "scientific, social and economic impacts" where, economically, billions of dollars can be wasted on publications; socially, participants can be exposed to incorrect medical decisions and scientifically, unethical research could lead to incorrect conclusions and compromised scientific knowledge. Drolet *et al.* (2023: 269-292) further reiterated that misconduct can diminish the trustworthiness of research and result in adverse effects for various stakeholders, including researchers, research assistants, participants, academic institutions, and society in general.

It has been stated that countries with a lack of research integrity policies are more likely to experience misconduct in research (Asman *et al.* 2019: 859-869). According to Omutoko (2020: 41-55), research misconduct is a global challenge and prevention of such activities is not the responsibility of a single researcher or institution, it is a concerted effort. Ana *et al*. (2013: 1-6) further re-iterated that research is a global activity hence research misconduct becomes a global problem. Dal-Ré *et al*. (2020: 1-12) reported that between 2000 and 2017, 15000 articles were published regarding research misconduct. A study conducted by Felaefel *et al.* (2018: 71-87) indicated that scientific misconduct is a major issue in the Middle East. A lack of prior ethics training was found to be the predictor of research misconduct. Omutoko (2020: 41-55) reported the following cases of misconduct: in South Africa in the early 1990s, a study by Dr Werner and Bezwoda data was falsified and fabricated, Dr Jon Sudbo was found to have fabricated data for his study in 2005 which was published in The Lancet and "in Africa between 2015 and 2019, 32

papers were retracted for reasons ranging from falsification, fabrication, plagiarism, errors in data and data analysis, lack of Institutional Review Board approval to limited or no information." According to Torrence *et al.* (2017: 269-296), research ethics training is one of the solutions to the problem of research misconduct. Torrence et al. (2017: 269-296) further stated that this type of ethics education seeks to cultivate trainees' understanding of ethics in science, promote research integrity, and empower researchers with the knowledge and skills to navigate ethical situations effectively.

2.9 RESEARCH ETHICS EDUCATION

According to Lotto (2018: 24-33), in an attempt to address or avoid research misconduct, there has been huge support for formal ethical training for researchers. Ethics training is essential to ensure research integrity (Olesen, Amin and Mahadi 2019: 1111-1124). According to Torrence *et al.* (2017: 269-296), training in research ethics requires an "organised and structured approach" and content such as facts, concepts, principles and processes should be part of the instructional content. A study conducted by Ramalingam, Bhuvaneswari and Sankaran (2014: XC01-XC03) indicated that ethics training is vital at the undergraduate level and that a short ethics training workshop can be effective. A qualitative review of instructional methods used for research ethics education revealed that active participation, case-based studies, a combination of individual and group approaches and a small number of instructional methods were most effective (Todd *et al.* 2017: 297-321). A study conducted at a South African University, regarding the evaluation of Undergraduate Health Science Research Methodology Programmes, concluded that a research methodology course including research ethics aspects should be completed before the final year of Health Sciences Undergraduate Programmes to ensure that students know to prepare the research protocol which is required in the final year of undergraduate studies (Coetzee, Hoffmann and de Roubaix 2015: 389-394).

Nikravanfard, Khorasanizadeh and Zendehdel (2017: 77-83) reported that a survey of 23 schools in the United States of America revealed that half of the Universities required ethics training for graduation. A survey of 144 medical schools in Brazil showed that 80% use active learning methodologies and pay attention to research ethics (Novaes *et al*.

2013 cited in Nikravanfard, Khorasanizadeh and Zendehdel 2017: 77-83). Cho and Shin (2014: 484-495) reported that a study done with 240 Masters and Doctoral students in Korea showed a low rate of ethics education. Munoli, Niveditha and Deepthi (2017: 913-918) shared that a study conducted to assess the knowledge, attitudes and practices regarding research ethics reported a knowledge gap in research ethics guidelines. Another study conducted by Bhuvaneshwari, Vijaya and Hema (2011 cited by Kaewkungwal and Adams 2019: 176-197), revealed that 61% of the researchers recruited for the study were aware that informed consent was compulsory, 60% of the participant researchers knew that participants have the right to be informed about the risks and benefits of the study methods and 50% of the participant researchers were aware of participants rights to withdraw from a study. A study conducted by Kaewkungwal and Adams (2019: 176-197) revealed that REC members gave importance to three core ethical considerations i.e., risk/benefit, vulnerability and confidentiality/privacy. This study concluded that differences in perspectives on ethics guidelines will affect the proposal development.

2.10 STUDIES ON THE AFRICAN CONTINENT

A study related to the knowledge and attitudes of PG students in Kenya on ethics in mental health research concluded that there is a relatively low knowledge of ethics and internal ethics guidelines (Amugune and Verster 2016: 65-68). Yet another study conducted at the University of Ibadan, Southwest Nigeria, concluded that although knowledge of research ethics was above average amongst the participants, it is essential to build capacity amongst graduate students to enable responsible conduct of research (Osungbade, Ogundiran and Adebamowo 2014: 2736-2749). Makola and Ntoyanto-Tyatyantsi (2023: 208-217) study on PG students' experiences with research ethics in South Africa revealed varying perspectives on the adequacy of their training, support from supervisors, and the implementation of research ethics principles in their projects, with many participants noting deficiencies in teaching and support. More importantly, this study revealed that PG students in South Africa need more research ethics training.

2.11 SUMMARY OF THE CHAPTER

The literature review delved into research and research ethics in higher education, focusing on PG students. It provided an overview of the history and principles of ethics, including misconduct. The chapter also discussed the role of ethics governing bodies in South Africa and the functions of RECs. Chapter three, which follows, will outline the research methodology used to guide the study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 INTRODUCTION

Rajasekar, Philominathan and Chinnathambi (2013: 5) described research methodology as the methodologies used by researchers in their efforts to describe, explain, and predict phenomena. According to Almalki (2016: 288-296), a methodology is the set of rules and ideas that guide how research is done, how data is understood, and how conclusions are made. In short, a research methodology is a detailed plan of the procedures and tasks on how a study will be carried out to answer the research questions. For this study, a qualitative research approach was utilized. This approach enabled a rich and detailed account of the experiences of participants during data collection. One sample was used in this study, namely, PG students from the Faculty of Health Sciences who were registered in the year 2022. In this chapter, the research design used, the process of data collection, and the tools utilized for collecting data are explored. The sub-sections that follow provide an extensive discussion of the research design, and the method employed for data collection, namely in-depth semi-structured interviews. The sampling process, the characteristics of the recruited samples, as well as the procedures adopted for data collection and analysis, are also covered.

3.2 RESEARCH PARADIGM

A research paradigm has been described as a collective perspective or worldview embraced by a community of researchers, grounded in a common set of assumptions, concepts, values, and practices. (Johnson and Christensen 2014: 79-80). Simply put, it is an approach to thinking and doing research. A qualitative research paradigm was adopted for the study. Qualitative research involves approaching the real world rather than controlled research settings, aiming to understand, describe, and sometimes explain social phenomena by analyzing individual/group experiences, interactions/communications, and relevant documents/traces (Flick 2018: 1-736). According to Denzin and Ryan (2007: 1-640), qualitative research entails purposeful

utilization and gathering of diverse empirical materials, such as case studies, personal experiences, introspection, life stories, interviews, observations, historical records, interactive exchanges, and visual texts; these materials serve to describe both ordinary and challenging moments and meanings within individuals' lives. Kothari (2004: 3) explains that qualitative research is focused on qualitative phenomena, i.e., those associated with or involving aspects of quality or kind.

Qualitative research is suitable to gain insight into the experiences, behaviours and beliefs of people within the context where the experiences take place (Jackson, Drummond and Camara 2007: 21-28; Almalki 2016: 288-296). Creswell (2014: 152) further stated that qualitative research is like an exploration where researchers use it to investigate a topic when they don't know much about the variables and theories involved. According to Castleberry and Nolen (2018: 807-815), qualitative research aims to gain a better understanding of the phenomenon through the experiences of those who have directly experienced the phenomenon, recognizing the value of participants' unique viewpoints that can only be fully understood within the context of their experiences and worldview. Almalki (2016: 288-296) characterized this approach as focusing on gaining a contextual understanding of issues by investigating them within their specific context and emphasizing the significance, purpose, or reality individuals attach to them. According to Castleberry and Nolen (2018: 807-815), a qualitative research approach is valuable because it helps us better understand the meanings that people give to actions, events, and relationships in a more detailed and profound way. For this study, the researcher utilized interviews to explore the knowledge and preparedness of PG students to engage with ethical issues in health research. This afforded the researcher a rich, deeper understanding of the current knowledge of ethics amongst PG students in the Faculty of Health Sciences, and the challenges that are experienced.

Kothari (2004: 31) stated that a research design is a theoretical framework guiding research endeavours; it serves as the blueprint for the collection, measurement, and analysis of data. The research design implemented for this study was exploratory. An exploratory research design is a valuable method for discovering what is happening,

seeking new insights, asking questions, and assessing situations from a fresh perspective (Olawale, Chinagozi and Joe 2023: 1384-1395). According to De Vos *et al.* (2005: 106), exploratory research primarily aims to explore and understand a topic, and researchers often use qualitative data in this process

3.3 RESEARCHER'S ROLE AND REFLEXIVITY

Berger (2015: 2) described reflexivity as "the self-appraisal in research, it means turning off the researcher lens back onto oneself to recognize and take responsibility for one's situatedness within the research." For the researcher, the interest was not only research-oriented, but it also aimed to gain an understanding and awareness that would support the researcher's professional commitments. The researcher is the Administrator of the IREC at the UOT. Interest in this study stemmed from student queries regarding their applications for ethics clearance and their ability to respond to the committee queries. The researcher had to take cognizance of her personal experience with the research ethics process, knowledge of the subject and opinions and put it aside so as not to be biased.

3.4 STUDY SETTING

Silverman (2017: 45) indicated that a research setting refers to the specific physical location where the collection of data occurs. The study setting was the Faculty of Health Sciences, at a UOT. The UOT is a HEI located in KwaZulu-Natal. The University offers a wide range of undergraduate and PG programmes across six faculties. The Faculty of Health Sciences offers PG qualifications in Biomedical and Clinical Technology, Chiropractic, Community Health Studies, Emergency Medical Care and Rescue, Homoeopathy, Nursing, Radiography and Somatology. The faculty registered a total of 2578 students in 2022.

3.5 STUDY POPULATION

A population is defined as a large group, whether objects, events or persons, from which a researcher draws a sample and from which results are generalised (Lawrence Neuman 2014: 252). The population for this study comprised all Health Sciences PG students registered at the University in 2022 spread across nine departments. As indicated in Table 1, the Faculty of Health Sciences registered a total of 320 PG students in 2022.

Table 1: Health Science PG headcount for 2022

DEPARTMENT	MASTERS	DOCTORATE	TOTAL
Biomedical and Clinical Technology	28	3	31
Chiropractic	67	1	68
Community Health Studies	24	3	27
Emergency Medical Care and Rescue	24	4	28
Homoeopathy	40	0	40
Nursing	19	12	31
Radiography	15	5	20
Somatology	7	0	7
Master's and PhD in Health Sciences	20	48	68
Total	**244**	**76**	**320**

3.6 STUDY SAMPLE

A sample is defined as a small set of objects, events or persons which represent the population (Lawrence Neuman 2014: 246). For this study, the population and the sample were the same. All PG students in the Faculty of Health Sciences registered for the year 2022 were invited to partake in the study.

3.7 SAMPLING STRATEGY

There are two types of sampling methods i.e., probability and non-probability sampling methods. According to Lawrence Neuman (2014: 328), non-probability sampling methods

are used for qualitative studies. According to Blair and Blair (2015: 11), non-probability samples are not obtained through a random process; rather, elements are generally chosen based on judgment, quotas, or convenience. For this study, the researcher utilised a non-probability, convenience sampling method to select the sample. Acharya *et al.* (2013: 330-333) described convenience sampling as the most frequently employed sampling method which involves selecting a sample based on the ease and availability of participants, often chosen because they are conveniently present at the right time and place. Convenience sampling, also known as Haphazard Sampling or Accidental Sampling, is a nonprobability sampling method where individuals from the target population who meet practical criteria such as easy accessibility, geographical proximity, availability, or willingness to participate are included in the study (Etikan, Musa and Alkassim 2016: 1-4). Qualitative researchers seek to recruit participants, groups or settings where the specific subject being studied is most likely to occur (Lawrence Neuman 2014: 328). This was to ensure that the participants provided rich and detailed information, related to the objectives of the study. Convenience sampling was utilised for this study as the participants are registered with the Faculty of Health Sciences and conduct Health Science research. For this study, Health Sciences PG students registered in 2022 were recruited for the study. Postgraduate students from all departments were invited to partake in the study. Students who indicated a willingness to participate in the study were recruited. Students from the Departments of Homoeopathy, Somatology and Community Health Studies did not indicate a willingness to participate in the study and hence were excluded. This, however, had no bearing on the data that was collected as the study looked at information richness related to issues related to ethics in Health Science research broadly and not within one disciplinary department.

3.8 SAMPLING PROCESS

A convenience sampling technique was utilised to select the sample for this study as the study sought to interview PG students involved in Health Research at the Faculty of Health Sciences. The total number of PG students registered in 2022 was 320 (244 masters and 76 Doctorate students). Although a cross-section of participants from

different disciplinary departments was obtained, those who came forward first were recruited. Data was generated through informed consent and was guided by data saturation. According to Fusch and Ness (2015: 1408-1416), data saturation is reached when there is enough information to replicate the study, when the ability to obtain additional new information has been attained and when further coding is no longer feasible. The researcher proposed a minimum sample size of 15 participants for this study. Data was collected until saturation was reached.

3.8.1 Inclusion Criteria

It is a standard practice of establishing inclusion and exclusion criteria when designing a research proposal, and it sets the stage for who qualifies to participate in a study. According to Patino and Ferreira (2018: 84), inclusion criteria are outlined as the essential characteristics of the target population that researchers will use to address their research question. The inclusion criteria for this study are:

- Registered PG students in the Faculty of Health Sciences for 2021 or 2022
- PG students of all races and genders.
- PG students from any of the Departments in the Faculty of Health Sciences.

3.8.2 Exclusion Criteria

Exclusion criteria are defined as “features of the potential study participants who meet the inclusion criteria but present with additional characteristics that could interfere with the success of the study or increase their risk for an unfavourable outcome” (Patino and Ferreira 2018: 84). The exclusion criteria for this study are:

- Undergraduate students in the Faculty of Health Sciences.
- PG students from any other Faculty.

3.9 DATA COLLECTION PROCESS

According to Creswell (2014: 185), in qualitative research, “the intent is to explore the general, complex set of factors surrounding the central phenomenon and present the broad, varied perspectives or meanings that participants hold.” For this study, in-depth,

one-on-one semi-structured interviews were used to explore the experiences of research ethics and ethical issues within the context of health sciences. The semi-structured format ranks as the most commonly employed interview technique in qualitative research (Kallio *et al.* 2016: 2954-2965; Bearman 2019: 1-11). According to Lawrence Neuman (2014: 296), semi-structured interviews are used to gain in-depth knowledge, beliefs or perceptions of a particular topic. Adeoye-Olatunde and Olenik (2021: 1358-1367) further stated that semi-structured interviews are the best way to collect information when a researcher wants to get to know an individual's viewpoint instead of just having a general idea about a certain topic. According to Kallio *et al.* (2016: 2954-2965), the semi-structured interview approach is beneficial because it encourages mutual engagement between the interviewer and participant, allowing for improvised follow-up questions based on participant responses.

3.10 TOOL USED

For this study, an interview guide was utilised to collect data (Appendix A). An interview guide has been described as a list of planned questions that could be used as a suitable tool to involve the participant and identify the storytelling aspects. (De Vos et al. 2005: 296). Bearman (2019: 1-11) further described an interview guide as a list of topics and related questions that the interviewer poses to the participant. According to Pedersen *et al.* (2016: 631-638), an interview guide ensures interview consistency and acts as a tool that connects the research problem, research questions, and relevant prior literature. Pedersen *et al.* (2016: 631-638) further mentioned that the interview guide includes a thematic aspect with broad questions linked to the research queries and a dynamic aspect featuring specific questions that foster a natural conversation in the everyday language during the interview. The interview guide employed for this study included a limited number of unstructured and open-ended questions to elicit the views and opinions of the participants regarding research ethics.

3.11 DATA COLLECTION PROCESS

The researcher obtained provisional ethical clearance from the UOT's IREC on 21 October 2020 (Appendix B). A letter requesting permission to conduct research at the institute was then submitted to the Gatekeeper Committee at the UOT. Gatekeeper permission was obtained on 22 October 2020 (Appendix C). Full ethical clearance was issued to the researcher on 13 November 2020 (Appendix D). The process for recruiting participants from the Faculty of Health Sciences was as follows:

- An informal discussion with most PG supervisors in the Faculty of Health Sciences indicated that they have cohort groups and were willing to assist in informing students to participate in the interviews.
- An invite (Appendix E) was sent to all PG supervisors in the Faculty of Health Sciences to distribute to their respective students to participate in the study.
- This strategy was considered most appropriate as the researcher is also the Research Ethics Administrator at the University and hence had direct interaction with PG students, who the researcher had to interact with obviated coercion. The PG supervisors were not requested to recruit students but merely forwarded the invite to participate in the study to their students.
- PG students who were willing to participate had their details forwarded to the researcher via the Supervisor.
- Upon receipt of this information, the researcher contacted the relevant students and confirmed the dates and times for the respective interviews. At this point, the letter of information and consent for completion on the day of the interview (Appendix F) and the MS Teams link to join the interview were sent to the relevant student.
- Data collection for the study was conducted online via MS Teams. Online interviews were recorded with the permission of the participants. Participants were assured that confidentiality would be maintained throughout the study and that their identity would not be divulged at any point of the study or in the dissertation.
- Interviews lasted approximately an hour.

3.12 DATA CAPTURING AND ANALYSIS

Data was collected via interviews held online on MS Teams. Permission was obtained from participants to record these sessions. All participants had granted permission for the interviews to be recorded. After each interview, the recordings were downloaded and stored in a password-protected file. This was done to ensure the confidentiality of participants and to ensure that only the researcher had access to the files. All interviews were conducted in English and transcribed word for word by the researcher.

Thematic analysis, a common method for qualitative data analysis, was used to analyse the data for this study. Johnson and Christensen (2014: 780) defined thematic analysis as recognizing patterns or recurring ideas in the research results. Braun and Clarke (2006: 77-101) described thematic analysis as a technique for discovering, analyzing, and presenting recurring themes in data. Castleberry and Nolen (2018: 807-815) added that thematic analysis is a descriptive method that simplifies the data in a flexible way that works well with other methods of analyzing data. The thematic analysis comprises six main phases (Braun and Clarke 2006: 86). These are discussed below:

Phase one: Familiarising yourself with your data

The first phase involves familiarising oneself with the data. According to Castleberry and Nolen (2018: 807-815), during this phase, the researcher gets a clear understanding of all the data and can better understand how a word or phrase is used when seen in the complete context. The researcher transcribed all interviews and ensured that all responses were captured as per the recording. The data was read several times which allowed the researcher to be immersed in the data, which allowed the researcher to make notes and ideas for coding.

Phase two: Generating the initial codes

According to Braun and Clarke (2006: 88), this phase involved generating initial codes from the data. Coding, as described by Castleberry and Nolen (2018: 807-815) is the

process whereby the raw data are transformed into usable data by identifying themes, concepts, or ideas that are related to each other. The researcher read the interviews in their entirety and got a sense of what the participants were trying to say. Memos/ notes were made in the margins of the transcripts. The researcher highlighted important words in the data and colour-coded similar sections for easy identification. Similar sections were grouped to ensure consistency.

Phase three: Searching for themes

Phase three entailed searching for themes. According to Braun and Clarke (2006: 88), this phase involves organizing the codes into potential themes and gathering all the related coded data excerpts under the identified themes. Riger and Sigurvinsdottir (2016: 35) stated that after coding the data and gathering material that falls under the same codes, the search for themes can begin. Mind maps, tables, charts, and templates are employed to organize themes and codes.

The colour-coded data was further refined into themes and sub-themes to ensure the data was well-organized. The researcher formed a table to categorize the themes and sub-themes, thus establishing a structured arrangement to show their interrelationships.

Phase four: Reviewing the themes

Phase four involved the refinement of themes already developed. According to Riger and Sigurvinsdottir (2016: 35), once themes are identified, the researcher needs to review the information; some potential themes may not be relevant to the research question, while others may be merged into broader concepts or divided into separate themes.

The researcher reviewed the transcripts once again and made necessary changes as some codes overlapped with each other. The researcher looked at the information connected to each theme and considered whether it matched appropriately. Reviewing

the themes helped the researcher assess whether the coded data for those themes made sense and followed a clear pattern.

Phase five: Defining and naming the themes

Phase five involved defining and naming the themes. Riger and Sigurvinsdottir (2016: 35) indicated that in phase five, the crucial task is to identify the main idea within each theme and give it a concise name that captures the idea. The researcher conducted a final refinement of the themes, ensuring they were named in a way that was both clear and precisely matched the data.

Phase six: Producing the report

Lastly, phase six entailed combining the findings to produce a report, which will be justified and supported by relevant literature. The report presented a concise and logically structured account of the data across all themes. The thematic analysis allowed the formulation of themes and sub-themes from the data. The phases of thematic analysis were crucial in reaching the final stage of the writing process. Excerpts from participants were used extensively to narrate a story where the different themes played a role in highlighting the topic.

3.13 TRUSTWORTHINESS:

Connelly (2016: 435-436) described trustworthiness as the level of certainty in data, interpretation, and the methods employed to ensure the study's quality. The four criteria, i.e. credibility, transferability, dependability and conformability, were used to ensure trustworthiness and research rigour.

3.13.1 Credibility

Connelly (2016: 435-436) asserted that the study's credibility, or the trustworthiness of its truth and findings, stands as the most crucial criterion. Research data is noted as credible

when it is accurately reflected and interpreted. For this study, techniques used to ensure the credibility of the data include prolonged engagement with the participants, interviews were voice recorded to ensure accurate capturing of responses and interviews were accurately transcribed using the exact words used by the participants during the interview.

3.13.2 Transferability

According to Connelly (2016: 435-436), transferability, which refers to the usefulness of research findings in different settings, differs from other aspects of research because readers themselves determine the extent to which the findings apply to their situations. To ensure transferability in this study, a detailed description of the study setting, target population, and methodologies were provided. In addition, the researcher was transparent about analysis and trustworthiness.

3.13.3 Dependability

Stenfors, Kajamaa and Bennett (2020: 596-599) described dependability as the degree to which the research could be duplicated under comparable conditions. The researcher provided a detailed report on the processes involved in the study.

3.13.4 Confirmability

Stenfors, Kajamaa and Bennett (2020: 596-599) described confirmability as establishing a clear connection or correlation between the data and the conclusions. Confirmability refers to the accurate reporting of the data as provided by participants. The researchers explain their findings by providing detailed descriptions and using quotes. Interviews were voice recorded so that there was accurate and truthful reporting of the information.

3.14 ETHICAL CONSIDERATIONS

The researcher obtained ethics clearance from the IREC at the UOT. The ethics number for this study was IREC 100/20. Gatekeeper permission was obtained from the Research and PG Support Directorate at the UOT to conduct research at the institute. An

amendment to the originally approved protocol was applied for and granted to accommodate a change in title and methodology. The approval for the amendment is documented in the approval letter (Appendix G).Data collection took place through the form of online semi-structured interviews. The interview schedule was used by the researcher to elicit valuable information from the participants and was checked by the researcher's supervisor.

This study was guided by the four principles of ethics namely autonomy/ respect for others, beneficence, non-maleficence and justice.

3.14.1 Autonomy

Autonomy refers to an individual's right to make informed decisions after being adequately provided with information and time (Tangwa 2009: S2-S7; Artal and Rubenfeld 2017: 107-114). Autonomy was maintained by providing participants with letters of information documents, which provided all relevant information regarding the study.

A detailed letter of information and consent (Annexure F) was sent to participants after they agreed to partake in the study. All relevant information was included in the letter of information, which was written in simple language to ensure it was easy to understand. Once an interview was confirmed, participants signed and returned the consent portion of the document to the researcher. The interview began only after written consent was obtained from the participant. At the start of the interview, participants were given a brief overview of the study, assured that their details would remain anonymous throughout the research process, and informed that they could withdraw at any time. Additionally, they were reminded that the interview would be recorded.

Interview documents were kept confidential by the use of anonymized labels. All research related documents were securely stored on a password protected file on a password protected laptop.

In order to mitigate any power dynamics, a neutral tone was established for the interview. The researcher emphasized that the purpose was to understand participants' challenges and experiences and to gather insights for improving research ethics processes. Participants were assured that their identity and responses would remain confidential. The interviews were conducted online to ensure a neutral and non-intimidating environment, and participants were given the opportunity to ask questions at the end of the interview.

3.14.2 Beneficence

Beneficence refers to the moral obligation to do good, research should have the right impact (Tangwa 2009: S2-S7). The study is relevant to PG students conducting health research studies. The researcher aimed to provide insight into the knowledge and preparedness of PG students conducting research.

In my study, beneficence was upheld through careful consideration of participant recruitment, the design of interview questions, and the potential impact of the research findings. Participants were recruited via an invitation sent by the Supervisor, ensuring there was no undue pressure to participate. This approach safeguarded their autonomy and decision-making.

The interview questions were straightforward and intentionally designed to avoid discomfort. For participants who encountered any difficulty in understanding a question, further clarity was provided to ensure a supportive and stress-free experience.

Furthermore, the findings of the study have the potential to inform and enhance research ethics training and workshops within Health Science research. This contribution stands to benefit both current and future postgraduate students, fostering better preparedness and understanding of ethical issues in research.

3.14.3 Non-maleficence

Non-maleficence involves not causing harm or exposing participants to unnecessary risks (Tangwa 2009: S2-S7). Non-maleficence was assured by not exposing participants to any risk or harm.

Non-maleficence was upheld in my study by ensuring that the exploration of students' experiences with ethical issues in health science research was conducted in a manner that avoided harm or distress. The study aimed to understand their knowledge and preparedness to address ethical issues in Health Science research without critiquing or evaluating their individual ethical decisions, thus maintaining a non-judgmental and supportive approach.

Participants were provided with a safe and supportive environment to share their experiences. Care was taken to avoid delving into sensitive or potentially distressing personal experiences that fell outside the study's scope. Instead, the emphasis was placed on exploring broad themes and insights regarding the ethical challenges they encountered during their research journey.

The study design prioritized participants' privacy by anonymizing their identities and specific experiences. This ensured that any risk of reputational harm or discomfort associated with participation in the study was minimized.

3.14.4 Justice

Justice refers to fairness, human beings should be treated fairly (Tangwa 2009: S2-S7). Participants were treated fairly and were not exposed to any injustices or harm. All relevant clearances were obtained before commencing data collection i.e., faculty approval, ethical clearance and the relevant gatekeeper permissions. Participants were provided with a letter of information, containing all important information regarding the study to make an informed decision to partake. Participants were free to withdraw from

the study at any time. Participants were assured that there were no risks involved with this study and that no harm would come to them by partaking in the study. Participants were treated fairly and equally. Anonymity was ensured by the use of anonymised labels to code the interviews transcripts. Confidentiality in the study was maintained by anonymizing participants' data, securely storing information in password-protected and encrypted files, ensuring that only authorized personnel had access, and reporting findings using anonymized labels to prevent identification of individuals. Data will be stored for 5 years.

3.15 SUMMARY OF THE CHAPTER

Qualitative approaches, with their descriptive nature, enable researchers to create a detailed and complete picture in a real-life setting (Castleberry and Nolen 2018: 807-815). In this chapter, a detailed account of the research process was provided. The researcher interviewed one sample, PG students in the Faculty of Health Sciences. Thematic analysis was used to analyze the data. The following chapter contains the analysis and presentation of the findings.

CHAPTER FOUR: ANALYSIS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

This chapter presents the data collected from PG students registered in the Faculty of Health Sciences at a UOT in eThekwini, for the year 2022. It also presents a discussion of the findings made. The main aim of the study was to explore PG student's experiences related to ethical issues within the context of their research in Health Sciences. The study attempted to understand how students conceptualise research ethics within the context of health sciences research. It sought to explore students' understanding of the various dimensions of research ethics in Health Science research. It also attempted to inquire about their levels of preparedness within their respective disciplines to engage with ethical issues in research and to inquire about their understanding of research misconduct activities. Finally, the emphasis of the study was on providing suggestions for incorporating research ethics into PG programmes in Health Science.

Chapter three included a step-by-step explanation of how data analysis was carried out using thematic analysis. The thematic analysis enabled the researcher to identify and establish themes and sub-themes. This chapter details the demographic data of the study participants, the inter-relationship between the study objectives and the questions in the interview guide, and an introduction to the themes and sub-themes derived from the data that was collected. In addition, an analysis and discussion of the findings will be made.

4.2 DEMOGRAPHIC DATA OF STUDY PARTICIPANTS

Table 2: Demographic data of study participants

PSEUDONYM	GENDER	DEPARTMENT	QUALIFICATION	YEAR OF STUDY
Participant one (P1)	Female	Faculty Office	Generic PhD in Health Sciences	2nd
Participant two (P2)	Female	Nursing	Masters	3rd
Participant three (P3)	Female	Chiropractic	MHSc: Chiropractic	6th
Participant four (P4)	Female	Radiography	MHSc: Radiography	3rd
Participant five (P5)	Male	Radiography	Masters	2nd
Participant six (P6)	Female	Nursing	Masters	2nd
Participant seven (P7)	Female	Radiography	PhD	1st
Participant eight (P8)	Male	Faculty Office	Generic PhD in Health Sciences	2nd
Participant nine (P9)	Female	Faculty Office	Generic PhD in Health Sciences	3rd
Participant ten (P10)	Female	Chiropractic	M Tech: Chiropractic	6th
Participant eleven (P11)	Male	Emergency Medical Care	Masters: Emergency Medical Care	2nd
Participant twelve (P12)	Female	Faculty Office	Generic PhD in Health Sciences	2nd
Participant thirteen (P13)	Female	Clinical Technology	Masters	3rd
Participant fourteen (P14)	Male	Chiropractic	MHSc: Chiropractic	6th
Participant fifteen (P15)	Female	Chiropractic	MHSc: Chiropractic	6th

4.3 RELATIONSHIP BETWEEN OBJECTIVES AND INTERVIEW QUESTIONS

The interview questions were carefully crafted to gather valuable information from the participants, enabling the researcher to align the study's objectives with the interview questions and achieve the study's goals. The questions were open-ended, encouraging participants to provide detailed information and allowing the researcher to explore further during the interviews. Table 3 below displays the relationship between each objective and the interview questions.

Table 3: Objectives and interview questions

OBJECTIVES	INTERVIEW QUESTIONS
1. Understand how students conceptualise ethics within the context of health sciences research.	1. Can you describe how you understand ethics in health science research? 2. Can you share what has been your personal journey with research ethics in Health Science?
2. Explore students' understanding of the various dimensions of ethics in Health Science research.	1. Please share what have been your personal challenges related to research ethics with your study. 2. What do you think are the major ethical issues that challenge students who do health science research e.g. humans; laboratory?
3. Inquire about their levels of preparedness within their disciplines to engage with ethical issues in research.	1. Can you share whether you were prepared to address the ethical issues in your research in your department • Informed consent • Gatekeeper permission • Storage of data • Anonymity and confidentiality
4. Inquire about their understanding of research misconduct activities.	1. Can you describe what you understand by research misconduct? • Plagiarism • Falsifying information • Fabrication of data
5. Make recommendations regarding the integration of research ethics in Health Science PG programmes.	1. What are your views regarding what better supervisory support you can receive regarding research ethics? 2. What are your views regarding a module on research ethics for health sciences research 3. What specific aspects should be covered?

4.4 THE PROCESS OF DATA ANALYSIS

Participants provided informed consent to partake in the study, which included permission for the interviews to be recorded via MS Teams. Interviews with PG students were conducted in English and transcribed by the researcher. Data was analysed using thematic analysis. The process of thematic analysis allowed the researcher to become acquainted with the data which facilitated the extraction of important information. The thematic analysis enabled the identification of both themes and sub-themes. The findings are presented below.

4.5 DATA ANALYSIS AND FINDINGS

The data have been categorized into seven themes and twenty-seven sub-themes which were derived from the participants' responses and are presented in this section. These are detailed in Table 4 below.

Table 4: Themes and sub-themes

THEMES	SUB-THEMES
1. Understanding Research Ethics in Health Sciences	1.1 Students personal conceptualisation of research ethics 1.2 Students' understanding of research ethics within the context of their study 1.3 Research ethics in the context of health research
2. Research Ethics Training	2.1 Inadequate levels of training 2.2 Online research ethics training 2.3 University curriculum 2.4 Self-learning research ethics
3. Challenges with Research Ethics	3.1 Proposal development 3.2 Participant recruitment 3.3 Proposal review (Department Research Committee (DRC), Faculty Research Committee (FRC), Research Ethics Committee (REC) 3.4 Confidentiality 3.5 Gatekeeper permission 3.6 Supervision 3.7 Seamless experience
4. Addressing Ethical Issues in the Proposal	4.1 Letter of Information and Consent 4.2 Gatekeeper permission 4.3 Storage of data 4.4 Anonymity and Confidentiality
5. Supervisory Support	5.1 Good supervisory experience 5.2 Better supervisory support 5.3 Students' perceptions of the role of the supervisor
6. Module for Research Ethics Training	6.1 Support of a module 6.2 Components of a Research Ethics Module
7. Research Misconduct	7.1 Students understanding of research misconduct 7.2 Consequences of research misconduct 7.3 Solutions to prevent misconduct

4.5.1 Theme one: Understanding Research Ethics in Health Sciences

The first theme extracted from the data focused on students' understanding of ethics in health sciences. This overarching first theme comprised three sub-themes, namely, (i) students' conceptualisation of research ethics, (ii) students' understanding of research ethics for their study and (iii) research ethics in the context of health research. The excerpts below reflect the responses of the participants concerning the sub-themes derived from the main theme.

4.5.1.1 Sub-theme one: Students' personal conceptualisation of research ethics

The first sub-theme derived from the data focused on student's conceptualisation of research ethics. Participants shared their understanding of research ethics as follows:

"Ethics is the protection of your participants with minimal risk in a study. So, perform your study with credibility, transparency and trustworthiness." P7

"Ethics ensures that we follow proper guidelines when conducting research and to ensure that the participants are protected." P10

"Research ethics is a very fundamental component of any kind of research that involves people as a centre stage. Ethical principles need to be applied and need to be taken care of, not only in the beginning, but throughout the research process." P12

"Ethics has to do with moral principles. It's basically the moral principles that would govern people's behaviour." P14

"Research ethics would pertain to a protocol or standard. A standard protocol must be put in place to protect the participant and avoid bias. And to also protect the participant's rights." P15

These excerpts reflect students' conceptualisation of research ethics. Ethics has been described by Imran *et al.* (2014: 383-389) as moral principles and standards of behaviour that are acknowledged in human life. According to Samuel and Richie (2023: 428-433), research ethics typically centre on ethical principles that focus on safeguarding the protection, rights, safety, and well-being of individual research participants. Participants provided varied although inter-related descriptions of ethics. They described it as the adherence to proper guidelines or protocols when conducting a research study, with the primary aim of protecting participants. Others described it as upholding ethical standards throughout the research process, in a way that ensures trustworthiness, credibility and transparency. These descriptions resonate with descriptions of how research ethics is conceptualized in the literature. According to Liu *et al.* (2023: 1-11), for example, research ethics makes provision for the ethical standards necessary for conducting research that is both safe and sound. PG Health Science students often involve human participants in their research projects and thus there is the need for a strong grasp of research ethics principles to apply them effectively in their studies. Their narratives reflect a fairly good understanding of research ethics as evidenced in the data.

4.5.1.2 Sub-theme two: Students understanding of research ethics within the context of their study

The second sub-theme derived from the data focused on students' understanding of research ethics within the context of their study. Participants shared their understanding of research ethics within their study as follows:

"I'm doing qualitative research, so for me, my ethics was on trustworthiness and that comprised of my credibility, transferability, and dependability. It was authenticity, and I think confirmability." *P7*

This participant described research ethics in her study as trustworthiness. Trustworthiness plays a crucial role in enhancing the understanding and analysis of research outcomes, enabling individuals to develop a sense of assurance in the quality

of the research (Enworo 2023: 372-384). According to Sharifzadeh (2024: 1-26), trustworthiness has four criteria namely, credibility, confirmability, transferability and dependability. Hence for this participant, research ethics within the context of her study, focused on issues of credibility, transferability and dependability. Addressing these factors in the research proposal ensures the research rigour and trustworthiness of a study.

Another participant said:

"You have a properly written research methodology and you follow the correct channels. It's also helpful to have all these principles as you don't want to take advantage of any participant because they are vulnerable and you want them to be fully informed." P8

Participant 8 expressed that research ethics within the context of her study meant constructing a scientifically sound proposal, which upholds rigor in the process. She further added that research ethics in her study related to the adherence to ethical principles, to ensure that participants were protected. For her, human participants can be considered vulnerable due to multiple circumstances and hence they need to be fully informed with regards to the study. Gordon (2020: 34-38) described being vulnerable as a condition of certain individuals being at higher risk of being exploited in ethically questionable research practices. Spirgienė, Blaževičienė and Santy-Tomlinson (2023: 271-287) further described vulnerable participants as individuals with limited consent capacity or those who are vulnerable due to their health needs. Being ethical as a researcher therefore means ensuring that participants are fully aware of the research process and its risks, before consenting to participate.

Whilst there were positive responses to students' understanding of research ethics within their studies, one particular participant was unsure of whether she addressed research ethics in the research proposal. This reflected a lack of understanding of research ethics, especially since the University's document, encompasses a research ethics checklist. This raised concerns regarding how the student would safeguard research ethics whilst

conducting the study. It is possible that the participant did not have an adequate understanding of research ethics. The participant said:

“I don't remember addressing them when I was doing my research. I think I do have those things.” P5

Research ethics involves implementing rules and guidelines for conducting research (Ajuwon 2020: 11-13). These rules and guidelines must be applied to ensure that research is conducted responsibly. Tarboush *et al.* (2020: 1-8) in a study regarding the understanding of research ethics found that although there was a satisfactory understanding of research ethics, discrepancies persisted in grasping research ethics principles. For PG students, acquiring a solid understanding of research ethics is crucial, as it enables them to comprehend the ethical requirements specific to their studies, address the four ethical principles in their proposals, and ensure the protection of participants throughout the research process. Hence a thorough understanding of research ethics at the interface of their studies was crucial to ensuring that research ethics was upheld rigorously.

4.5.1.3 Sub-theme three: Research ethics in the context of health research

Sub-theme three focused on research ethics within the context of health research. Participants were also asked to describe how they understood research ethics in Health Science research. The following explanations were derived from the data:

“The Nuremberg Code and the Helsinki Declaration are quite specific for health research.” P1

One participant shared that codes and guidelines were put in place to safeguard research participants. This participant understood research ethics in Health Science research as being influenced by the Nuremberg Code and the Declaration of Helsinki. The Nuremberg Code which comprises ten principles, underscores the importance of voluntary consent.

It asserts that experiments should be conducted for the benefit of humans, using scientifically sound methods by qualified professionals (Dhai 2019: 44; Shrestha and Dunn 2019: 548-552). The Declaration of Helsinki further serves as a set of ethical guidelines aimed at the medical community engaged in medical research with human participants (Shrestha and Dunn 2019: 548-552). In understanding the Nuremberg Code and Declaration of Helsinki specific to health research, benefitted the participant by guiding her in conducting ethical research, obtaining informed consent, fostering responsible research practices and supporting her professional development. Hence a thorough understanding of research ethics at the interface of their studies was crucial to ensuring that research ethics were upheld rigorously.

“To care for the patient, to care for the participant to consider them and their emotions and feelings, also to consider their vulnerability and to make sure that the patient is not taken advantage of and that they're properly informed before they can participate in a study.” P8

The above participant’s understanding of research ethics within the context of Health Science research included patient care. Patient care especially for participants who are considered vulnerable is essential. Vulnerable populations are characterized as individuals who are at a heightened risk of experiencing harm or injustice (O’Brien *et al.* 2022: 17-18). Participants who are also patients in one’s research study, are therefore more vulnerable and hence require greater care. Patients in dire need of treatment often view research as their sole hope for addressing their condition, whilst some patients may be susceptible to the "therapeutic misconception," mistakenly perceiving the research as actual therapy (Dhai 2019: 115). Therefore, it is important for researchers to provide detailed information regarding the study and for participants to decide to partake in the research without undue pressure.

“If I’m looking at ethics in Health Science research, then we're talking about human beings which could be adults or children or vulnerable groups, for example, the elderly and people from lower socioeconomic communities. We should ensure that the participant

has access to all the information that they need about their rights, and to confidentiality. In research in Health Sciences, the benefit should always outweigh the risk." P9

The issue of "informed consent" emerged strongly in the data. Informed consent involves providing prospective participants with comprehensive information about the nature of the research, allowing participants ample time to contemplate their decision without coercion or influence, and emphasizing their option to decline participation (Jeyabalan *et al.* 2023: 247). The requirement of fully informing a potential participant of the details of the study is critical. This was further re-iterated by participants 9 and 13.

Disadvantaged communities are those who experience socio-economic problems like unemployment, limited education and income, and inadequate healthcare access. They also encounter other social problems where parents are either very young or where a high level of single parents exist and disabilities (Tully *et al.* 2021: 1-7). These participants can be unfairly exploited. Hence researchers should not take unfair advantage of these individuals by offering rewards for participation and should ensure that proper informed consent is obtained (Dhai 2019: 116). An important issue is that the benefits of their participation in a research study should outweigh the risks of the same. Health Science research encompasses a range of studies including clinical/drug trials, invasive procedures such as blood withdrawals and experimental manipulation of patients and also research involving sensitive personal information (Dhai 2019: 33). This type of research can potentially put participants at risk of physical harm, psychological distress, or in breach of confidentiality. The participant interpreted research ethics within Health Science research, as safeguarding of participants and the prevention of harm to them.

"It comes down to preventing harm and to have a positive outcome for a greater good without having to try and justify the lesser harm." P13

For participant 13, the most important aspect was the prevention of harm to participants, especially the vulnerable. The participants believed that good ethical conduct was predicated on no harm to participants.

Ethical principles serve as essential guides in health research involving human participants, to safeguard their rights and well-being (Than, Htike and Silverman 2020: 379-398). Although participants highlighted several aspects at the interface of health research, there was no mention of possible adverse events during a research study and the offering of aftercare whether medical or psychological to a participant. Complying with research ethics in Health Science research is not only a moral duty but also a requirement for upholding the integrity and credibility of research in this field which will ultimately serve the greater interests of the scientific community and society. A study conducted by Than, Htike and Silverman (2020: 379-398) found that only over one-third of the participants possessed awareness of the specific research ethics guidelines, and just under 80% could correctly identify the particular ethical principles. This leaves much concern during the actual data collection process where the risks to participants are real.

4.5.2 Theme two: Research ethics training

The second theme derived from the data focused on PG students' educational preparedness to deal with research ethics within their studies. Four sub-themes emerged from the data, namely (i) poor levels of training, (ii) online research ethics training and proof of research ethics training requirements. (iii) University curriculum and (iv) self-learning.

4.5.2.1 Sub-theme one: Inadequate levels of training

The first sub-theme derived from the data related to inadequate levels of training amongst the PG students. The excerpts presented below were in response to whether the participants had undertaken research ethics training. The participants said:

“Not so much as a student, no.” P1

“Absolutely no training. No training at all, so literally it's trial and error as I'm going along.” P7

“No, only the first year of my national diploma. Psychodynamics of patient management. I think there was some ethics there, not quite sure. No online training.” P4

“The only guidance I had was from my supervisors and the Department. The only courses that were offered to me were the library courses…writing and endnote. I have missed notifications from the HOD for meetings because if you look on pinboard spam, there's no way for me to go through every single one. Online workshops for PG students are a massive problem as everything is during working hours” P13

According to Knight (2023: 182), when researchers interact with people in their studies, there is a chance it could lead to bad results for those individuals, the researchers themselves, and society as a whole. Thus, when dealing with the research ethics of studying people, it's important to know the rules, be aware of ethical concerns, and have the skills to solve ethical problems (Chen 2003: 112-119). The data revealed a significant gap in research ethics training among PG students in health sciences. Several participants expressed a lack of formal instruction in research ethics throughout their academic journey. What was concerning was that participant 7 highlighted a complete absence of training, relying solely on trial and error in addressing ethical considerations. This suggests that the participant was learning about research through their own experiences and possibly through mistakes made during the research process. This method increases the likelihood of ethical mistakes, including unintentional plagiarism, manipulation of data, or insufficient procedures for obtaining informed consent. These errors have the potential to undermine the credibility and integrity of the research. Assessing and minimizing risk and vulnerability is a crucial aspect of research design and preparation, and adequate research training can assist researchers, particularly graduate students, in addressing these ethical concerns effectively (Knight 2023: 182) .

Participant 4 indicated that the psychodynamics of patient management was covered during the first year of undergraduate study but was unsure of whether research ethics was included. The risk of exposure to research ethics at the undergraduate level is that there is a high likelihood that students could forget these principles by the time they reach

the PG level. Another participant emphasized the absence of online training opportunities, with challenges such as overwhelming notifications and inconvenient timing for workshops, especially for part-time students with full-time jobs. This resonates with a study conducted by Maasdorp and Holtzhausen (2009: 40-55), who found that respondents had expressed concern that their inability to attend many sessions had negatively impacted their knowledge. Learning about research ethics is a crucial component in the academic journey of graduate students, as well as academic and research personnel at Universities and other research establishments (Knight 2023: 182) to adequately prepare them to deal with ethical issues during their PG studies.

4.5.2.2 Sub-theme two: Online research ethics training

The second sub-theme focused on the online research ethics training PG students undertook in preparation for their applications for research ethics clearance. This is captured in the excerpts below:

"The only training I did was an online ethics certification course. The TRREE course…that was done in haste." P2

"I did an online certificate on ethics. It's introduced me to topics that I have forgotten from my masters like the principles that I've mentioned especially beneficence etc." P8

"Yes, I did a TRREE course. I think I did modules one and two." P9

"We had to do an online course which was an introduction to research ethics TRREE." P11

"There were two modules that we had to complete as part of ethics when submitting, so I have done this in my 4th year (TRREE)." P14

These excerpts reflect that the participants had engaged in online research ethics training. Several participants indicated they had completed the online Training and

Resources in Research Ethics Evaluation (TRREE) training. This online training program is a freely accessible web-based training initiative. It consists of five modules covering various aspects of research ethics, including an introduction to research ethics, research ethics evaluation, informed consent, good clinical practice, and the ethics of vaccine trials and public health research. Researchers are issued certificates on successful completion of each module. The completion of this training is mandatory at the University at which the students are registered. According to Makola and Ntoyanto-Tyatyantsi (2023: 208-217), the TRREE training provides basic training in research ethics. It is disconcerting that PG students at the University only have one option for online research ethics training. According to Ogunrin, Ogundiran and Adebamowo (2013: 1-17), a significant channel for facilitating research ethics training is through online courses. The study conducted by Ogunrin, Ogundiran and Adebamowo (2013: 1-17) demonstrated that the online module which is aligned with the Nigerian Code of Health Research Ethics was effective in enhancing an understanding of ethical research conduct amongst participants. Online training not only imparts essential knowledge for research ethics but also offers convenient and flexible learning, allowing students to learn at their own pace. It is possible that the training alerted students to critical issues during their studies.

The data also reflected that the online research ethics training was only undertaken as it was a requirement for research ethics clearance by the research ethics committee, at the institution. This is indicated in the excerpts that follow:

“The requirement for an ethics training certificate to be attached to the proposal, I thought it was kind of overkill because - I naively assumed that a lot of that stuff is just intuitive and people should know, but a lot of people don’t.” P1

“I did the online TRREE last year. I felt like it was not very useful in the sense that at time you just want to get your certificate…. you just want to get your answers instead of understanding what you are doing and what it's about. I felt myself desperately trying to get the certificate by answering the questions than actually trying to understand what it is about.” P7

“For the PhD I did TTREE that was compulsory for us to do and I had to send the certificate to the university.” P9

Most participants specified that undertaking the online research ethics training was prompted by the mandatory requirement of the institution to submit an ethics training certificate along with the proposal for research ethics clearance. It is concerning that participants merely completed the training to meet the requirement for submission to the research ethics committee. As evidenced by participants, the process appears hurried, with students neglecting to invest the necessary time to grasp the concepts of research ethics. Additionally, the training lacks proper guidance, leaving some students perceiving it as an additional burden to the research process. This is disconcerting, as the data suggest that the University might be producing Health Science graduates who don’t have the essential knowledge of research ethics required for health-related research. According to Tang and Lee (2020: 1089-1105), the US National Institutes of Health reported that online instruction lacks adequacy. "Significant face-to-face interaction and discussion among trainees, fellows, scholars, and/or participants" is required to ensure a thorough understanding of research ethics. In addition, a study conducted by Barak and Green (2020: 1403-1421) indicated that online courses centred on individual learning as students often struggle to bridge the divide between understanding ethical principles and effectively applying them in practice. With the increasing emphasis on research ethics in South Africa and globally, the University must introduce a dedicated module that is integrated into the curriculum for PG students. Initiating this module before PGs commence their proposals would prove advantageous, as it ensures that essential ethical considerations are addressed at the proposal stage. This proactive approach can significantly reduce the need for frequent protocol amendments and better prepare students to uphold ethical standards throughout their research endeavours.

4.5.2.3 Sub-theme three: University curriculum

The third sub-theme was drawn from the data centred on the curriculum and the incorporation of research ethics training. The excerpts below shed light on the inclusion of research ethics within the curriculum at the University.

“We did ethics as part of our four-year diploma course. And there was an ethics module when I did the Bachelor’s degree as well.” P2

This participant indicated that they completed an ethics module during their undergraduate year of study. This highlights a significant lack of research ethics training at the PG level which raise concerns as to whether students are ready to address ethical issues in their research. Knight (2023: 182) in his study, highlighted the benefits of research ethics training, which included, giving researchers a chance to think deeply about how they do their research, understand their perspective, think about how they plan their projects, know more about risks and weaknesses, and find ways to reduce those risks. This lack of training has the potential to increase the risk of ethical errors and compromise the credibility of the research. Receiving training solely at the undergraduate level poses the risk of students forgetting crucial aspects of research ethics over time. Moreover, undergraduate years are typically filled with lectures, and if research ethics is not an examinable subject, there is a possibility that students might not prioritize it adequately. This was further re-iterated by participants 3, 10 and 14 in the excerpts that follow. In addition, these participants also indicated that research ethics was part of their research methodology course at the undergraduate level. The integration of research ethics with the research methodology course allows participants to apply ethical principles in their research design and data collection methods, rather than viewing research ethics as a separate concept.

“Yes, it was included as part of our research module. I did my research module at the end of my third year. It was like a month-long module after the examination period where they had to - cram it in and we covered ethics in that module itself.” P3

“I did a module in my fourth year on research and ethics. It covered everything regarding research namely, different types of research, different types of designs and also research ethics. It covered all the aspects of ethics, so the four principles were covered; justice, autonomy, beneficence and nonmaleficence. And it covered everything that's got to do with the ethics.” P10

“So, - you do the research module from your third year up until you graduate. In that module, you have different supervisors or people outside of the institute who come and talk to you about ethics…. But they incorporate it as a whole when you doing research module.” P14

According to Tang and Lee (2020: 1089-1105), a well-organized curriculum on scientific research ethics is crucial to provide researchers with fundamental principles, guiding them in proper conduct within research settings and preparing them to make morally informed and ethically sound decisions when encountering moral dilemmas during the research process. The data indicated that research ethics is not substantively included in the preparedness of PG students. This is particularly disconcerting in light of the growing emphasis on research ethics within university environments and the higher risks of harm in the context of Health Science research. It is essential not only to cultivate graduates who demonstrate ethical responsibility in their professions but also imperative to preserve the institution's reputation and ensure the ethical integrity of all research.

4.5.2.4 Sub-theme four: Self-learning research ethics

The fourth sub-theme derived from the data focused on self-learning. Two participants indicated different types of exposure to training in research ethics. They said as follows:

“I went through some of the literature written by authors and scholars across the world on what research ethics is and how it is applied to a study.” P12

The aforementioned participant indicated engaging in self-learning in research ethics by reading literature on research ethics. The disadvantage of self-learning through literature rather than formal training is the risk of gaps in understanding research ethics due to limited interaction, and insufficient knowledge for applying concepts to real-world situations and addressing ethical challenges. Another participant shared as follows:

“I worked in research for about eight years between 2005 and 2013 at Mayo Clinic, and that was human subject research. At that stage, I had research ethics training there.” P13:

Participant 13 mentioned training which took place during her tenure at another research institute which took place more than ten years ago. Given the huge time lapse, this participant needed to undertake updated research ethics training.

While it is crucial and essential for students to engage in independent reading on research ethics, the University should also ensure that PG students, particularly those in the health sciences, receive comprehensive training in research ethics. In addition, research ethics training should remain current to accommodate the continual emergence of new rules and regulations. Further, such training should adhere to the guidelines set forth by the NHREC in South Africa.

4.5.3 Theme three: Challenges experienced with research ethics

The third theme derived from the data captured the challenges experienced by PG students during their research journey. Seven sub-themes emerged from theme three which are, (i) proposal preparation, (ii) participant recruitment, (iii) proposal review (DRC, FRC, REC), (iv) confidentiality, (v) gatekeeper permission, (vi) supervision and (vii) seamless experience.

4.5.3.1 Sub-theme one: Proposal preparation

The first sub-theme derived from the data related to preparing the proposal for research ethics clearance. The excerpts below link to the sub-theme of challenges experienced during proposal preparation. According to Drolet *et al.* (2023: 269-292), ethical concerns arise at three main points during the research process: (1) when designing the research, (2) during the actual research, and (3) when sharing or communicating the knowledge.

“Where I have found problems is often under methodology where people get very sticky with sampling… things like research paradigm. I don't think that the research paradigm has a lot to do with ethics.” P1

The above excerpt suggests that the student experienced challenges in addressing methodological aspects, particularly sampling and research paradigms. It is assumed that the student encountered challenges with the review committee’s expectations regarding sampling in the proposal. In other words, the section on sampling was not sufficiently addressed in the proposal. Sampling involves selecting a specific number of individuals from a defined group to conduct a research study (Vadakedath and Kandi 2023: 1-12). Further, Andrade (2020: 102-103) indicated that an excessively large sample would inconvenience participants unnecessarily for the study's objectives, which is unethical, while a smaller sample size may lack sufficient statistical power to address the primary research question, potentially leading to statistically non-significant results due to inadequate sample size.

Therefore, the section on sampling in a research proposal is critical; by carefully evaluating the sampling section, research ethics committees can ensure that research is conducted in a manner that upholds ethical standards and protects the welfare of participants. In addition, the participant believed that the research paradigm doesn’t have much to do with research ethics. The research paradigm guides the researcher in various aspects of the investigation, such as choosing the research problem, formulating research questions, determining methodology, and assessing the value of the research work (Khatri 2020: 1435-1440) all of which contribute to the scientific rigour. This raised a red flag; as a research paradigm in a proposal, shapes how the study is conducted, particularly in participant selection or sampling method, in the data collection, analysis and interpretation of the findings. The students' inability to recognise how research paradigms relate to research ethics can lead to missed ethical considerations, methodological inconsistencies, approval challenges, and lower research quality. Both these issues highlighted by the student indicate a need for clearer guidelines by the REC or the university.

“I was not aware of the four principles of ethics…. I didn't know what they meant. The journey was initially confusing and frustrating. Yes, and you needed to get participants, but I didn't know the point where you need to give them an informed consent form. Methodology…honestly, it's only when I came to that chapter and it was back and forth with my co-supervisor.” P4

The aforementioned student did not know the principles of research ethics. The four principles of research ethics, autonomy, justice, beneficence and non-maleficence (Cheraghi *et al.* 2023: 89), guide students and researchers when addressing ethical issues in research proposals. By incorporating these principles into their research proposals, students demonstrate their understanding of ethical considerations and commitment to conducting research responsibly and ethically. The fact that this student did not have this knowledge is a major concern, as students should possess basic knowledge of research ethics before embarking on a research proposal. This knowledge is not only to ensure that ethical principles are upheld in the study but to avoid frustration and the back-and-forth process between the student and supervisor or the student and the review committee that occurs when fundamental issues related to research ethics are not addressed.

This particular student also indicated having little knowledge of when to obtain informed consent from the participant. Informed consent is based on the principle of autonomy, which involves respecting individuals and honouring their dignity (Dhai 2019: 86). Vadakedath and Kandi (2023: 1-12) further defined informed consent as a written agreement indicating that participants have been fully informed about the research procedures, potential risks and benefits, as well as other essential study details such as timing. In such a situation, there is the risk that the student could have commenced data collection without signed informed consent. This is a huge ethical dilemma if the student had not obtained informed consent at the correct point of the study. In such a situation, the student can be guilty of research misconduct and is at risk of losing ethical clearance. This supports earlier arguments for the preparedness of PG students to deal with all aspects of research ethics.

The data also highlighted that the supervisor has a huge role in guiding a student through the research process. It was concerning that participant 7, as narrated below, had to capacitate him/herself through the process, especially in completing the research ethics checklist. The University has included a research ethics checklist in the research proposal which comprises 34 questions covering sections such as deception, confidentiality, recruitment, informed consent, participant risks, benefits, sponsor interests and indemnity, and research in clinical settings. This is a fundamentally important checklist which indicates whether ethical concerns in research have been recognized and dealt with appropriately in the proposal. This in itself ensures that the student is prepared to deal with any ethical dilemmas that may arise and to safeguard the research process. According to Richards (2010: 164-167), working on research ethics can be tough and confusing for both supervisors and those they supervise when they begin their research journey together. However, Richards (2010: 164-167) further indicated that supervisors should also be responsible for guiding students in understanding the requirements of each section in the research ethics form, preventing them from including unnecessary or inappropriate information.

"Ethics checklist: I did find it difficult to do that. I was just trying to read up on other people's dissertations and go through things on the Internet to see which is the best possible answer. There were very minimal guidelines until supervisors looked at it. Neither was I advised so far with my proposal to incorporate the 4 principles." P7

The data for the subtheme on proposal preparation, highlighted the importance of research ethics training to ensure that the PG student is aware that specific information is required especially in the methodology section of a proposal. According to Tarboush *et al.* (2020: 1-8), research ethics is a complex and constantly evolving field and it is therefore essential for researchers to acquaint themselves with fundamental ethical concepts and information. This knowledge is necessary to secure research approval, and publication, and to avoid retractions.

4.5.3.2 Sub-theme two: Participant recruitment

The second sub-theme focused on the challenges experienced during the participant recruitment process. The challenges are captured in the excerpts below:

“Trying to get people to participate is difficult.” P1

Participant 1 experienced difficulties with trying to recruit people to participate. This challenge has a major effect on the progress of the study. Recruitment involves the interaction occurring between a researcher and a potential participant before the initiation of the consent process. It commences with identifying, targeting, and enlisting participants for a research study and the provision of information to potential participants and fostering their interest in the proposed study (Patel, Doku and Tennakoon 2003: 229-238). Difficulty in recruiting and involving patients in research can arise at various stages of the process, including the initial identification and invitation of eligible participants, obtaining their consent, and ensuring active participation during the data collection phase (Price *et al.* 2020: 1-10). A delay in recruitment can impact the timeline of the study which could severely impact the student’s morale. In such cases, the student needs to understand why people are hesitant to participate in the study and to make the necessary changes for the study to continue.

“Students who are stuck on a data collection process and they cannot continue… there might be the temptation to fill out the surveys yourself. For students that may be tempting when you get to the hard part of research, finishing your data collection …or using people in your study that you know don't fully meet the requirements but using it because you feel like it's the easy way out.” P3

Participant 3 shared that PG students could be tempted to complete surveys themselves or recruit participants, who do not meet the criteria for participation to meet the sample size due to challenges with recruiting participants. This highlights an ethical dilemma in research where students facing challenges in data collection, together with the pressure to graduate within minimum time, may be tempted to either fill out surveys themselves or

include participants who do not fully meet the study's requirements, thereby compromising the integrity and validity of their research.

This issue poses a huge ethical dilemma, should the student choose this path, as the data will not be representative of the target sample and places the researcher at risk of misconduct. Research misconduct includes inappropriate behaviours such as fabrication, falsification, and plagiarism (da Silva StiggerI *et al.* 2022: 1-7). This issue highlighted by the participant is unethical behaviour, referred to as fabrication of data. According to Kang and Hwang (2020: 7-10), data fabrication involves creating false data and presenting it as genuine data from a study which often occurs when a researcher invents data to complete a study. Falsification of data is a serious ethical violation that goes against the principles of honesty, transparency and integrity in research, which can lead to disciplinary action and damage to the student's academic and professional reputation.

"Difficult to find the participants to even do your research because as we are doing Health Sciences…. when you have to collect data, you need to go to the patient… then you find the patient is sick. So, you can't talk with that patient because he or she is not well" P5.

The aforementioned participant experienced a challenge with recruiting participants, especially when the participants were ill. Participants who are ill are considered a vulnerable population and must be protected against exploitation. Vulnerable populations include children, pregnant women, military personnel, ethnic minorities, refugees, elderly individuals, terminally ill patients, people with physical or intellectual challenges, and those who are economically or educationally disadvantaged (Langer *et al.* 2021: 1102-1115). Should participants not be able to provide informed consent or partake in the study due to illness, it might limit the sample size and impact the study's statistical power. The supervisor plays a critical role in these situations. There should be a backup plan and adaptable data collection methods to address these issues.

This participant also pointed out, in the excerpt that follows, the difficulty in recruiting participants from the radiography department, especially experienced radiographers who

may be hesitant to join studies. This poses a major challenge in gathering enough participants for the study to be statistically viable. However, it is important to respect the potential participant's autonomy.

Let me talk about the radiography department. Some of the qualified radiographers or those who qualified a long time ago, when you do a topic that will require them to participate in your study, might not want to participate. Those are the things that challenge us when we do research and when we are about to find participants. Because they won't participate in your study. Only a few will participate." P5

Participants also experienced challenges with recruiting vulnerable groups for their research. This is evidenced in the excerpts below. In health research, it is often necessary to include vulnerable groups due to the nature of the study. Recruiting these groups can be challenging due to various factors such as illness, distrust, limited access etc. Supervisors must guide students to make arrangements for such delays. Andrews and Davies (2022: 1-3) stated that enrolling and retaining vulnerable populations in research is frequently below standard due to challenges in reaching, engaging, and safely involving them in the study.

"The one major challenge that I've had is because of the principles, which is because the patient is from a vulnerable group and as a researcher, you are not supposed to approach the patients directly. That was a big challenge because the data collection procedure was slowed down. Patients weren't contacting me quickly." P8

"My topic was COVID-related and the participants were healthcare workers. I would phone participants to do the interview and they would be so traumatized at work; sometimes I would make 5 appointments to interview one participant, and because they were psychologically disturbed, I couldn't push them to participate at the time. This was a dilemma because it was taking me long to collect the data. But I also knew that I could not impose on the rights of these participants." P9

4.5.3.3 Sub-theme three: Proposal review (DRC, FRC, REC)

The third sub-theme derived from the data described the challenges participants experienced in the review of their research proposals. Participants shared their views as follows:

"The checklist I found is quite inconsistent. Sometimes the feedback that you get from people is that students might be a special group, but according to other reviews, students are not a special group. So, there's a bit of inconsistency." P1

This participant shared the inconsistencies she experienced in the review process with the review committee. For this particular student, the issue is related to whether students are considered a special group or not. The research ethics checklist which contains 34 questions and is part of the research proposal contains a section on informed consent. One of the questions in this section queries whether the student must secure special or vulnerable groups. The student experienced inconsistencies in the review reports received. This led to confusion, student frustration and unnecessary delays with proposal approval. A document regarding special/ vulnerable populations should therefore be made available to guide PG students to assist them in addressing critical issues in the research proposal so that the reviewers can ensure that the student has sufficiently addressed the issue.

"I had captured my proposal in English (the letter of information and consent) and it was at FRC. One of the people enquired what happens if participants are not English speaking…. they had a whole debate. I spent the money to get everything translated. I didn't end up using any isiZulu information as participants were professionals in the field and spoke English which the committee was aware of. So, for me, it was an additional expense and then didn't eventually end up using it." P14

A further inconsistency was evidenced in the excerpt above about the translation of critical research documents such as the letter of information. Translating research documents like the information and consent letter and data collection tools is crucial when potential

participants don't fully understand or speak the language used in the protocol or documents (Dhai 2019: 41). Although the participants were professionals in the field and spoke fluent English, the review committee requested that the research documents be translated into the relevant local language. This was a waste of time and resources, as the translated documents were not used during the data collection process.

P13: "The turnaround time is a problem and through the whole ethics process. There's always a time limit for the students to submit. At the DRC level, there's no time limit on waiting for a reply and comments on your proposal."

P15: "It takes a long time to get approval. That was my personal experience with that."

P2: "It was a lot of back and forth and the whole process takes very, very long. There's inadequate direction, they don't stipulate this is what's going to happen after so long. The time constraints as well as just the information that they gave."

Most participants found that the turnaround time for the ethical review process was a major challenge, as evidenced by participants 13, 15 and 2 in the excerpts above. Time is critical for PG students due to the limited time allocated to complete specific qualifications. The prolonged turnaround time for approval posed challenges for PG students in planning and executing their research effectively.

The REC plays a crucial role in university administration and serves the dual purpose of upholding research ethics, standards, and scientific merit, and safeguarding the human rights of participants (Davies 2020: 1-26). According to Brown, Spiro and Quinton (2020: 747-769), researchers frequently perceive the research ethics committee as unsupportive of their research efforts, while research ethics committees note that some research approaches lack clear acknowledgement of ethical implications. The data highlighted the need for a streamlined and transparent process that fosters collaboration between researchers and research ethics committees. In a study conducted by Brindley, Nolte and Nel (2020: 94-103), the majority of participants viewed research ethics processes as a

repetitive and cyclical system with inherent obstacles, barriers, and time pressures which led to the perception of research ethics as a challenge to overcome, separate from the broader post-graduate research journey.

4.5.3.4 Sub-theme four: Confidentiality

The fourth sub-theme derived from the data related to challenges participants experienced with confidentiality. It was narrated as follows:

“Confidentiality is probably one. I don't think everyone suffers from it, but in Health Science, I think we're so used to discussions around cases and interesting things that are going on and our research forms such a fundamental part of the Chiro course. It’s the last thing we have to do before we can move on and it's a massive hurdle to get over. And I do feel like we are prone to discussing cases. However, we do try and keep things as confidential as possible because you know you don't ever want to expose one of your patients. And I do think confidentiality is a little bit of a problem for some people where you discuss things out of turn, maybe with a student in passing and you know unintentionally.” P3

This participant was aware of the importance of confidentiality in Health Science research and the potential risks of discussing research with fellow students in the Department. Confidentiality refers to preventing the disclosure of a participant's private information and identity to anyone other than authorized individuals (Dhai 2019: 102). The participant shared the challenge of balancing academic discussions with maintaining confidentiality, especially since students in the Chiropractic clinic were prone to discussing cases and issues around their research. Discussing cases outside of proper channels poses a risk of breaching patient confidentiality, which could compromise patient privacy and trust. This highlights the need to provide research ethics training and support to assist students in managing ethical challenges related to confidentiality in both their research and clinical activities.

4.5.3.5 Sub-theme five: Gatekeeper permission

The fifth sub-theme derived from the data highlighted the challenges experienced with obtaining gatekeeper permission from the relevant authorities.

"The problem started when I had to obtain permission to conduct the study. It was a long journey because sometimes I was sending emails and then they would tell me they didn't receive them because they are the CEO of the hospital, but I was able to catch the permission but it wasn't easy." P5

"The only challenge I had was getting the gatekeeper permission- I had public and private hospitals. Getting the public hospital permission was pretty straightforward. When it came to the private sector, I had to physically go there. Sometimes they wouldn't respond to emails or they wouldn't take calls. It was just taking far too long." P14

The above excerpts link to the sub-theme of the challenges in obtaining gatekeeper permission for health research, especially in private healthcare facilities. According to Singh and Wassenaar (2016: 42-46), if research is intended to be carried out within an institutional setting rather than in the public domain, it is necessary to seek permission from the authorities responsible for overseeing activities in those institutions. This permission is referred to as gatekeeper permission. Data from both participants 5 and 14 indicated difficulties in obtaining gatekeeper permission from different levels of authority, resulting in delays caused by the hierarchical structure. This resonates with a study conducted by Spacey, Harvey and Casey (2021: 433-450) in which it was found that PG students encounter various challenges when approaching gatekeepers to recruit participants for their studies.

A delay in obtaining gatekeeper permission significantly impacts the progress of a study. It can lead to time constraints especially since PG qualifications have strict timelines. It may pause data collection or delay data collection until permission is obtained. In such cases, the student may have to reconsider aspects of the proposal such as sample size

or data collection methods. This will result in adjustments to the research proposal, which will have to be approved at the various review committees starting from the faculty level and then to the REC. To mitigate delays in obtaining gatekeeper permission, students should be advised to initiate communication early in the research planning phase

4.5.3.6 Sub-theme six: Supervision

Challenges with supervision was the sixth sub-theme derived from the data. The data concerning this is as follows:

“I think supervisors need to be trained. It's clear that they not telling us everything during our interaction with them. As I was doing my proposal, it was just not knowing where to start and what to include. I felt in the beginning, there was no clear direction from my supervisors. I felt like I was in the dark.” P7

This participant shared that they did not receive adequate guidance from the supervisor from the onset of the research process. According to Muthanna and Alduais (2021: 95-113) supervisors have an ethical duty to provide adequate supervision, ensuring the development of their supervisees' knowledge and behaviour. This student felt lost and confused during the proposal preparation stage and thought that the supervisor required training to supervise a PG student. This can be quite a daunting time for a PG student, as most students look towards their supervisors for guidance and support. The proposal preparation is a crucial stage in the research journey and having a bad supervision experience could determine whether the student will proceed with further PG qualifications. This is concerning as supervisors should provide the most important information at the onset to avoid the back and forth-of the document.

Equally concerning was the response from participant 9, in the excerpt that follows. This student felt that there was poor guidance from supervisors on how to follow ethical principles. The supervisor's role includes guiding PG students in research skills, research ethics, and their practical application. (Muthanna and Alduais 2021: 95-113). By not providing this guidance effectively, could lead the student to violate ethical principles,

thereby causing harm to participants, and damage to the integrity of the study resulting in the student facing disciplinary action.

"I think one of the things is that the students don't get proper guidelines on how to follow ethical principles." P9

According to Adedokun and Oyetunde-Joshua (2024: 1-18), PG supervision involves a close academic bond between the supervisor and student, where the supervisor helps the student grow academically. The data derived from the interviews suggest that there is a crucial need for training for supervisors before students can be effectively guided. The success of PG research is significantly influenced by effective supervision (Cekiso *et al.* 2019: 8-25). According to Murараneza, Mtshali and Bvumbwe (2020: 1-8), supervising PG research is a concern worldwide due to various challenges identified by scholars that impact both the process and outcomes. Within the context of the current study, the supervisor plays a salient role in capacitating the student to foresee ethical issues and to deal with them effectively.

4.5.3.7 Sub-theme seven: Seamless experience with the research ethics process

The seventh sub-theme derived from the data related to participants' seamless experience with the research ethics process. This is captured in the narratives that follow:

"I didn't have any ethical boundaries in my study. It was quite simple." P2

"I don't feel like I had too many ethical challenges, my research was survey-based, a quantitative study. So, I just had to go out, collect information from surveys, go home, code it and hand it, in. So, I wasn't dealing with a population that was disadvantaged, disenfranchised or at risk of having ethical concerns." P3

"For me, it wasn't that difficult because we worked hand in hand with my supervisor, so he was also assisting me with everything. And another thing is that when I was doing

undergraduate, we did a proposal so I was familiar with some of the things that were supposed to be in that proposal." P5

"I didn't experience any ethical issues. It was not challenging because I was aware of the guidelines and we also did a module, which explained how we should follow ethical guidelines." P10

Some participants experienced a relatively easy proposal development/research ethics process. Training in research ethics and supervisor support were major factors that contributed to the seamless experience. According to Muthanna and Alduais (2021: 95-113) numerous research supervisors are deeply dedicated to offering top-notch supervision to their supervisees, fully aware of achieving the primary goal of research supervision. Whilst this serves as a positive sign for the University, only a minority of participants navigated the research process without encountering challenges. Enhancing both research ethics training and supervisor support can facilitate smoother experiences for a greater number of students in handling research ethics procedures.

4.5.4 Theme four: Addressing ethical issues in the proposal

The fourth theme derived from the data related to addressing ethical issues in the research proposal. Four sub-themes emerged from theme four, namely (1) letter of information and consent, (ii) gatekeeper permission, (iii) storage of data and (iv) anonymity and confidentiality.

4.5.4.1 Sub-theme one: Letter of Information and Consent

The first sub-theme related to the process of informed consent and the specific template that has to be completed for obtaining informed consent. Participants shared as follows:

"I think one of the difficulties with that is not knowing you can put things into simple language. There are so many different headings…. in my experience, people don't read them. I do think the informed consent is a bit overkill and then also that the second page

of the informed consent where not everything applies, but you've got to leave it in any way." P1

This participant was not aware that the letter of information and consent had to be written in simple language for a participant to understand and make an informed decision. According to Xu *et al.* (2020: 1-11), informed consent is defined as a voluntary decision made with enough information and a clear understanding of both the research being proposed and the consequences of taking part in it. The University has a letter of information and consent template which is compulsory for PG students to use in their proposal preparation to obtain informed consent. This document provides headings for which PG students are required to provide the necessary information about their studies.

These headings include the researcher's details, brief background and purpose of the study, an outline of the procedures, risks or discomforts that may occur, participants right to withdraw from the study, benefits to participation, remuneration, confidentiality, costs of the study, information of research-related injury, storage of data and persons to contact in the event of any problems. The informed consent document must be in simple terms and suitable for participants' comprehension level (South Africa National Department of Health 2015). PG students must know that the letter of information must be written in simple language to ensure participant recruitment. Supervisors play a salient role in ensuring that this part of the ethical process is done effectively. Letters which are written in scientific language will be difficult to understand and will confuse participants. In addition, of concern, was the opinion that the letter of information and consent was an "overkill." This specific document is critical when recruiting participants, as it has to contain all relevant information regarding the study including what is required of the participant. There is the risk of taking away a participant's autonomy by not providing all relevant information to the participant.

This is in contrast to the responses from participant 8, as per the excerpt below. Participants were aware that the document had to be written proficiently for their participants to understand.

"Informed consent: I was aware of making the language simpler for the participant to be able to understand clearly and to be properly informed about the research before deciding to volunteer themselves." P8

"Yes, I was aware because we did research when I was an undergraduate. So, everything that we did there, it's assisted me very well when I'm doing my steps." P5

One participant indicated that they were well informed regarding the requirement for informed consent as research was done at the undergraduate level which prepared the student for PG research. This coheres with findings from a study conducted by Maasdorp and Holtzhausen (2009: 40-55) where it was found that addressing current challenges in PG research can be achieved through better preparation of undergraduates for PG studies. However, other PG students were not aware of the requirement of informed consent as stipulated by participants 2 and 14 in the excerpts below. PG students must have all relevant information before commencing their proposal preparation.

"I didn't know that we had to put in all that information. So, I looked at previous Masters Dissertations and I used that to guide me." P2

"No, I didn't completely know all of that information before doing it…. I did know that there was a template. In terms of the translation, I had an idea that we had to translate certain things that knowledge wasn't fully there before me doing it here." P14

The informed consent document and the process of obtaining informed consent mustn't be merely processed to meet ethical requirements. According to Wagoro and Bhatt (2012: 45-50), informed consent safeguards against human participant abuse and upholds respect for individual autonomy. Informed consent relies on the disclosure of relevant information, the ability to provide consent, and a voluntary decision (O'Sullivan *et al.* 2021: 1-15). Informed consent is a crucial aspect of the research process, ensuring that participants understand the study's purpose, procedures, risks, and benefits before agreeing to participate. Providing participants with an easily understandable information

document is essential to facilitate informed decision-making. Some participants from the study did not fully understand the informed consent process. This lack of understanding may have implications beyond just the participants' comprehension. It could lead to delays and frustrations in obtaining approval from research ethics committees, as researchers may need to revise and resubmit documents multiple times to address concerns raised about the informed consent process. These delays can negatively impact the overall progress of the study and contribute to student frustration and disinterest in the research journey.

4.5.4.2 Sub-theme two: Gatekeeper permission

Gatekeeper permission was the second theme that emerged from the data which focused on addressing research ethics issues in the proposal. One participant said:

"I found it quite simple. I think the template is quite user-friendly. And makes a lot more sense to me personally." P1:

Participant 1 found the process of addressing the issue of gatekeeper permission in the proposal to be easy. A gatekeeper has been defined by Singh and Wassenaar (2016: 42-46), as an individual who manages access to an institution or organization, such as a school principal, managing director, or administrator. The University has a pre-determined template for requesting gatekeeper permission which PGs use to complete the necessary information for their respective studies for inclusion in the proposal. Having a template ensures that the student includes important information that the gatekeeper requires in order to make an informed decision when granting permission.

"Yes, I do know because you cannot even attempt to write to gatekeepers when you haven't received permission or acceptance of your research proposal by the university." P6

One participant was aware that researchers can only apply for gatekeeper permission upon obtaining research ethics clearance. This is in contrast to the responses as found in the excerpts below:

P2: "Gatekeeper permission: I did not know who the gatekeeper was. The supervisor guided me a lot with that. As I said, there was no clear direction or communication from the institute stating that this is the process."

The aforementioned participant did not know who the gatekeeper was and was guided by the supervisor. However, this was concerning as students are aware of who their participants will be in their respective studies and at the PG level should have some idea of who the relevant gatekeepers will be.

P15: "That was one aspect I don't think we were prepared for… I felt zero prepared. I didn't know who my gatekeeper was, but in my case, it was a bit different because my supervisor was the HOD, so I couldn't go that route. I have to go to the Dean. So no, I didn't know."

As evidenced in the above narrative, the participant expressed being ill-prepared to address the issue of gatekeeper permission. This particular student required institutional permission to commence data collection, but only the Dean was mentioned. This was concerning as the proposal would have been sent back for correction which would have resulted in delays in obtaining ethical clearance.

P8: "I was advised by the Department of Health that they don't need to permit me because it's a public clinic and the municipality gatekeeper permission was sufficient. So, then we had to adjust the proposal and then we had to resubmit to FRC and then to the ethics committee for amendment…There were delays."

The aforementioned student needed to revise the proposal, because of an unnecessary request for gatekeeper permission. As a result, the proposal had to undergo a second

round of review and approval by the faculty, which then had to be resubmitted to the research ethics committee. This resulted in unnecessary delays for the student, the faculty and the REC should have been aware of this requirement for gatekeeper permission.

It is imperative that research ethics training include the importance of gatekeeper permission and guidelines for students on how to obtain the necessary permission/s. It will also be useful if the University's research ethics guidelines include the various Health Departments in the country and details of the relevant person to contact to obtain gatekeeper permission for the respective institution. Obtaining gatekeeper permission can delay a student by months, which could lead to student demotivation and lack of interest in the research.

4.5.4.3 Sub-theme three: Storage of data

The third sub-theme which emerged from the data dealt with the storage of data. Participants were questioned as to whether they knew data storage requirements. They shared as follows:

"I know that it needs to be stored for five years." P5

"Yes, we were told in general that it's stored for five years and then destroyed." P15

Most participants, as indicated by the excerpts above, were aware of the number of years required for the storage of data. This may be because the research ethics checklist requires students to indicate the mandatory period for data storage. According to Dhai (2019: 50), research records and data must be kept for safety purposes and audit and inspection after the study is finished. Dhai (2019: 51) further indicated that the South African Department of Health guidelines suggest retaining records for 5-15 years, with a minimum of 5 years and compliance with institutional requirements. The REC at the University has included this information in the Standard Operating Procedures which is readily available to students via the University webpage. However, one participant as

evidenced in the excerpt below, felt that the University should provide guidelines for storage of data. This suggests that the student may not have been aware of the existing document or did not read the necessary information. This will result in the student not addressing the issue of data storage correctly in the proposal, as evidenced by participant 6 below. This leads to the unnecessary return of the research proposal by the review committee, for a critical issue that was not addressed in the proposal due to a lack of knowledge regarding the same.

"Yes, although I do feel that what would be helpful there if the institute had somewhere in the ethics guidelines, what exactly they expect people to do with storage of their data so that people know what the requirement is at that time." P1

"My proposal was sent back to correct it on the storage." P6

"I will be honest, what is actually in my dissertation on what happened, is not the same. In my dissertation, I said that the information would be stored on a computer for five years and I'll only have access to it and my supervisor. Meanwhile, the data is with me. It's in a book. It's not even on a computer." P4

The aforementioned participant's admission of not following data storage procedures as per the approved proposal was very disconcerting. The risk of not following proper procedure is that data can be accessible by anyone, which can put the participant at risk should there be any identifiable information in the data. This was a risk to both the PG student and the participant and could place the University in disrepute.

4.5.4.4 Sub-theme four: Anonymity and Confidentiality

Anonymity and confidentiality were the fourth sub-theme derived from the data. Participants expressed their views related to this sub-theme as follows:

“I still think I think there could be better guidance about that, particularly where people are trying to do surveys. The informed consent document is going to have a name, but now your survey is supposed to be anonymous.” P1

“That was quite easy to maintain as well, my surveys didn't have any names attached to them. That was only on the informed consent that was signed.” P3

“Yes, I was because I felt that every target population is entitled to their viewpoints and I needed to respect that whatever they told me, they told me out of confidence, so it would be wrong of me to divulge this information. So, I was willing to abide by the respect for autonomy.” P4:

“My blinding on the program that I use is such that you can either see the respondent's email address, but you don't have names. You can't see the corresponding question sheet code number, so you can't connect that email address to a specific answer list.” P13

“Yes, we were told that we have to keep the documents sealed in an envelope. No one has access to that as well as when we transcribe and things that they've got to have codes.” P15

Most PG students demonstrated awareness and understanding of participant anonymity and confidentiality. However, one participant pointed out the need for clearer guidance particularly when informed consent involves disclosing names while the survey aims to be anonymous. According to Moriña (2021: 1559-1565) ensuring the confidentiality of participants is a responsibility for researchers. It is imperative to reassure participants that any sensitive, personal, or problematic information they share will be held in confidence, and the source of such information will not be disclosed. Moriña (2021: 1559-1565) further explained that maintaining the anonymity of respondents and ensuring a degree of protection or privacy, commonly accomplished by employing pseudonyms, modifying institution names, and incorporating imaginary elements, is a standard research practice.

4.5.5 Theme five: Supervisory support

The fifth theme derived from the data related to supervisory support. Three sub-themes emerged from the data relating to the PG students' respective supervisory experience during their research journey. The themes were as follows (i) good supervisory experience, (ii) better supervisory support and (iii) students' perceptions of the role of the supervisor.

4.5.5.1 Sub-theme one: Good supervisory experience

The first sub-theme emerging from the data regarding supervision was good supervisory experience. Participants shared as follows:

"My supervisors have been quite good." P1

"I think the supervisor, as I said, she was amazing." P2
"I have an amazing supervisor for my study, who guided me a lot, but I would say maybe just including a little bit more of a thorough explanation behind research-specific ethics." P3

"I have a pretty good supervisor. The responses are phenomenal. She's available all the time……she communicates quite well, so I haven't had issues with the supervisor, but I would say that's one thing that could have potentially helped me in my writing." P15

Most of the participants reported positive supervisor interactions during their research journey. The supervisors were praised for their accessibility, guidance, attention to ethical considerations, clear communication, and overall satisfaction. Supervising PGs involves applying academic and interpersonal skills, guiding students through tasks like developing sound proposals, making methodological choices, documenting and publishing research, nurturing both supportive and professional relationships, and facilitating reflection on the research process (Cekiso *et al.* 2019: 8-25). According to Chugh, Macht and Harreveld (2022: 683-697), studies carried out in Australia, Malaysia,

the Netherlands, and the United States consistently demonstrate that the quality of feedback from supervisors significantly impacts student satisfaction, especially in the context of research students. A study conducted by Makola and Ntoyanto-Tyatyantsi (2023: 208-217) has indicated that supervisory support played a crucial role in shaping the PG students' experience with research ethics and the overall research process.

4.5.5.2 Sub-theme two: Better supervisory support

The second sub-theme identified from the data was better supervisory support. This is found in the excerpt below:

“I think the communication with how everything is going to happen, how the entire dissertation will be set it's quite fragmented. At the end of my 2 and 1/2 years, I was sent a template on how the dissertation should be set out. If that is sent at the beginning of the course, it just gives people an idea of what to expect.” P2

The aforementioned participant was disillusioned with the supervision process. Research supervision is to assist students in cultivating critical and creative thinking, refining their research skills, and making meaningful contributions to the existing knowledge base Muthanna and Alduais (2021: 95-113). In this particular case, there was a lack of communication between the participant and the supervisor, particularly regarding the layout of the final dissertation. It was only toward the end of the study that the participant was advised of the particular layout of the dissertation. The supervisor should have provided this information at the onset of the research to prevent any delays and frustration of having to go back and re-format the dissertation and include any missing information; especially when a student is under the impression that the study was complete.

“It's so impersonal. I'm sorry to say, it's just paper going up and down, comments and comments and you respond…maybe more than twice. It shows that this is not right and you can only get it right when you schedule (a meeting).” P6

One participant expressed disappointment in the supervision process. The participant indicated that supervision via email was not sufficient and face-to-face interaction was required to progress. In-person meetings between supervisors and PG students are vital to iron out any issues the student may be experiencing and for the student to also gain a better understanding of what is required.

"I think that I need a little more support than what I have gotten for mine." P11

The aforementioned participant indicated more support was required during the research process. It is concerning when a student does not receive the required support from a supervisor, as it has the potential to cause delays in the approval of the research. It also has the potential to lead to a negative research experience for the student.

"I think a lot of it comes back to feedback and delays in feedback and being told, well, let's submit it and see what they come back with. I think that's a waste of the DRC's time. It points out that some of the senior faculty don't necessarily know more than what I do. It's very frustrating for a student. It did not embed a lot of trust. The whole process was frustrating." P13:

One student as evidenced above, had a challenging process with one of the supervisors who felt that the proposal should be submitted for review without being rigorously scrutinized. This attitude and lack of commitment to ensuring that the proposal was academically and methodologically rigorous suggests either a lack of commitment or knowledge. This inevitably delays the student and does not capacitate the student adequately to develop a robust proposal. Students who have these experiences at Master's level are then compromised in terms of learning and preparation for their Doctoral studies. Appropriate feedback from the supervisor is essential to ensure that the proposal study is approved by the review committee. However, according to Chugh, Macht and Harreveld (2022: 683-697), supervisors often struggle to provide effective feedback to PG research students, with inadequate feedback resulting in a negative supervisory experience for these students. This participant felt that the supervisor did not

have adequate knowledge of research ethics to provide the necessary guidance with drafting the research proposal and relied on the review committee's feedback to align the proposal to ethical principles. This situation is very disconcerting. The University must build the capacity of supervisors for the important task of supervising and guiding PG students through the research process.

Addressing student dissatisfaction with the supervision process is crucial for ensuring the success and well-being of PG researchers. One step that the University can take is to review and update the student-supervisor contract signed at the beginning of the research process. Updating this contract could offer solutions to address students' concerns, such as including provisions for example a minimum of four face-to-face supervision sessions per year. Additionally, incorporating alternative options like supervision sessions via platforms such as MS Teams, which can be recorded for reference, can enhance accessibility and accountability in the supervision process. This revision would ensure clearer expectations and more effective support for students throughout their research journey ultimately enhancing the quality of research outcomes and the overall experience for students. A study conducted by Cekiso *et al.* (2019: 8-25) revealed a lack of communication in the student-supervisor relationship, and inadequate and delayed feedback, causing students distress. Insufficient feedback has the potential to generate tension in the supervisor-student relationship and hinder both learning and achievement (Chugh, Macht and Harreveld 2022: 683-697). Additionally, Muraraneza, Mtshali and Bvumbwe (2020: 1-8) indicated that inadequate research supervision and insufficient feedback and support provided to PG students can result in delays or non-completion of studies.

4.5.5.3 Sub-theme three: Students' perceptions of the role of the supervisor

The third sub-theme derived from the data related to students' perceptions of the role of the supervisor. They shared as follows:

“I would think if my supervisors stress the importance of ethics, what is expected if it's a qualitative or a quantitative study, from an ethical point of view, what are you expected to know? What are you expected to include?” P7

Participant 7 indicated that supervisors should highlight the importance of research ethics and the aspects to be included in the research proposal. It is therefore crucial for supervisors to highlight the importance of research ethics and to provide sufficient guidance to the PG to ensure that all ethical principles are addressed in the proposal and that the student is not at risk of research misconduct.

“If you're a supervisor, then you should be a good role model to that student because when it comes to research ethics, it's not just about what's only in the textbook but about when you the research.” P9

The aforementioned participant indicated that the supervisor should also be a good role model. Supervisors set the tone for ethical conduct in research and through their demonstration of ethical behaviour, PG students are inspired to uphold ethical standards throughout the research process.

“Maybe a session with the students on just the ethics part and focusing on maybe individually on students and what they may face in their research. Sometimes I think it just needs to be focused on the actual individual and what they're doing specifically.” P11

The aforementioned student indicated that supervisors should conduct some research ethics training for the PG students that they supervise. In addition, individual supervision sessions with their respective students are expected.

“So, what I would like is probably a little bit out-of-the-box, but a template stating with each chapter the idea behind what you're doing and what you're writing. So, let's say the introduction, explain your topic, and explain X, Y and Z, the literature review, the literature on X, Y and Z. So as a guideline so to speak.” P15

As evidenced, participant 15 required the supervisor to guide the layout of the dissertation/ thesis. It is assumed that the University does have a template for the layout of the final write-up and it is concerning that this is not shared with PG students during supervision.

4.5.6 Theme six: Module for research ethics training

The sixth theme that surfaced from the data pertained to the creation of a module for ethics training. Two sub-themes were derived from the information namely (i) support of a module and (ii) components of a research ethics module.

4.5.6.1 Sub-theme one: Support of a module

The first sub-theme derived from the data related to the participants being in support of a research ethics module. According to Liu *et al.* (2023: 1-11), developing a proper knowledge of research ethics is critical for PGs as it provides the ethical standards for conducting sound and safe research. Students who supported a module on research ethics stated the following:

"I would support that. I just think that a module like that would be really useful if it was done well and it's something that I looked for. Try to get the students passionate about ethics instead of them looking at it just as a stumbling block." P1

"Yes. I think it would benefit people because when we did ethics in our 4-year diploma course, it was the most boring part of the training. But as you progress in your career, you realize just how important it is. And I think having it would be highly beneficial." P2

"I think it would be fundamentally important. It is scattered throughout our course, but I think a comprehensive module on ethics would be amazing." P3

"I think it would be a very good thing. You know, we are facing a situation of moral decay in our profession. Yes, we are writing it in the books, but practically it's not there." P6

"It definitely should be a module for every student that does their masters" P10

According to Chen (2003: 112-119), it is important to start teaching research ethics early and include it throughout the entire research training period. The PG students overwhelmingly expressed support for the implementation of a research ethics module. Participants recognized the importance of such a module in enhancing their understanding of ethical principles and guidelines, not only for research purposes but also for their future professional careers. The consensus was that a dedicated research ethics module should be a compulsory component for all health science courses, offered at multiple stages of academic progression, including undergraduate and PG levels.

These responses align with the findings of a study conducted by Liu *et al.* (2023: 1-11), where nearly 94.4% of the participants shared the belief that a research ethics course should be compulsory. Than, Htike and Silverman (2020: 379-398) further found that more than 90% of PG students agreed that incorporating research ethics as a mandatory module at the PG level was crucial, underscoring the importance of providing research ethics training to all. In addition, Tang and Lee (2020: 1089-1105) stated that a formal course on research ethics was essential to offer guiding principles for young researchers, enabling them to conduct themselves appropriately in academic and social research settings and make ethically sound decisions when facing moral dilemmas in research. The positive responses regarding a research ethics module indicate students' willingness to learn about research ethics. It is assumed that most students battle with the research process due to the minimal exposure to research ethics at relevant points of their academic journey. The introduction of a research ethics module should be fast-tracked by the University. It is important for the University to create enthusiasm regarding research ethics and not for students to just perceive the subject as a mere obstacle in their research journey.

4.5.6.2 Sub-theme two: Components of a Research Ethics Module

The second sub-theme derived from the data related to participants' opinions regarding possible components of a research ethics module at the University. They said:

"What makes Health Sciences research special… why is it different and why is it so important? Go back into the history… informed consent. The importance of confidentiality and when confidentiality hasn't been maintained. Research misconduct, data storage…anonymity." P1

"The importance of ethics and research misconduct as well as the four principles and the processes of getting a consent form and the gatekeeper permission." P5

"The ethics checklist was subcategorized, for example, with confidentiality and there were questions on informed consent. I think a more in-depth understanding of each of the subdivisions that ethics entails, will be useful." P7

"What are the processes that have to be done to get full gatekeeper permission? Misconduct I think, is the most important thing. Coercion is necessary. History of ethics must be included." P14

"Bias - explain the repercussions of having bias, repercussions of not informing your participant about what can happen. And if you don't inform them, how it can be a legal case? Coercion…it would be nice if they explained the principles." P15

Most participants supported that a well-structured, comprehensive, and mandatory research ethics module was essential for PG students in Health Sciences. In research ethics education, if we aim to enhance PG students' ethical decision-making, the curriculum should focus on providing information and steps to help them make better ethical choices, rather than just stressing the importance of following rules and guidelines (Torrence et al. 2017: 269-296). It is positive that students have identified specific areas for research ethics training, indicating a recognition of the importance of research ethics. However, the data reveals the absence of an in-depth research ethics module for PG students which highlights a significant gap in the University's curriculum. Considering the increasing relevance of research ethics, particularly in health research involving human participants, the University must prioritize the development of such a module as a short-

term plan. Doing so will better prepare PG students for their research journey while ensuring ethical standards are upheld in their work

4.5.7 Theme Seven: Research misconduct

The seventh theme was derived from data related to research misconduct. Three sub-themes surfaced from this main theme namely, (i) students understanding of research misconduct, (ii) consequences of research misconduct and (iii) solutions to prevent misconduct.

4.5.7.1 Sub-theme one: Students' understanding of research misconduct

The first sub-theme derived from the data was students' understanding of research misconduct. Research misconduct has been defined as engaging in "fabrication, falsification, or plagiarism" during the proposal, execution, or review of research, as well as in the reporting of research results (Redman and Caplan 2021: 37-41). The students shared their understanding of research misconduct as follows:

"So, research misconduct would be not obtaining consent, not keeping the individuals' names out of the study….. copying someone else's work." P2

"Anything that's going to compromise the ethics and compromise the integrity of the study itself and potentially harm participants, whether that's just personal information or physically harming participants. P3

"It's when you will expose the names of the participants as well as not maybe reference your studies….. plagiarism as well." P5

"Research misconduct… when you transgress any of the principles of ethics, breach the principle of confidentiality, stealing other people's work and making it your own. Creating your ghost participant." P6

"Research misconduct for example, if you are biased, in how you choose your participant, if you give fraudulent information, when you skew the research findings to match the outcome that you want, and bribery to get participants. Causing injury to your participant, exposing your participant to other people in the surrounding area." P9

Students' opinions on research misconduct encompassed various aspects, including plagiarism, failure to obtain consent, compromising the integrity of the study, and potential harm to participants. Misconduct was viewed as a violation of ethical principles. The consensus was that research misconduct involved actions that undermined the ethical foundations of research, ranging from not adhering to protocols and procedures to manipulating data and breaching participants' rights. According to Yeo-Teh and Tang (2021: 55-65) despite the broad understanding of research misconduct, indicated by a significant knowledge level about these acts, people sometimes succumb to moral lapses.

Having clear and concise guidelines on research misconduct is crucial for universities to uphold ethical standards and maintain credibility. PG students especially, may face temptations to fabricate data or be dishonest with participants, which can have severe consequences for both their reputation and the university's credibility. Misconduct not only wastes research resources, including hard-to-obtain funding, but it can also harm participants and potentially lead to legal repercussions. Therefore, the University must have robust policies and guidelines in place to prevent and address research misconduct effectively. One proactive measure could be that PG students are required to sign a misconduct agreement at the outset of the research process. This agreement would serve as a formal acknowledgement of the consequences of misconduct and reinforce the importance of upholding ethical standards throughout the research process. By implementing clear policies, providing comprehensive training on research ethics, and holding individuals accountable for their actions, universities can mitigate the risks associated with research misconduct and uphold the integrity of academic research.

4.5.7.2 Sub-theme two: Consequences of research misconduct

The second sub-theme derived from the data related to the consequences of research misconduct. Participants were requested to state what they believed to be the consequences of research misconduct at the University. They shared as follows:

"The researcher might be at risk or is at risk of facing a disciplinary committee. They're also at risk of the research being suspended and being expelled from the university." P8

"You can also suspend academic training for a short period…there should also be some like corrective measures where you can perhaps get the student to work closely with somebody who's going to develop them in research." P9

"The University needs to take a very strict stand. Such a student needs to be stricken of that program because if this student goes on to be a health practitioner in his career, what kind of conduct will he or she do in his professional life." P12

"So, from my understanding currently they have to go for a tribunal. The worst-case scenario is that they get banned from the institution and from practicing that field again. I think that's an outcome." P14

Most participants were aware of the severe consequences associated with research misconduct. Participants emphasized that failure to adhere to protocols, procedures, and regulations posed significant risks, including facing a disciplinary committee, potential withdrawal of research ethics clearance, and suspension of the study. These findings corroborate the findings of the study conducted by da Silva StiggerI *et al.* (2022: 1-7) where it was found that PG students possess a comprehensive understanding of the seriousness of inappropriate behaviour in scientific research and the adverse consequences it can have. These findings and that of the current study then reflect that students may be aware of the need to maintain good ethical conduct.

4.5.7.3 Sub-theme three: Solutions to prevent misconduct

The third sub-theme identified from the data pertained to solutions to prevent misconduct. They said as follows:

"So having a supervisor and more research-related modules. This could potentially help and guide the student to follow the correct procedures and protocols. Supervisors should be more involved." P8

"I think that this could be included as a module in the curriculum." P9

"The ethics boards have to play a major role in this because even in my proposal a lot of iterations happened and, in the end, many weaknesses were rectified during the proposal approval process. Also, the role of supervisor." P12

Participants indicated that guidance and support from the supervisor, research ethics training and the REC play a crucial role in preventing research misconduct. These findings corroborate the findings of Tarboush *et al.* (2020: 1-8) who concluded that mandatory research ethics training, along with continuous evaluation, should be available to all researchers at both undergraduate and PG levels. Furthermore, it is crucial to implement institutional regulations and oversight for research projects to prevent misconduct. Ensuring the prevention of research misconduct is crucial to upholding the integrity and credibility of scientific research. The University must include a module on research misconduct as part of research ethics training. Equally important is the inclusion of research integrity as part of the module. The inclusion of research integrity within the training module will not only assist PG students build good academic and professional reputations but will enhance their personal and professional growth which will ensure that the research they conduct is trustworthy and reliable. In addition, Faculty and the REC need to have an oversight process of all approved research being conducted at the University. Annual progress reports must be compulsory.

4.6 CONCLUSION

Chapter Five presented the data and provided a critical analysis of the study's findings. Seven themes and twenty-six sub-themes were identified, all relating to PG students' conceptualization of research ethics for Health Science research. The data explored students' understanding of research ethics in health research, research ethics training, challenges with research ethics, supervisory support, research misconduct, and the need for a research ethics module at the UOT. The following chapter presents the conclusions and recommendations.

CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The focus of the current study was to explore PG students' understanding of research ethics and their experiences of ethical issues within the context of Health Sciences. The objectives of the study were to (1) understand how students conceptualise research ethics within the context of Health Sciences research, (2) explore students understanding of the various dimensions of research ethics in Health Science research, (3) inquire about their levels of preparedness within their disciplines to engage with ethical issues in research, (4) inquire about their understanding of research misconduct activities and (5) make recommendations regarding the integration of research ethics in Health Science PG programmes.

Data presented in Chapter Four revealed the emergence of seven primary themes and twenty-six sub-themes during the analysis phase. Data from participants were gathered through the use of semi-structured interviews. The study focused on a single sample of Health Sciences PG students registered at the specific UOT for the year 2022.

5.2 MAJOR FINDINGS

The table that follows outlines the seven primary themes derived from the data. These emerged from the semi-structured interviews as outlined:

Table 5: Major findings

THEMES	SUB-THEMES
1. Understanding Research Ethics in Health Sciences	1.1 Students personal conceptualisation of research ethics 1.2 Students understanding of research ethics within the context of their study 1.3 Research ethics in the context of health research
2. Research Ethics Training	2.1 Inadequate levels of training 2.2 Online research ethics training 2.3 University curriculum 2.4 Self-learning research ethics
3. Challenges with Research Ethics	3.1 Proposal development 3.2 Participant recruitment 3.3 Proposal review (DRC, FRC, REC) 3.4 Confidentiality 3.5 Gatekeeper permission 3.6 Supervision 3.7 Seamless experience
4. Addressing Ethical Issues in the Proposal	4.1 Letter of Information and Consent 4.2 Gatekeeper permission 4.3 Storage of data 4.4 Anonymity and Confidentiality
5. Supervisory Support	5.1 Good supervisory experience 5.2 Better supervisory support 5.3 Students' perceptions of the role of the supervisor
6. Module for Research Ethics Training	6.1 Support of a module 6.2 Components of a research ethics module
7. Research Misconduct	7.1 Students understanding of research misconduct 7.2 Consequences of research misconduct 7.3 Solutions to prevent misconduct

The following discussion presents the key findings concerning the objectives of the study.

5.2.1 PG students' conceptualization of ethics within the context of Health Sciences research

The first objective of the study was to explore how students conceptualise research ethics within the context of Health Science research. The findings revealed that students understand research ethics with several key principles that include following protocols, protecting participants, ensuring trustworthiness and credibility, maintaining transparency, prioritizing patient care, and preventing harm. In addition, some students emphasized the importance of being knowledgeable about specific ethical codes and declarations.

The data indicated that PG students possessed a fairly good understanding of research ethics, which was aligned with established ethical principles in health science research. The emphasis on adherence to protocols reflects the importance of following approved methodologies to ensure valid and reliable results. This was consistent with Miteu (2024: 2395-2398) who indicated that adherence to protocols is a fundamental aspect of ethical research.

The focus on protecting participants underscored the ethical duty to safeguard the rights and well-being of research participants. This coheres with the Belmont Report's principle of beneficence, which stresses minimizing harm and maximizing benefits (Nagai, Nakazawa and Akabayashi 2022: 157-170; Miteu 2024: 2395-2398). PG students' recognition of trustworthiness and credibility indicated an awareness of the need for honesty and accuracy, in reporting research findings, which is crucial for maintaining trust in scientific research. The mention of patient care and harm prevention further highlighted the ethical responsibility to prioritize the health and safety of research participants, thereby reflecting the principles of non-maleficence and beneficence. This was consistent with the views of Miteu (2024: 2395-2398) who indicated that research ethics in scientific research aims to ensure that the pursuit of knowledge does not compromise societal or

individual well-being. This was supported by De Poli and Oyebode (2023: 1-28) who indicated that beneficence and non-maleficence have been recognized as core ethical principles in research that involves human participants.

The emphasis on knowledge of specific codes and declarations, such as the Declaration of Helsinki and the Belmont Report, indicated that students were aware of the broader ethical frameworks governing research. This awareness is crucial for ensuring compliance with international and institutional ethical standards. A good understanding of research ethics involves recognizing and applying the principles and standards that guide responsible and ethical research conduct. This understanding is essential for conducting ethical research that maintains the highest standards of scientific integrity. However, a few interpretations of research ethics were unclear and ambiguous, which suggests that students receive information on the conceptualization of research ethics and the principles underpinning it. A holistic definition of research ethics could not be obtained from PG students as research ethics is not rigorously included in the curriculum.

5.2.2 PG students' understanding of the various dimensions of research ethics in health science research

The second objective focused on inquiring about PG students' understanding of the various dimensions of research ethics. The study found that PG students encountered a myriad of difficulties with the development of the methodology of the proposal, particularly with issues related to sampling methods. Correct sampling procedures are crucial to ensuring the validity of the findings and thereby strengthening ethical rigour within a research study. The data suggested that students' inability to utilize the correct sampling strategies constitutes a gap in their preparedness to ensure that research ethics are upheld in a study. Students also did not always apply the correct research paradigm to their study, which suggests a lack of understanding of the methodology. Inevitably this affects the scientific rigor of the study. Moreover, the data reflected that students did not grasp the procedures related to informed consent fully, which reflects the gap in their education or training. The data revealed that different students had different experiences

and understanding of research ethics. Hence, it is essential that PG students are prepared for research ethics and how to deal with ethical issues when conducting their research studies. This preparedness should not only involve preparedness to complete the research proposal but also to understand critical ethical concepts such as anonymity and confidentiality, informed consent, integrity and honesty, respect for persons, justice, beneficence, conflict of interest etc.

The study further revealed that some participants lacked research ethics training during their academic journey, and were reliant on feedback, from academic reviewers to address ethical issues in their proposals, to obtain approval from the REC. Findings from the current study are consistent with findings made by Makola and Ntoyanto-Tyatyantsi (2023: 208-217) and Charpentier-Jiménez (2023: 256-278), who reported a lack of research ethics training amongst PG students. According to Knight (2023: 182), it is crucial for researchers, particularly graduate students, to receive proper training to understand and address ethical issues related to assessing and minimizing risk and vulnerability during the design and planning of research. It is, therefore, important to train graduate students to assist them navigate ethical issues when conducting research. Many of the participants were found to have participated in an online research ethics training programme. This, however, was mandatory and it is possible that students completed it solely to meet the requirement of submitting proof of training when applying for research ethics approval through the IREC. Although completing research ethics training, to fulfil mandatory requirements by the REC is an important step in ensuring that researchers are adequately prepared to conduct ethical research, there remains concern that PG students are not giving research ethics the proper attention it deserves. Hence, the focus on simply meeting the mandatory requirements set by the REC differs from being capacitated to acquire a sound understanding of ethical issues in health science research. This was evidenced in the data obtained from interviewing participants.

A further issue that arose from the findings related to the feedback from review committees. Participants expressed concern over inconsistencies in the review reports regarding critical aspects of their research proposal. Other aspects emerging from the

data, included the turnaround times for the review of a proposal and requirements which involved translation of critical documents for participants into different languages as necessary.

The role of the supervisor was seen to be instrumental in the successful completion of PG qualifications. Some participants enjoyed a positive supervisory experience characterized by the availability of their supervisor, good support and guidance, and clear communication. However, a number of the participants were unsatisfied with the quality and frequency of supervision received. Some of the issues captured during interviews included a need for clearer direction from supervisors, a need for proper guidelines on addressing research ethics in the research proposal, clearer communication and timely feedback from supervisors. The study findings resonated with those of findings made by Petillion *et al.* (2017: 139-154), who also found that students were frustrated with the supervision process and experienced delays due to supervisors offering minimal hands-on assistance or being disengaged from the mentorship process. A study conducted by Makola and Ntoyanto-Tyatyantsi (2023: 208-217) also highlighted the lack of basic support that some students received during their research journeys. This is concerning, as inadequate supervision could be the reason that participants faced challenges in understanding the various dimensions of research ethics in health science research and in addressing critical ethical issues in their research proposals and during the research process.

5.2.3 PG students' levels of preparedness within their disciplines to engage with ethical issues in research

The third objective related to PG students' level of preparedness within their disciplines, is to engage with ethical issues in research. The findings revealed that PG students encountered numerous challenges with critical ethical issues during the research process, making it far from a seamless experience. These challenges interfaced with various ethical considerations, such as obtaining informed consent, securing gatekeeper permission, translating critical documentation for research participants, and managing

data effectively. These difficulties underscored the need for enhanced training and support in research ethics to better equip students for the ethical complexities they face in their academic research.

5.2.4 PG students' understanding of research misconduct activities

The fourth objective related to PG students' understanding of research misconduct activities. The data revealed that participants had a strong understanding of various aspects that constituted research misconduct. Their knowledge is related to a wide range of unethical practices, including plagiarism, failure to obtain informed consent, data manipulation, violation of participants' rights, and causing harm to participants. This awareness reflects their grasp of the critical ethical standards that were essential for conducting responsible and credible research.

The data also revealed that students were aware of the consequences of engaging in research misconduct. They understood that individuals found guilty of such unethical practices, would face a disciplinary committee and potentially, severe repercussions. Participants also indicated that supervisor guidance and support, a module on research misconduct activities, and guidance from the REC play a major role in preventing misconduct.

5.2.5 Integration of research ethics in Health Science PG programmes

The fifth objective is related to the integration of research ethics in health science PG programmes. There was overwhelming support for the development of a research ethics training module. The study revealed that a comprehensive module on research ethics would help PG students understand the importance of ethical considerations and would enable students to address critical issues in their studies. Participants noted that such a module would generate enthusiasm for the subject, rather than them viewing it as a hurdle. Additionally, educating graduate students on research ethics would be beneficial for their careers, as they would be capacitated to apply these principles to the care of

their patients. The data also revealed that it is essential to include important aspects such as the history of research ethics, informed consent, anonymity and confidentiality, research misconduct, data storage, gatekeeper permission, coercion, and the four principles of research ethics in the research ethics module. This finding was similar to that made by Than, Htike and Silverman (2020: 379-398) whose study revealed that most participants agreed that research ethics should be taught as a mandatory module at the PG level and that everyone should receive some training in research ethics. Furthermore, a study conducted by Ghimire *et al.* (2024: 174-179) also found that participants had agreed that research ethics should be a mandatory subject in the PG curriculum.

5.3 CONCLUSION

The study aimed to explore how PG students conceptualize research ethics. The Faculty of Health Sciences at the UOT offers a wide range of PG qualifications across various Healthcare professions, where research ethics forms an integral component of the completion of their research studies. Understanding and adhering to research ethics principles are fundamental requirements for students pursuing these qualifications, ensuring the ethical conduct of research and the integrity of their academic endeavours. The study revealed that while PG students are introduced to research ethics during their undergraduate studies, through different modules and at the PG level through an online training course, the University does not provide a compulsory research ethics module. This gap results in varying levels of understanding of research ethics among students and hinders their ability to address ethical issues effectively at the outset of their research. Research ethics must not be regarded superficially at the onset of the research proposal stage.

5.4 RECOMMENDATIONS

Drawing from the study's findings, the following recommendations can be put forward:

1. Development and implementation of a comprehensive Research Ethics Module across the Faculty of Health Sciences for Health Science research. This module must be compulsory for all PG students upon registration. The module should encompass the following components:

Table 6: Components of a Research Ethics Module

Module Component	Description
Introduction	Definition of Research Ethics
History of Research Ethics	Tuskegee Syphilis Trials World War II Nazi Experiments The Willowbrook Case
Foundational Documents in the Field of Research Ethics	Nuremberg Code Declaration of Helsinki Belmont Report International Ethical Guidelines for Biomedical Research Involving Human Subjects
Principles of Research Ethics	Autonomy Beneficence Non-Maleficence Justice
Critical Ethical Issues	Informed Consent, Assent, Vulnerable Populations , Confidentiality and Anonymity, Integrity and Honesty, Avoiding Harm, Respect for Persons, Conflict of Interest, Data Management, Gatekeeper Permission, Research Misconduct Bias, Coercion, Translation of Critical Documents
Ethical Review and Approval	Process of Obtaining Ethical Approval from the REC, Recertification, Application for Approval of Amendment, Adverse Events

2. Supervision
    - Offer additional training sessions and workshops to supervisors, aiming to improve their understanding of their roles and obligations, especially in assisting students with research ethics.
    - Offer ongoing updates and refresher courses to supervisors regarding research ethics principles, ensuring they remain informed about the latest guidelines.
    - The University should consider updating the student-supervisor contract to include a stipulation regarding the minimum number of supervision sessions required per year.
    - Annual student progress reports must be made compulsory.

3. Research misconduct
    - The University should consider formalising a misconduct agreement that PG students must sign at the beginning of the research process. This agreement would formally acknowledge the repercussions of misconduct and emphasize the significance of maintaining ethical standards throughout the research journey.

5.5 LIMITATIONS

The study had limitations that need to be acknowledged. First, it was conducted at a single university within the Health Science Faculty, which may limit the generalizability of the findings to other institutions or faculties. Secondly, the sample size was restricted to PG students from this specific context, potentially impacting the diversity of perspectives on research ethics. Additionally, the study relied on self-reported data, which may be subject to bias. Despite these limitations, the study provided valuable insights into the various dilemmas surrounding research ethics amongst PG students in Health Sciences.

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Interview Guide

Research Title: An exploratory study on research ethics at the interface of Health Sciences amongst postgraduates at a University of Technology in KwaZulu-Natal

Thank you for agreeing to participate in my study entitled 'Levels of knowledge and preparedness of postgraduate students to engage with ethical issues in Health Science Research at a University of Technology in KwaZulu-Natal.' The study is being conducted amongst postgraduate students at the Faculty of Health Sciences and is aimed at eliciting information regarding the following: how students conceptualize ethics in research; students understanding of the various dimensions of ethics in Health Science research; student levels of preparedness to deal with ethical issues in research and to enquire about students' knowledge of research misconduct activities.

Participation is voluntary, and you may withdraw from the study at any point. There will be no consequences to you should you wish to withdraw. Your details will be kept confidential and will not be made public when reporting the results.

A. General Information:

1. Gender:
2. Department:
3. Primary Qualification:
4. Postgraduate Qualification:
5. Year of Study:

B: Interview questions:

1. Can you describe how you understand ethics in health science research?
2. Can you share what has been your personal journey with ethics in Health Science?
3. Please share what have been your personal challenges related to ethics in relation to your study.
4. What do you think are the major ethical issues that challenge students who do health science research. e.g. humans; laboratory
5. Can you share whether you were prepared to address the ethical issues in your research in your Department
    - Informed consent
    - Gatekeeper permission
    - Storage of data
    - Anonymity and confidentiality
6. Can you describe what you understand research misconduct?
    - Plagiarism
    - Falsifying information
    - Fabrication of data
7. What are your views regarding what better supervisory support you can receive regarding ethics
8. What are your views regarding a module on ethics for health sciences research
9. What specific aspects should be covered?

APPENDIX B

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2375
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

21 October 2020

Ms L Deonarian
[redacted]

Dear Ms Deonarian

Levels of knowledge and preparedness of postgraduate students to engage with ethical issues in Health Sciences Research at a University of Technology in KwaZulu-Natal

I am pleased to inform you that **PROVISIONAL APPROVAL** has been granted to your proposal subject to:

- Piloting of the data collection tools. *Please note that should there be any changes to the data collection tools, in a letter signed by the researcher and supervisor, list the changes to the document and submit to IREC with the final data collection tools. Even when there are no changes to the data collection tools, IREC has to be notified.*
- Obtaining and submitting the necessary gatekeeper permission/s to Institutional Research Ethics Committee (IREC).

PLEASE NOTE THAT THIS IS NOT A FINAL APPROVAL LETTER. KINDLY SUBMIT THE ABOVE MENTIONED DOCUMENTS WITHIN THREE MONTHS TO THE IREC OFFICE. DATA COLLECTION CAN ONLY COMMENCE WHEN IREC ISSUES FULL APPROVAL

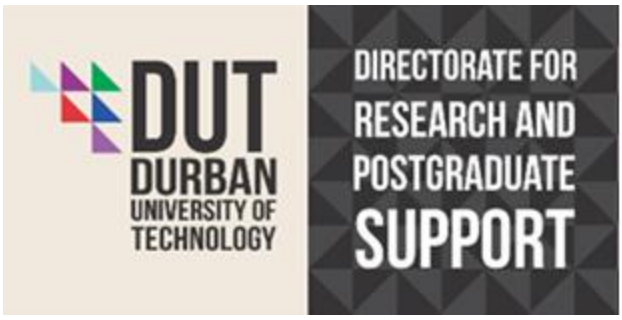
The Proposal has been allocated the following Ethical Clearance number **IREC 100/20**. Please use this number in all communication with this office.

Approval has been granted for a period of **ONE YEAR**, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Yours Sincerely

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2020 -10- 21
INSTITUTIONAL RESEARCH ETHICS COMMITTEE
SOUTH AFRICA

Dr M A Sathar
Deputy Chairperson: IREC



Directorate for Research and Postgraduate Support
Durban University of Technology
Tromso Annexe, Steve Biko Campus
P.O. Box 1334, Durban 4000
Tel.: 031-3732576/7
Fax: 031-3732946

22nd October 2020
Ms Lavisha Deonarian
[redacted]

Dear Ms Deonarian

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research and Innovation Committee (IRIC) has granted **Full Permission** for you to conduct your research "Levels of knowledge and preparedness of postgraduate students to engage with ethical issues in Health Sciences Research at a University of Technology in KwaZulu-Natal" at the Durban University of Technology.

The DUT may impose any other condition it deems appropriate in the circumstances having regard to nature and extent of access to and use of information requested.

We would be grateful if a summary of your key research findings would be submitted to the IRIC on completion of your studies.

Kindest regards.
Yours sincerely

DR LINDA ZIKHONA LINGANISO
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT DIRECTORATE

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

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APPENDIX D

13 November 2020

Ms L Deonarian
[redacted]

Dear Ms Deonarian

Levels of knowledge and preparedness of postgraduate students to engage with ethical issues in Health Sciences Research at a University of Technology in KwaZulu-Natal
Ethical Clearance number **IREC 100/20**

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely

Dr M A Sathar
Deputy Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2020 -11- 13
INSTITUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

Notice to PG Supervisors at the Faculty of Health Sciences for the distribution of the invite to their respective students to participate in the study

Dear Supervisor

I am a Masters student registered at the Faculty of Health Sciences. The title of my study is 'Levels of knowledge and preparedness of postgraduate students to engage with ethical issues in Health Science Research at a University of Technology in KwaZulu-Natal.' The aim of the study is to determine PG student's knowledge and preparedness to engage with ethical issues in Health Science Research. I appeal to you to kindly assist me with the distribution of my invite to your respective PG students.

Thank You

Regards
Lavisha Deonarian

Invite to PG students to participate in the study

Dear Student

I am a Masters student registered at the Faculty of Health Sciences. The title of my study is 'Levels of knowledge and preparedness of postgraduate students to engage with ethical issues in Health Science Research at a University of Technology in KwaZulu-Natal.' The aim of the study is to determine postgraduate student's knowledge and preparedness to engage with ethical issues in Health Science Research. You are kindly invited to partake in my study. This entails partaking in an interview either via MS Teams or face-to-face. The interview will not be more than an hour. Should you agree to participate in my study, please respond to your Supervisor, giving permission to forward

your details to me. I will be in contact with you to set up the interview and will share the informed consent document with you.

I look forward to a favorable response from you.

Thank You

Regards
Lavisha Deonarian

Dear Participant

Thank you for considering partaking in the study. The details of the study are outlined below.

Title of the Research Study: An exploratory study on research ethics at the interface of health sciences amongst postgraduates at a University of Technology in KwaZulu-Natal

Principal Investigator/s/researcher: Ms Lavisha Deonarian (Master of Health Sciences Candidate).

Co-Investigator/s/supervisor/s: Professor R Bhagwan, D Phil: Community and Development Disciplines (Supervisor); Professor M N Sibiya, D Tech: Nursing (Co-supervisor).

Brief Introduction and Purpose of the Study: Research ethics is that branch of research that ensures protection of human participants. Since health research involves human participants, it is of utmost importance to protect their rights, dignity and welfare. It is also essential for students, especially those conducting research in the Health Sciences discipline to have knowledge of the principles of ethics. This study aims to explore postgraduate student's experience of ethics and ethical issues within the context of health sciences.

Outline of the Procedures: The researcher obtained permission from the Durban University of Technology to recruit you as a participant. In addition, permission was obtained from your Head of Department to recruit you as a participant. You are required to complete the consent form attached to this document to consent to partaking in this study. An interview will be conducted for this study. This will be done face-to- face or via MS Teams. Once you agree to participate in this study, the researcher will be in touch with you to arrange a date and time for the interview to be conducted. The interview will not be more than an hour. The consent form must be e-mailed to the researcher on lavishad@dut.ac.za. The information section of the document remains with you.

For face-to face interviews, a mask and sanitiser will be provided to you. Social distancing will also apply. Face-to-face interviews will be held at the IREC office, Berwyn Court, Gate 1, Steve Biko Campus.

All interviews will be recorded. These recordings will be kept confidential.

Risks or Discomforts to the Participant: There will be no risks or discomfort to you.

Benefits: Results from the study have the potential to increase ethics training/ ethics workshops for you and future students

Reason/s why the Participant May Be Withdrawn from the Study: Participation is voluntary, and you may withdraw from the study at any point. There will be no consequences to you should you wish to withdraw. The researcher may withdraw you from the study due to non-compliance, an adverse event or in the event of you being ill and cannot complete the questionnaire.

Remuneration: There will be no remuneration to you for partaking in the study.

Costs of the Study: There will be no cost to you for partaking in the study.

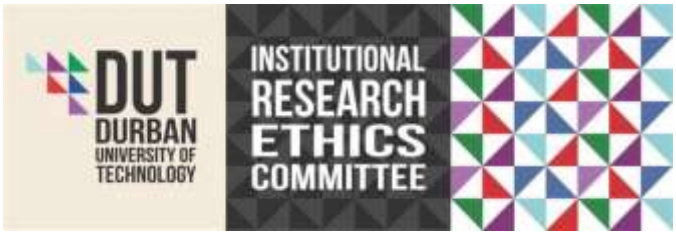
Confidentiality: Your details will be kept confidential and will not be made public when reporting the results.

Research-related Injury: There are no risks involved in this study and no harm will come to you by partaking.

Storage of all electronic and hard copies including tape recordings: Hard copy data will be stored in a locked cupboard in the supervisor's office or in a steel cupboard in the researcher's home for a period of 5 years. Only the researcher and supervisor will have access to the data. The data will be securely shredded after 5 years. Electronic data will be password protected and stored on a secure laptop. Only the researcher and supervisor will have access to the data. Data will be securely deleted after 5 years.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Ms Lavisha Deonarian [redacted]), my supervisor Prof R Bhagwan [redacted] or the Institutional Research Ethics Assistant Ms K Naicker on 031-3732375. Complaints can be reported to the Acting Director: Research and Postgraduate Support on 031-373 2577 or researchdirector@dut.ac.za



CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Lavisha Deonarian (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: IREC 100/20
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	**Date**	**Time**	**Signature/Right Thumbprint**

I, Lavisha Deonarian (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Lavisha Deonarian	29-09-2022	L Deonarian
Full Name of Researcher	**Date**	**Signature**

Full Name of Witness (If applicable)	**Date**	**Signature**

Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
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www.dut.ac.za

29 March 2022

Ms L Deonarian
[redacted]

Dear Ms Deonarian

Application for Amendment of Approved Research Proposal

An exploratory study on research ethics at the interface of health sciences amongst postgraduates at a University of Technology in KwaZulu-Natal

I am pleased to inform you that your application for amendment have been approved.

Yours Sincerely

_____
Prof J K Adam
Chairperson: IREC

MS PREM COOPOO

EDITOR

+27 83 645 7466
pcoopoo@gmail.com

PC Proofreading

EDITING AND PROOFREADING SERVICES

BA Social Work, BA Honours (Psychology), M.Med.Sc. Social Work (UKZN, South Africa), Certificate in Strategic Quality Planning (Kangan Batman Tafe, Australia)

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8 August 2024

To: Ms Lavisha Deonarian

[redacted]

[redacted]

Dear Ms Deonarian,

Editing of Master's Degree Dissertation

This confirms that I have fully edited your Master's Degree Dissertation. I hereby also confirm that I submitted the completed work to you – a tracked version and a clean copy – on 8 August 2024.

Yours sincerely,

Ms Prem Coopoo