The research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa

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PREFACE

‘My help comes from the Lord who made heaven and earth.’ Psalm12:2. I am truly grateful to God that He has been with me this far.

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ABSTRACT

Introduction and background: Research capacity is a crucial requirement for higher education institutions (HEIs) to render quality nursing education and maintain their credibility. The proposed transformation in nursing education presents new challenges for nurse educators employed by provincial nursing colleges, especially in the areas of research and academic qualifications. Nurse educators at provincial nursing colleges should be prepared for their new roles. Therefore, it is important that provincial nursing colleges have a deeper understanding of current research capacity and research-capacity development needs of nurse educators at these colleges. This study specifically focuses on provincial nursing colleges in the Gauteng province of South Africa.

Aim: This study aims to gain a deeper understanding of the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

Method: A descriptive quantitative, cross-sectional survey design was used for data collection. The population was nurse educators employed by four provincial nursing colleges in Gauteng province for a period of at least six months. Data was gathered from 137 respondents using a self-administrative questionnaire.

Results: The finding revealed that the nurse educators perceived their research skills as reasonable in all the research phases, with the highest (M = 2.94, SD 0.940) for the exploratory phase and lowest for the data-analysis phase (M = 2.48, SD 0.949). The nurse educators also indicated a need for institutional support in terms of time and funding to pursue their studies, to improve their research skills and their overall research capacity.

Conclusion: Provincial nursing colleges should design specific strategies aimed at developing the research capacity of nurse educators, based on their current research capacity and research-capacity development needs, in order for the colleges to effectively transform and thrive as HEIs and to develop nurse educators as academics.

Keywords: research capacity, research-capacity needs, nurse educators, nursing college.

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

Research capacity is an essential requirement for higher education institutions (HEIs) to render a quality nursing education (Quimbo & Sulabo, 2014:1955). The research capacity of academics in HEIs has been explored internationally (Segrott *et al.*, 2006:638). However, in reviewing current national published empirical research, there is a scarcity of published data on specifically the research capacity and research-capacity development needs of South African nurse educators at provincial nursing colleges. Thus, this study aims to describe research capacity and research-capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa.

1.2 Background

Nurse educators, regardless of work context, are all nursing scholars engaged in knowledge dissemination and critique and the production of new knowledge, either through their role as researchers or by encouraging students to become researchers (McAllister & Flynn, 2016:122; Oprescu *et al.*; 2017:167). In order to have a successful and productive career, they need to incorporate teaching, research and professional development in their daily work (Oprescu *et al.*; 2017:167; Seekoe, 2015:58). However, at provincial nursing colleges, the focus is more on teaching content-based curriculum than on research (Roets & Lubbe; 2014:4). These colleges do not recognise academic competencies such as research as one of the key performance areas of nurse educators at provincial nursing colleges (Seekoe, 2015:58). On the other hand, nurse educators at universities are obliged to conduct research (Van Rensburg *et al*., 2017:2).

Currently in South Africa, most nurses receive their training at nursing colleges, as evidenced by South African Nursing Council (SANC) statistics that 80% of the four-year programme's graduates received training at provincial nursing colleges (SANC, 2018:1). However, a change in nurse training is envisaged when nursing colleges are transferred to HEIs in the near future.

Transferring nursing education to HEIs is not an isolated sub-Saharan phenomenon but a global trend (Ayandiran *et al.*, 2013:3). Internationally, the training of nurses has been transferred from the apprentice-style, hospital-based setting to tertiary-education institutions. This has resulted in a significant shift away from the sole aim of educating student nurses, to more complex and challenging work such as research and scholarly activities (McDermid *et al.*, 2013:46). In South Africa, the cut-off date for enrolling nursing students in academic programmes not aligned with the Higher Education Qualification Framework is 31 December 2019 (DHET, 2016). Therefore, provincial nursing colleges must evolve to become autonomous HEIs by the year 2020. This

transformation process, though positive in both approach and impact, poses numerous challenges for the current national nursing-education system (Blaauw *et al.,* 2014:2; Roets & Lubbe, 2014:4). One of the challenges highlighted in literature is that most of the institutions that have undergone this process end up being staffed by a large number of college lecturers who struggle to assume academic identity at HEIs (Comiskey *et al*., 2015:647; Duffy, 2013:620; Seekoe, 2015:59; Wyllie *et al.*, 2016:213).

The HEI's core function is teaching and research, as stipulated in the Higher Education Act (101 of 1997). The HEIs receive a government subsidy for teaching outputs (Altbach, 2014:1313; DHET, 2015:4). In addition, these institutions rely on research output as a major avenue for generating revenue (Smeltzer *et al.*, 2014:271). However, research productivity is unknown to those in provincial nursing colleges (Roets & Lubbe, 2014:4). It is clear that nurse educators would be disadvantaged by HEI criteria for advancement or promotion that prioritise research productivity above other academic duties such as teaching and administration (Gething & Leelarthaepin, 2000:148). Furthermore, provincial nursing colleges would be disadvantaged in terms of credibility and status within the higher education sector (Gething & Leelarthaepin, 2000:148). Last but not least, the lack of research production would lead to stagnation of nursing-education knowledge (Kalb *et al.*, 2015:212). Therefore, taking into consideration that nursing programmes are migrating to higher education, research and public presentation skills are essential for all nurse educators at provincial nursing colleges (Van Rensburg *et al*., 2017:2; Wyllie *et al.*, 2016:213). This means that nurse educators at provincial nursing colleges will have to develop their research capacity in order to thrive in HEIs (Frantz *et al*., 2013:48; Van Rensburg *et al.*, 2017:2). The individual nurse educator's development needs would dictate the interventions required. Thus a study of current research capacity and research-capacity needs of nurse educators is needed (Duffy, 2013:620; McAllister & Flynn, 2016:123; Van Rensburg *et al*., 2016:12; Wyllie *et al*., 2016:213).

Segrott e*t al*. (2006:640) define research capacity as the ability of an individual within a discipline or a professional group to undertake high-quality research. Research capacity entails the ability to learn (Frantz *et al*., 2013:48) and to develop and execute the skills (Uys & Klopper, 2014:1909) necessary to engage in research activities. Through this, there is a progressive research continuum (Howard *et al.*, 2013:180) that leads to success of individuals' and departments' research outputs (Buchholz *et al.*, 2015:665; Gullick & West, 2016:614). The ability to conduct research requires knowledge of common research language and skills (Gullick & West*,* 2016:609; McCance *et al*., 2007:58; Roets & Bhembe, 2016:212), a positive attitude towards research (Levine *et al.,* 2013:2), and confidence to undertake research activities (Edward, 2015:120). Research capacity in nursing education translates to the ability of the nurse educator to learn,

understand, conduct, use, develop and sustain research and research activities in the higher education environment in South Africa.

However, nursing education in South Africa is experiencing a deficit in the research capacity required to meet future national health-care demands (Sheehan *et al.*, 2015:13). International studies conducted on the research capacity of nurse educators demonstrate that they have several research-capacity needs that hinder their participation in research. These studies revealed that most nurse educators do not feel confident in undertaking research (Gething *et al*., 2001:228; Oprescu *et al.*, 2017:166; Wyllie *et al.,* 2016:216). Nationally, lack of research skills – particularly in publication and conference presentation – were identified by Van Rensburg *et al.* (2017:10) as major research-capacity development needs for nurse educators not attached to universities. Van Rensburg *et al.* (2017:10) revealed that, despite initiatives to improve research capacity of nurse educators, there had been no positive improvement regarding publication output and conference presentations. However, no research-capacity assessment was done, as their project focused on participants' career needs and not their knowledge (Van Rensburg *et al.,* 2017:6). Cooke (2005:4) and Edwards *et al.* (2016:21) emphasise that it is critical to do a thorough assessment of the knowledge and skills levels of the target group before planning research-capacity development initiatives.

The research productivity of academic staff depends on the presence of contextual factors such as doctoral preparation, publication opportunities, and availability of resources. These enable staff to conduct and publish the research that generates knowledge for nursing practice (Griffioen *et al*., 2013:26; Uys *et al*., 2013:1). However, some nurse educators at public nursing colleges do not have higher degree qualifications (Begley *et al*., 2013:1; McDermid, *et al*., 2013:46; Comiskey *et al.,* 2015:648), e.g. a Master's or PhD degree, and this may hinder their research productivity. Therefore, these nurse educators will have to upgrade their qualifications (Melnyk *et al.,* 2012:412; Oprescu *et al.*; 2017:167) and develop appropriate research skills (Van Rensburg *et al*., 2017:11). This underlines the importance of gaining a deeper understanding of the current research capacity of nurse educators at nursing colleges to ensure that the institutions and their academic staff meet academic and research requirements (Whitworth *et al*., 2012:3).

Several authors have identified different strategies that may assist in addressing the research-capacity needs of nurse educators at HEIs. Some of these strategies include creating and embracing a research culture (Roets & Lubbe, 2014:4; Smeltzer *et al*., 2014:271); providing research training (Asuquo *et al.,* 2013:48; Roets & Bhembe, 2016:222); building infrastructure and increasing resources (Asuquo *et al.,* 2013:48; Griffioen *et al*., 2013:26; MacIntyre *et al*., 2013:687; Segrott *et al.,* 2006:646; Squires *et al*., 2017:5); mentoring (Segrott *et al.,* 2006:645; Masika *et al*., 2014:53); balancing the needs of individual and organization (Roets & Bhembe,

2016:221); and building communities of research practice (Segrott *et al.,* 2006:646). However, the first step is to map current capacity, including the nature and extent of research-training needs, to select the best strategies (Bosch & Taylor, 2011:445; Oprescu *et al*., 2017:165).

1.3 Problem statement

At HEIs, research productivity is mandatory to maintain quality research and output. Thus, the proposed transformation of nursing education in South Africa presents new challenges for nurse educators employed at provincial nursing colleges, especially with regard to research and academic qualifications (Cantwell & Mathies, 2012:311; Van Rensburg et al., 2017:2). Given this background, it is evident that this transformation would require the nurse educator to be involved in research as well as teaching (Duffy 2013:620; Allister et al., 2011:6).

This is of concern because several studies (Ayandiran et al., 2013:4, McDermid et al., 2013:47; Seekoe, 2015:59; Roets & Bhembe, 2016:211) found that the academics who were transferred to HEIs were not prepared for their new roles and were overwhelmed by having to study for a Master's degree, teach and conduct research. To date there is little published evidence on the research capacity and research-capacity development needs of public nursing colleges, specifically in the Gauteng province. Despite evidence of research-capacity development initiatives, public nursing colleges and their staff still identify a need to improve their research capacity (Roets & Lubbe, 2014:9) and research productivity (Van Rensburg et al., 2017:2) as well as a need for help in preparing them for their new research responsibility (Roets & Bhembe, 2016:222). Based on this, a descriptive quantitative research study which gains a deeper understanding of the research capacity and research-capacity development needs can contribute by providing new evidence and recommendations that assist the nurse educators and their institutions in preparing for their new research responsibilities.

The findings and recommendations of this study might also assist public nursing colleges, when formulating the institutional research policy, to appreciate the perceptions and views of the individuals employed at these institutions (Bosch & Taylor, 2011:445; Wyllie et al., 2016:213).

Based on the above, the research question for the study is as follows: What is the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa?

1.4 Aim and objectives of the study

This study aims to gain a deeper understanding of the current research capacity and research-capacity development needs of nurse educators at the four Gauteng provincial nursing colleges in South Africa. The following objective has been set to achieve the aim of the study:

- To identify and describe the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

1.5 Researcher's assumptions

Assumptions are statements taken for granted or considered to be true even though they have not been scientifically proven (Grove et al., 2013:41). They determine the nature of concepts, definitions, purpose and relationships; they are the fundamental underlying truth from which theoretic reasoning proceeds (Brink et al., 2012:27). Assumptions are also known as paradigms. Polit and Beck (2012:11) describe a paradigm as a worldview, which translates to a general perspective on the complexities of the world.

The researcher's assumptions consist of 1) meta-theoretical assumptions that convey the researcher's personal view concerning man, society, health and nursing; 2) theoretical assumptions, and 3) methodological assumptions as they apply to the study.

1.5.1 Meta-theoretical assumptions

Meta-theoretical assumptions explain the researcher's view of the world which, being natural philosophy, cannot be tested (Polit & Beck, 2012:720). In this study, they reflect the researcher's beliefs of man, nursing, society, and health. The philosophical assumptions of a Christian worldview will form a base for this study.

1.5.1.1 View of a human being

A human being is a psychosocial being and represents the highest level of development of all living organisms on Earth. The Bible phrase in Genesis 1:27 "so God created man in his image" expresses the uniqueness and the superior dignity of humankind. The book of Hosea 4:6 contends that, for a man to survive, he needs to be knowledgeable (Bible, 2013). The human being in this study is a nurse educator. The researcher views nurse educators as powerful beings created by God, who should possess wisdom and knowledge to serve God's people.

1.5.1.2 View of nursing

The researcher views nursing as a calling to serve God's people. The researcher believes that God has chosen the nurse educators from among many nurses, to be the source of knowledge to others – just like Bezalel, the son of Uri (Exodus 35:31-34). The nurse educators must serve God's people through transferring knowledge to the students who will in turn take care of God's people. Such service requires a knowledgeable and skilled person. When the nurse educators possess adequate skills, abilities and knowledge to teach others, it pleases God and that also glorifies Him. However, God does not automatically give the capacity to individuals. Therefore, the nurse educators have the responsibility to grow their knowledge, abilities and skills so that they can be beneficial to society. Thus the nurse educator should be capable of performing quality nursing research to promote research-based practice.

1.5.1.3 View of environment

An environment is any or all aspects of an organism's surroundings, both internal and external, which influence its growth, development and behaviour (Oxford dictionary of nursing, 2014:175). The environment is the world we live in; it was created perfect by God but became disorganised as a result of sin. The researcher views the provincial nursing college as a flexible environment that has a strong influence on the growth and development of nurse educators. The nursing college environment can promote, or hinder, or maintain achievement of research capacity for the nurse educators. The researcher believes that the nursing-colleges' environment should be conducive for nurse educators to conduct quality research.

1.5.1.4 View of health

Health is defined by the World Health Organization (2001:8) as "a state of well-being physically, emotionally and socially and not merely an absence of disease or infirmity". Health as a continuum of wellness and illness is dynamic and constantly changing. Optimal wellness is achieved when the individual's needs are all met, while illness signifies unmet needs. The Bible emphasises that every person is responsible for living a healthy lifestyle (Ephesians 5:29). For this study, "health"' refers not merely to the wellbeing/capability of a nurse educator to conduct quality research but also in the sense that the research findings will inform the nursing practice and lead to health and well-being of patients. For the nurse educators to conduct quality research output, and to be the light of the world, their research needs must be met. In such circumstances, the nurse educators will not be weary in their profession, which is pleasing to God.

1.5.2 Theoretical assumptions

Theoretical assumptions are a set of interrelated statements intended to explain some aspect of social life according to relevant facts, laws and principles (Babbie, 2014:44). In this study, theoretical assumption entails central theoretical argument and conceptual definition of critical variables to promote understanding of these concepts, thereby providing information about the framework of the study.

1.5.2.1 Central theoretical argument

The central theoretic argument is described by Creswell (2014:77) as the core argument or significant points that need to be addressed in the proposal. These points all need to be interconnected to provide a cohesive picture of the entire project. In this study, quantitative descriptive data will be collected and analysed to provide a cross-sectional description of the research capacity and research-capacity development needs of nurse educators in the four provincial nursing colleges in Gauteng.

1.5.3 Definition of key concepts

Nurse Educator is a Professional Nurse with an additional qualification in nursing education and is registered as such with the SANC (Bruce *et al*., 2011:14). The nurse educator teaches and prepares competent nursing practitioners in theory and practice, to care for patients or clients (Bruce *et al*., 2011:14). In this study, the nurse educator will mean an individual who is qualified to teach nursing programmes, and who is currently teaching in one of the four Gauteng provincial nursing colleges.

Nursing College refers to a post-secondary educational institution that offers nursing education programmes at basic and post-basic levels, where such education has been approved in terms of the Nursing Act (SANC, 2013:3). A nursing college in this study is a public nursing institution in the Gauteng Health Department, accredited to offer nursing education in association with a university, and will be referred to as provincial nursing college/s throughout the study.

Higher Education Institutions (HEIs) refers to any institutions that provide higher education (on a full–time or part time or distance basis) which is merged, declared, established or deemed to be established as a public higher institution under the Higher Education (Act 101 of 1997) as amended. In this study, Higher Education Institution will mean an institution that is accredited by the Council on Higher Education to offer higher education programmes.

Research capacity is the ability to conduct quality/useful research and to understand, appraise, utilise and develop research evidence in providing high-quality health care (Segrott *et al.,*

2006:639; Duffy *et al.*, 2015:158). In this study, the nurse educators' ability to understand, conduct, appraise, utilise and conduct and sustain quality/useful research in an academic setting will be investigated through exploring and describing the nurse educator's current perceived research-skills level.

Rothwell and Kazanas (as cited by Opperman and Meyer (2008:35), defined **development need** as "a performance gap separating what people know, do or feel from what they should know, do or feel to perform competently". The development need should always be linked to the essential knowledge, skills and attitudes that an individual must possess to perform his/her work competently and thereby accomplish the desired results (Opperman & Meyer, 2008:35). In the context of this study, **research-capacity development needs** are the knowledge, skills and abilities that need to be developed to conduct quality and useful research in nursing education. This study identifies and describes the research knowledge and skills level that need to be improved, as recognised by nurse educators.

1.5.4 Methodological assumptions

Brink *et al*. (2012: 68) describe methodological beliefs as preferences, assumptions and presuppositions about what ought to constitute good research. Any decisions made by the researcher with regard to a research problem are guided by these beliefs, which also set the parameters of the project. It is essential that a researcher should set scientific boundaries and directions to enhance validated research findings, as these findings inform nursing practice. Grove *et.al* (2013, 17) emphasise that research is a major force in developing a scientific base for nursing practice. This study is conducted to identify and describe the research capacity and research-capacity development needs of nurse educators, and to disseminate the results in the form of recommendations to public nursing colleges as suggested by Polit and Beck (2012:3).

The reality of modern nursing is that nurses worldwide are expected to understand and conduct quality research in order to base professional practice on sound nursing research. In order to conduct sound research, nurses must possess the relevant skills, knowledge and attitude. Polit and Beck (2012:3) have defined nursing research as systemic enquiry that uses disciplined methods to answer questions or solve problems. The main aim of research is to develop, refine and expand knowledge, and nursing studies must focus on developing trustworthy evidence about issues of importance to the nursing profession, including nursing education. In this study the research capacity and research-capacity development needs of nurse educators are identified and described, based on the identified aim and objective.

1.6 Research design and methods

1.6.1 Research design

A descriptive quantitative (Polit & Beck, 2012:201) cross-sectional survey (Brink *et* al., 2012:101) was used to identify and describe the current research capacity and research-capacity development needs of nurse educators within the context of Gauteng provincial nursing colleges in South Africa.

1.6.2 Research Methods

The research setting, the population and sampling, the instrument for data collection, the procedure to collect the data, data analysis, and measure to ensure rigour, will be discussed.

1.6.2.1 Setting

The setting refers to the specific places where information is gathered (Polit & Beck, 2012:49). The nursing colleges of interest are the four provincial nursing colleges in the Gauteng province in South Africa. The nursing colleges have a population of (N=340) nurse educators. The researcher selected these nursing colleges for reasons that included accessibility (regarding distance), financial implications, the time-frame for data collection and because these colleges are among the nursing institutions that must transit to higher education. The colleges were anonymised to avoid linking the information that was provided by participants, to the colleges.

1.6.2.2 Study population and sampling

1.6.2.2.1 Study population

The target population in this study is nurse educators at four Gauteng provincial nursing colleges in South Africa. The nurse educators employed by the colleges of interest were (N=340).

1.6.2.2.2 Sample

An all-inclusive sample was used to obtain the highest-possible number of participants and to ensure that the sample is representative. The nurse educators who participated in the pre-test and the main study were (n=13) and (n=124) respectively. Table 1.1 below outlines the inclusion and exclusion criteria:

Table 1-1: The inclusion and exclusion criteria of the sample

Inclusion	**Rationale**
Nurse educators employed at Gauteng provincial nursing colleges for six months or more.	These nurse educators have been exposed to the college environment and are therefore information-rich participants.
Nurse educators who were available during the data-collection period.	Nurse educators who were available during the period of data collection were invited to participate in the study.
The participants who are willing to answer the questionnaire in English.	English is the medium of instruction at all Gauteng provincial nursing colleges and therefore all the nurse educators would understand the questionnaire.
The exclusion criteria	**Rationale**
Nurse educators employed by private nursing colleges.	The study aims to explore the research capacity of nurse educators at provincial nursing colleges.
Nurse educators employed for less than six months.	Nurse educators employed for less than six months are still settling in and may not be sure about all policies and procedures; they are therefore not considered suitable candidates for a study requiring information-rich participants.

1.6.2.3 Data collection

1.6.2.3.1 Data-collection instrument

A structured, self-reporting research-capacity survey questionnaire (Akerjordet *et al.,* 2012a) was used to measure the research capacity of nurse educators of the Gauteng provincial nursing colleges in South Africa. The questionnaire was based on an instrument that was previously used in Norway and Australia (Akerjordet *et al.,* 2012a; Gething & Leelarthaepin, 2000; Gething *et al.*, 2001) to measure the research capacity of clinical nurses in a university-hospital setting and nurses employed as academics in the university sector. The Cronbach's alpha coefficient, as per

above-mentioned studies, ranged from 0.90 to 0.97, indicating a very high level of internal consistency within categories. The Cronbach's alpha for the overall questionnaire was 0.99, which indicates considerable consistency between individual items and between categories of items, suggesting that perceived competence extended across all stages of the research process The instrument had high content and face validity (Akerjordet et al., 2012a; Gething *et al.*, 2000:148).

The questionnaire (Annexure E) that was used to identify and describe the nurse educators' research capacity and research-capacity development needs in provincial nursing colleges in South Africa comprised of three sections. Permission to use the questionnaire was granted by the author as reflected in Annexure D. The demographic section (Section A) was amended to fit the context of the study and consists of nine closed-ended questions that gathered information on the employment and demographic data of the nurse educators. The interest in research and research-needs section (Section B) consisted of 14 questions, of which seven were closed-ended and seven open-ended questions - and remained the same for this study. The first five questions of Section B focused on the nurse educators' current research engagement. Questions six to nine (Section B) focused on the nurse educators' current overall research skills and research interest. The remaining five questions in Section B (questions 10 to 14) were open-ended and focused on the nurse educators' perceived research-development needs in the context of the college setting.

Section C, which focused on the nurse educator's research-skill level, was (in consultation with a statistician) amended as four of the original 59 questions were double-directed questions. The final questionnaire, specifically for Section C, consequently had 63 questions pertaining to research-skills level within the seven different phases of the research process. These were the exploratory phase (7 items), literature review (3 items), design phase (17 items), preparation phase (9 items), action phase (3 items), data analysis (8 items), and writing up (16 items). This section of the questionnaire used a six-point Likert Scale ranging from 'poor' (1) to 'excellent' (5) and 'unsure' (6); the last-mentioned was included to avoid skewing the data, as some participants might be unsure of their research-skill level.

1.6.2.3.2 Pre-test

In this study, the researcher employed a small-scale pre-testing of the data-collection instrument. The researcher did not make use of the formal pre-testing method of cognitive interviewing (Ekinci, 2015:129) as the instrument has been used in other research which has proven the instrument to be both valid and reliable (Akerjordet e*t al*., 2012:826). The aim of this approach was to identify potential contextual and language barriers and to assess the time required to refine the instrument and data-collection procedure before the actual data collection commenced.

The pre-test was conducted with (n=13) nurse educators who have experience of teaching at provincial nursing colleges. The nurse educators were asked to complete the questionnaire from the viewpoint of a participant. After completion, the nurse educators had to evaluate the survey and make comments aimed at identifying possible barriers and judging applicability (e.g. language comprehension and participation time).

The evaluative feedback (both verbal and written) from the nurse educators was reviewed and evaluated in consultation with a statistician to consider possible amendments to the questionnaire (to improve the question format and the overall data-collection process). The findings from the pre-test study were used in the primary research and the researcher adhered to the informed consent, data collection and analysis procedure as discussed for the primary research (see section 1.7.4.3) in assuring both ethical and scientific integrity of the study.

Amendments made to the original questionnaire, based on the pre-test, included the following:

- The instruction section was modified. Participants were urged to rate themselves by indicating the best description (level) of their current research skill - not their current understanding of the specific research concept.

- Correction of minor language and technical errors were made on the questionnaire.

After amendment, the final questionnaire was submitted to the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University for final ethical clearance before the main study commenced.

1.6.2.3.3 Procedure

Permission to conduct the research was granted by the Human Health Research Ethics Committee (HREC)–NWU–000374-15–A1 of the North-West University (Annexure A1), Gauteng Provincial Protocol Review Committee (PPRC) (Annexure B) and the principals of the four participating nursing colleges (Annexure C1-C4). Each college delegated a nurse educator to act as a mediator and to assist with data collection. The researcher employed an independent person to support and facilitate data-collection activities at all four nursing colleges because the researcher is employed by one of the nursing colleges that participated in the study. The independent person (Annexure H1) and mediators signed a confidentiality agreement (Annexure H2), which highlighted aspects of confidentiality that should be observed during data collection.

The process and field work of data collection was carried out from September 2016 to November 2016. The researcher and the independent person made an appointment with each of the

mediators at the four different colleges and explained the research project, the inclusion-exclusion criteria and the data-collection protocol. The researcher provided the mediators with the ethical clearance certificate (see Annexure A1), the permission letter from Gauteng Department of Health (Annexure B), and permission letters from the different nursing colleges (see Annexure C1-C4). The researcher discussed the proposed data-collection plan and time-frame with the mediators. The researcher allowed the college mediators to give some feasibility feedback on the proposed data-collection plan. This approach aimed to select the best method for the individual colleges without overstepping the approved ethical and scientific standards.

The researcher followed this mutually-agreed proposed data-collection plan for each college. Some institutions preferred that the researcher should speak to participants in a large group during scheduled academic meetings; other institutions preferred meeting in small groups, i.e. per department or with individuals. Depending on the preference of each institution, the researcher - accompanied by the independent person and mediator - made contact with the nurse educator. The independent person briefly explained the project; the researcher made additions and clarified issues where necessary. Each nurse educator received an informed consent (Annexure F) form and questionnaire. The independent person requested that each nurse educator read the informed consent and decide whether or not they would like to participate in the study. The independent person explained that the nurse educators who were willing to participate in the survey should please return the informed consent and completed questionnaires to the mediator within seven days. The independent person emphasised the importance of honesty when filling out the questionnaire, in order to obtain valuable information. The session explaining the information took approximately 30 minutes to ensure minimal disruption of nurse educators' programmes.

The questionnaires were completed anonymously by each nurse educator, after which they placed the questionnaires in a sealed envelope provided by the independent person and then posted the sealed questionnaires in a sealed box. A convenient place for the sealed box was chosen by the college mediator who kept in mind participants' anonymity and privacy. The submission of informed consent forms was dealt with similarly and they were deposited in a different box, ensuring the participant's privacy.

The independent person and mediators monitored the response rate and reminded the participants to return the questionnaires. The data collection was completed at all the colleges within three months. The sealed boxes were safeguarded by the mediators in a locked office until the independent person collected them. The independent person collected the sealed boxes from the different mediators at the various colleges and handed them to the researcher's supervisor, in the supervisor's office. The supervisor anonymised the nursing colleges by coding the

questionnaire from each institution to blind the researcher. The questionnaires were personally delivered by the supervisors to the Statistical Consultations Services at the Potchefstroom Campus of the North-West University for data capturing and statistical analyses.

1.6.2.4 Data analysis

The questionnaires were read and checked for completeness. The statistician did coding for the data collected on the section of closed-ended questions, and the researcher captured the open-ended responses on an Excel™ spreadsheet. There were no blank questionnaires. However, questionnaires that had a few responses missing in a section were included in the study; these missing responses were captured and included as missing data. Thus, the statistical analyses were based on the responses with no missing or out-of-range data for any variable in the study.

Statistical analyses were conducted using SPSS 24 software (SPSS Inc., Chicago, IL, USA). Frequency distribution, descriptive statistics and inferential statistics were used to analyse the variables, describe and synthesise data with the overall research question in mind. The frequency distribution and percentage, mean and standard deviation were used to interpret the demographical profile, current interest in research, perceived overall research-skill level, and the participant's perceived research-skill level within the different research phases. Spearman's rank order correlations were utilised to determine the nature and the extent of the relationship between the perceived research-skills level and the demographic profile. The Levene's test was used to determine the practical significance of the independent variable and to draw conclusions about nurse educators' different opinions.

The statistician calculated the absolute indices to test the confirmatory factor analysis model, i.e. Chi-Square/df is used as goodness fit test, Comparative Fit Index (CFI) to compare differences or associations between two or more sets of categories in order to determine the probability that the discovered discrepancy could have resulted from sampling error (Mouton, 2018:481), and the Root Mean Square Error of Approximation (RMSEA) to measure the overall discrepancy between the observed conjoint distribution in the sample and the distribution that can be expected if the two variables were unrelated to one another (Mouton, 2018:482). The Chi-Square test interpretation of the size of value depends to a large extent on the viewpoint of the investigator, but in practice ratios as high as 3, 4, or even 5 are accepted as still representing a good model fit (Mueller, 1996:84). The CFI should be more than 0.90, and the RMSEA value smaller than 0.05 to indicate a good fit (Blunch, 2008:116; Mueller, 1996:90). The internal consistency and reliability of the research-capacity questionnaire was tested using Cronbach's alpha (Groove *et al*., 2013:391).

The data collected through the open-ended questions under Section B of the questionnaire (Annexure E) focused on the nurse educators' elaborations on their current research engagements and the research-capacity development needs. This was analysed by the researcher through basic content analysis (Drisko & Maschi, 2016:21; Weber, 1990:5). This technique was chosen as it is typically used in 'coding open-ended questions in a survey aiming at describing attitudes or behavioural responses' (Weber, 1990:9). This study specifically surveyed nurse educators' perceived research-capacity development needs. This technique also supports the aim to collect empirical evidence that provides a deeper understanding from the nurse educators' perspectives (Drisko & Maschi, 2016:22).

All open-ended responses (ranging from single sentences to single words) were captured using Microsoft Excel 2016. The initial coding phase was conducted by the researcher within an Excel™ spread sheet. After this initial coding phase, the preliminary codes identified from the open-ended questions were deliberated, revised and refined in a face-to-face discussion between the researcher and the supervisor. This approach was followed to ensure both the confirmability and dependability (trustworthiness) of the open-ended data. Both the preliminary codes and the open-ended responses were then imported into Atlas.ti 2018™ for managing and further coding and categorising. All the open-ended responses from the nurse educators were combined and the frequency of codes was counted in order to arrange and categorise the collective responses, from least to more important, as perceived by the nurse educators. At this point the data was again deliberated between the researcher and the supervisor and consensus was reached. Annexure I is a schematic representation of this process.

1.7 Role of the researcher

The researcher is the administrator of the study. In accordance with the paradigm of the study, the researcher must maintain objectivity throughout the study irrespective of joy or frustration experienced (Grove *et al.*, 2013:445) in order to fulfil the ultimate purpose of the study. The researcher abided by the stipulated ethical principles during all phases of research. The researcher had strategies in place to handle unforeseen circumstances (Grove *et al*., 2013:444). Once the study is completed, the participants as well as Gauteng provincial nursing colleges and the Gauteng Department of Health (GDoH) will be given feedback on the findings. The researcher will communicate research findings to the participants and their respective colleges through presentations on college research days. A report on the results will be submitted to the GDoH.

1.8 Measures to ensure rigour

1.8.1 Validity

Validity is the degree to which an instrument measures what it is supposed to measure (Polit & Beck, 2012:336). In this study, the questionnaire measured aspects of nurse educators' research activities to draw conclusions about the current research capacity. The content-related validity evidence examined the extent to which the measurement includes all the major elements relevant to research capacity. The measurement of goodness fit for the three-subscale model yielded a CMIN/DF value of 2.806, which is acceptable. However, a relatively unacceptable CFI of 0.740 was obtained and an unacceptable RMSEA value of 0.115 with 90% confidence interval of [0.112; 0.119] was also obtained.

1.8.2 Reliability

Reliability of an instrument is the consistency with which it measures the target attribute (Polit & Beck, 2012:331). In this study, the Pearson's correlation coefficients between the established factors revealed strong correlations ($P < 0.001$) between all items. Cronbach's alpha coefficient ranged from 0.89 to 0.98, indicating a very high level of internal consistency within categories. The Cronbach's alpha for the overall questionnaire was 0.95, which is consistent with the previous study's 0.99 (Gething *et al*., 2001:231; Akerjordet *et al.*, 2012:828).

1.8.3 Trustworthiness

Mouton (2018, 276) describes trustworthiness as another approach to clarify the notion of objectivity and to ensure that the findings and the decisions of the inquiry can be trusted. Trustworthiness of the open-ended section of the results was achieved by ensuring that:

- Persistent observation was achieved through reading the open ended questions and capturing all responses accurately. Initial coding was done by the researcher and verified by the supervisor.
- Data was coded through Atlas.ti 2018™ and was validated by the supervisor and co-supervisor to ensure peer debriefing.
- There were similarities in the research-capacity development needs of the participants which demonstrated dependability of the results.
- Confirmability of data was assured by safe keeping completed questionnaires, meaning that the data collected from participants could be validated.

1.9 Ethical considerations

The researcher was cognisant of ethical issues to be taken into account throughout the research process. Before conducting the research, the researcher obtained written permission from the Human Health Research Ethics Committee (HREC) of the North-West University, the Provincial Protocol Review Committee (PPRC), and the different principals of the four participating nursing colleges. Ethical considerations for this study are in line with the ethical principles as stipulated by the Department of Health's, Ethics in Health Research document (DoH, 2015).

1.9.1 Informed consent

All participants were informed about the purpose and method of the research as well as expectations during the research process (Annexure F), and were given seven days to decide whether they wanted to participate in the study before signing the informed consent and completing the questionnaire. All participants signed the informed consent form. Participants were informed that they could withdraw their participation at any stage of the study and that their withdrawal would not be held against them.

1.9.2 Risk-benefit ratio

There is minimal risk associated with the topic of the research. A possible risk was that a sense of obligation to participate in the study may have been conveyed, as the researcher is employed by one of the nursing colleges. For this reason, an independent researcher was employed to collect the data.

There was also a risk of inconvenience, concerning time. The researcher adhered to the scheduled timeframes so that the participants were not bored, fatigued or inconvenienced regarding their planned schedules. The data-collection plan was adjusted to suit the needs of the participants.

The participants did not incur any expenses through taking part in this study. Therefore, no compensation was given to the participants. However, the researcher provided refreshments during the briefing sessions.

The indirect benefit of the study would be to identify the research capacity and research-capacity needs of the participants in order to recommend appropriate strategies. Study findings may be used by nursing colleges to enhance the research capacity of nurse educators and thus to improve the quality of nursing education.

1.9.3 Principle of justice

The researcher extended the invitation to all the nurse educators who met the selection criteria. Therefore, potential selection bias was eliminated.

1.9.4 Anonymity and confidentiality

The researcher prepared sealed boxes for each college. The participants were instructed not to write their names on the questionnaires. The individual participants and colleges were coded by the supervisor, who received the sealed boxes from the independent person and this was done to blind the researcher and maintain objectivity. The independent person and mediators were asked to sign the confidentiality form. All the raw hardcopy data, like the questionnaires, were locked away in the supervisor's office until the researcher finished the study, after which the raw data was moved to the School of Nursing Science's central security storage facility. All electronically-stored information will be password protected, and stored data will be accessible only to the North-West University team members who are involved in the study. All the raw data collected, resources and reports mentioned will be kept for seven years within the current data-management framework as recommended by the NWU, after which it will be destroyed.

1.10 Significance of the study

Provincial nursing colleges need to capacitate nurse educators in the areas of research and academic qualifications, in preparation for their new roles in the changing higher education landscape (Cantwell & Mathies, 2012:311). Therefore, the provincial nursing colleges have to meet the educators' research needs by designing relevant strategies. This study outcome will identify and describe the current research capacity and research-capacity development needs in the provincial nursing colleges. The findings of this study may be used by policymakers, college principals and the provincial Department of Health to identify relevant strategies that can be used to improve research capacity of nurse educators at nursing colleges. The findings will also assist nursing colleges to identify their research-capacity needs or gaps in preparation for Higher Education status.

1.11 Dissertation Format

This study is in an article format and Chapter 3 is written as a separate unit. Thus repetition of some information is unavoidable. The chapters are divided as follows:

Chapter 1: Overview of the study.

Chapter 2: Literature Review.

Chapter 3: Research Article: Research capacity and research-capacity needs of nurse educators employed at provincial nursing colleges.

Chapter 4: Conclusions, Limitations and Recommendations of the study.

1.12 Summary

This chapter provides an overview of the research study. The meta-theoretical and methodological statements were discussed to explain the background and problem statement of the study. A brief description of the research design, research methods and ethical considerations were included. The detailed review of the literature will be discussed in Chapter 2.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The overall aim of the study, as discussed in Chapter 1, was to identify and describe the current research capacity and research-capacity development needs of the nurse educators at Gauteng provincial nursing colleges in South Africa. The following literature review entails a written summary of all current literature supporting the topic under investigation - that is, research capacity and the research-capacity development needs of nurse educators, specifically those not prepared for their new role as researchers and research educators. Themes that emerged through this literature review included the imminent transition of nursing education to higher education, and the impact of that on the role of the nurse educator who would have to acquire research skills.

2.2 Search strategy employed

The researcher utilised the following databases to search for the most relevant and recent literature, that is between 2013 and 2017: EBSCOhost; Pro Quest; Google Scholar; CINAHL; Pubmed and Sabinet. The literature search included scholarly journals, articles, dictionaries, books, theses and dissertations related to research capacity and research-capacity development needs. The contextual natures of these concepts were furthermore framed within both international and national literature with a narrowed focus on health science, nursing and nurse education. These databases were searched with the following keywords “research*” combined with “capability” and/or “capacity”, and/or “capacity development” and/or “needs” and/or “nurs*” or “academic*” and/or “nurse educator*” and/or “nursing college” and/or “higher education”.

2.3 Discussion and flow of the underpinning concepts in the study

The core aspects explored and discussed (see Figure 2.1) in order to identify and describe research capacity and research-capacity needs of nurse educators at nursing education institutions are: the national transition of nurse training to higher education, the impact of the transition on the role of the nurse educator, and the research capacity of nurse educators.

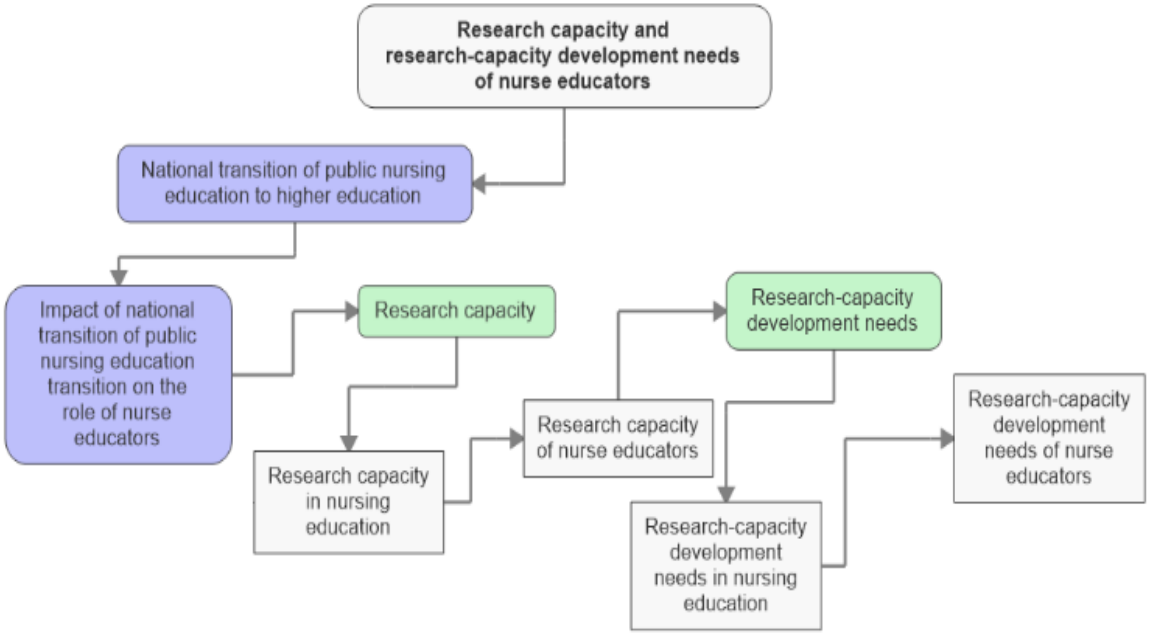

Figure 2-1: Flowchart of the underpinning concepts covered in the literature review

2.3.1 National transition of public nursing education to higher education

In South Africa, the transformation of nursing education is viewed and pursued as one of the most important strategies for enhancing the current workforce's performance, and thereby improving the overall functioning of the health system (Department of Health, 2013:14). Globally, a predominant trend in the transformation of nursing education is towards greater professionalism, with a university-based education as opposed to a hospital-based education (McDermid *et al.*, 2013:46). South Africa shows a similar, yet more formalised, trend through policy and legislative changes as prescribed in the Higher Qualification Sub-Framework (CHE, 2014), forcing academic programmes and those institutions offering them to align and accredit these programmes and the institutions to higher education status (Blaauw *et al.,* 2014:2; SANC, 2016).

Currently, the nursing colleges are under the jurisdiction of the Department of Health, implying that these colleges are not registered as HEIs (Roets & Lubbe, 2014:4). Provincial nursing colleges in South Africa that offer higher education legacy programmes have agreements with HEIs like universities to provide oversight and mentoring on the quality and standards of their education and training (Seekoe, 2014:2). The phasing out of legacy qualifications on 31 December 2019 (DHET, 2016:1) implies the termination of long-standing agreements and collaborations between provincial nursing colleges and HEIs. In short, nursing colleges will no

longer be able to offer legacy qualifications, and by 2020 these colleges must be accredited as HEIs (SANC, 2016:2) to offer new nursing programmes.

This national transformation process, though positive in both approach and impact, poses numerous challenges and hurdles for the current national nursing education system (Blaauw *et al.,* 2014:2; Roets & Lubbe, 2014:4; Van Rensburg *et. al.*, 2017:9). One of the challenges facing the provincial nursing colleges is that the SANC was the custodian body that regulated undergraduate nursing training and qualifications offered by these nursing colleges. However, the transformation means that nursing training standards and endorsement of qualifications have to comply with the broader Department of Education policy framework (Seekoe, 2014:2). These changes will inevitably have a significant impact on the role of the nurse educators who are currently teaching at the provincial nursing colleges (Roets & Lubbe, 2014:5)

2.3.2 The impact of national public nursing education transition on the role of the nurse educator

The Higher Education Act (101 of 1997) defines an academic employee as any person appointed to teach and to be engaged in research at a public HEI, and any other employee designated as such by the council of that institution. Thus being an academic in an HEI usually implies both a teaching and research role for the academic (in this case, a nursing academic). (Seekoe, 2013:119).

The envisaged transformation means extensive re-modelling of these institutions concerning teaching and research activities, to meet the requirements of the Higher Education Act 101 of 1997 as amended. Nurse educators employed by nursing colleges will have to adapt and engage in scholarly research, research teaching, and knowledge-dissemination activities - as well as research-capacity development - to comply with the requirements of the Higher Education Act 101 of 1997. Participating in research activities will enable these nurse educators to ultimately meet the evolving expectations of a university research culture (McDermid *et al.,* 2016:30; Quimbo & Sulabo, 2014:1956). However, international literature demonstrates that the transition to HEIs has not been easy for educators moving from nursing colleges to a university (Ayandiran *et al*., 2013:4, Seekoe, 2013:118; McDermid *et al*., 2013:47). These studies highlighted a lack of preparation for the role, and issues relating to academic status and relationships with other members of the academic community (Duffy, 2013:620)

Discussing challenges associated with the adaptive and transformative role of the nurse educators, Quimbo and Sulabo (2014:1956) argue the need for an in-depth research-capacity survey to identify the research capacity and research-capacity needs of nurse educators in HEIs.

Interestingly, a recent study conducted on the research culture of nursing colleges by Roets and Lubbe (2014:7) highlighted “the improvement of research knowledge” as the most crucial need to be in addressed in nursing education - not only for students, but also for nurse educators and research supervisors. This finding is also supported by Van Rensburg *et al.* (2016:9) and Van Rensburg *et al.* (2017:11). These studies clearly emphasise not only a current research-capacity gap at provincial nursing colleges (Oprescu *et al*., 2017:165; Van Rensburg *et al.* 2017:11) but specifically a need for assessing and developing research capacity of nurse educators employed by these institutions (Hiscock *et al.*, 2014:478; Gullick & West, 2016:605).

In South Africa, the provincial nursing colleges are solely funded by provincial government; as most of the colleges fall under the jurisdiction of the Department of Health (DoH, 2013:36). The system of funding, in essence, implies a different performance management system, specifically for nurse educators employed at provincial nursing colleges (Seekoe, 2014:2). The nurse educator's key performance area in this system is teaching (Begley *et al.*, 2013:2) and research is not recognised as one of the key performance areas (Begley *et al.*, 2013:2; Seekoe, 2014:2). This criterion is endorsed by national legislation, which prescribes that pay progression and incentives of nurse educators at provincial colleges must be based on their teaching experience and performance (PSA, 2007:36).

On the other hand, the HEIs have different criteria for promotion of academic staff. Academic staff are not only expected to teach, but they are also expected to engage in scholarly research (Adcroft & Taylor, 2013:829). They are expected to publish in recognised journals and present papers at conferences (Quimbo & Sulabo, 2014:1957), to ensure measurable research outputs (Smeltzer *et al.,* 2014:271); and have done so for numerous years in an organisational research culture supporting these activities (Quimbo & Sulabo, 2014:1956). This culture is foreign to nursing colleges. This will be achieved only by understanding current research capacity and the research-capacity development needs of the colleges and staff.

2.3.3 Research capacity

The literature review in supporting the overall aim of the study focused on gaining a deeper understanding of research capacity, specifically that of nurse educators.

Capacity is defined as “the actual ability to perform, yield or withstand” (Duffy *et al.,* 2015:159). According to the APA Dictionary of Psychology (2015:156), capacity is “the maximum ability of an individual to receive or retain information and knowledge or to function in the mental or physical task”. Capacity is closely related to capability, which is described as an intrinsic aspect (Visser-Winjnveen *et al*., 2012:422), namely ability (APA, 2015:156) or strictly speaking “perceived

abilities" (Visser-Winjnveen *et al*., 2012:422) and an able quality or talent (APA, 2015:156) that an individual uses in performing specific tasks.

Segrott *et al*. (2006:640) define research capacity as the ability of an individual within a discipline or a professional group to undertake high-quality research. Research capacity encapsulates: a) the ability to learn (Frantz *et al.,* 2013:48), and b) to develop and execute a specific skill (Uys & Klopper, 2014:1909) necessary to engage in research activities that result in successful information benefitting individuals (Buchholz, 2015: 665; Gullick & West, 2016:614; Squires *et al.*, 2017:2) - and ultimately the institution and society at large.

The ability to conduct research entails knowledge of common research language and skills (Gullick & West, 2016:609; McCance *et al*., 2007:58), attitude toward research (Levine *et al.,* 2013:2), and confidence to undertake research (Edward, 2015:120). The ability to undertake research is viewed as a necessary precursor to productivity, but requiring specific skills, a culture of collaboration and sustainable pathways for researching in a busy clinical or educational environment (Gullick & West, 2016:606; Watson *et al.,* 2005:1043).

The research capacity of nurse educators will be further described through the following concepts, each with its heading: a) research capacity within nursing education, b) research capacity of nurse educators and c) research-capacity development needs in nursing education and research-development needs of nurse educators (Figure 2.1).

2.3.3.1 Research capacity within nursing education

Florence Nightingale initiated nursing research more than 150 years ago (Grove *et al*., 2013:17) and emphasised the necessity for nursing education and nursing research to produce the body of knowledge that would underpin nursing as an independent profession (Kalb *et al.*, 2015:212). To date, the scholarship of nursing education is viewed as pivotal in informing practice; facilitating change and making the difference to the health and well-being of humanity through conducting quality nursing research and teaching (Cash & Tate, 2012; SANC, 2014:6; WHO, 2016:12). There is no doubt that nursing research is a cornerstone of nursing science, which is fundamental to effective nursing practice (Uys *et al.*, 2013:1) - and that nursing education lies at the heart of sustaining evidence-based practice (Duffy *et al.*, 2015:158; Kruss *et al.*, 2016:755) and transforming the science of nursing education (Broome *et al*., 2012:521).

Internationally, research capacity in higher education is regarded as an essential capability of an HEI to produce knowledge and a sound evidence base for decision-making to develop skills, drive innovation and help enhance economic growth (Kruss *et al.*, 2016:755; Masike *et al.*, 2014:52). In the South African context, this function of HEIs is contemplated in the Research Output Policy,

which enforces research productivity by rewarding quality research output at HEIs (DHET, 2015:4; Luruli & Mouton, 2016:1). This policy recognises (and rewards, through subsidy) research published in accredited journals, books and conference presentations (DHET, 2015:5; Quimbo & Sulabo, 2014:1957) which must meet the policy's set criteria. While receiving the government subsidy for teaching output (Altbach, 2014:1313), HEIs also rely on research output as a primary revenue stream (Smeltzer *et al.*, 2014:271). The quantity and quality of measurable research output also determines the status and credibility of HEIs (Gething & Leelarthaepin, 2000:148). Research output is one of the criteria that nursing colleges must be prepared to achieve soon, as they migrate to being HEIs (CHE, 2007:22).

In nursing education, a scholarly culture that enables and supports creative work offers ongoing and diverse development learning activities, affords adequate resources, and provides nurse educators with opportunities to interact and participate in research (Roets & Lubbe, 2014:3). The HEIs need to invest in infrastructure to improve nurse educators' performance and enhance their quality of work life (Frantz *et al.*, 2013:48). Increasing research capacity in HEIs is vital for generating research output and identifying research priorities relevant to nursing education and practice (McMaster *et al*., 2013:155).

The National Plan for Higher Education (2001) points out that HEIs have a crucial role to play in producing knowledge, which is vital for economic growth and development of the country (CHE, 2018:2). Therefore, the HEIs are tasked with producing competent graduates and postgraduates. The quality output will be achievable only if academic nursing staff have appropriate research qualifications and experience to supervise students (Van Rensburg *et al.*, 2016:4). Therefore, the HEIs' research capacity plays an essential role in the strengthening of evidence-based healthcare practice and achieving goals that are set in the national policies (Sheehan *et al.*, 2015:14), thus ensuring alignment between research and practice (Severinsson, 2012:142).

Research capacity in nursing education is viewed as a capability of the HEI to undertake quality research, measured by the ability of nurse educators to use evidence-based practice and publish in accredited journals (Gething & Leelarthaepin, 2000:148; McAllister & Flynn, 2016:122). To achieve this objective, the nurse educators must possess a range of academic writing, scientific language and IT skills (Oprescu *et al.*; 2017:167).

2.3.3.2 Research capacity of nurse educators

Excellence in nursing education does not involve only competent teaching but also requires vision, curiosity and commitment to research, for the continual improvement of nursing science (McAllister & Flynn, 2016:122). Participation in research has been identified internationally and

nationally as one of the core competencies of nurse educators that would enable the nurse educator to contribute to high-quality nursing education (WHO, 2016:5; SANC, 2014:6). Therefore, the nurse educators, regardless of work context, are all nursing scholars engaged in knowledge dissemination, critique and building of new knowledge - either by themselves as researchers and innovators, or by encouraging students to become researchers (McAllister & Flynn, 2016:122; Oprescu *et al.*; 2017:167). To have a successful and productive career, over and above teaching, they need to incorporate research and professional development in their daily work (Oprescu *et al.*, 2017:167; Seekoe, 2015:59). Thus, research productivity is an expected domain in the prescribed competencies of nurse educators, and the establishment of research capacity precedes productivity. Consequently, it is crucial to identify research capacity for nurse educators as they are expected to maintain research output. Robust research capacity is the foundation of research productivity (Gullick & West, 2016:605).

Several authors emphasise that the three main aspects essential for the research capacity of an individual, are: 1) academic qualifications (Melnyk *et al.,* 2012:412), 2) research skills (Roets & Bhembe, 2016:218), and 3) general research knowledge (Gullick & West, 2016:609).

Arguably, and in line with the discussion above, the key to research performance lies within an academic qualification. In the international nursing and capacity-building literature, graduate and postgraduate training is a key way in which research capacity is built and through which nurses can develop the knowledge and skills to engage in research, compete for funding, and implement evidence-informed practice (Sheehan *et al.,* 2015:16). Thus, an academic qualification within the nursing education landscape is viewed as an essential factor to enhance research productivity, leading to improved research capacity (Uys & Klopper, 2014:1910). Therefore, it is an investment to enable nurse educators to pursue further academic qualifications, especially in research-based higher degrees (Cooke & Green, 2000:59). Melnyk *et al*. (2012:412) support this notion through their research findings, which revealed that nurse educators who had Master's degrees experienced higher levels of confidence in their preparation for research and that those with PhDs proved to be more productive in research.

Nurse educators are expected to integrate research findings in their teaching (Felicia- Reynado, 2015:94; Frantz *et al.*, 2013:49) to produce graduates who can use research to inform practice. Therefore, the future of healthcare provision is dependent on the existence of expert nurses who are well trained to oversee the curative, preventative, and health-promotion priorities central to recent health policy (Department of Health, 2013:35). Thus, understanding of the ordinary knowledge of research language is one dimension of research capacity that ensures a common understanding among nurse educators and facilitates efficient utilisation of research findings (Duffy *et al.,* 2015:158). The knowledge of common research language enables nurse educators

to access practical research knowledge, thus decreasing the barriers to daily use of research findings (Gullick & West, 2016:609).

In addition to research knowledge, studies show that efficient research skills increase the research activity and enhance positive attitudes towards research (Cooke & Green, 2000:59; Lode *et al*., 2015:665). Research skill is a means which enables research to be conducted; allows the dissemination of knowledge; enables future funding to be obtained; and ultimately results in practices that improve health (Levine *et al*., 2013:3). These research skills translate to nurse educators' ability to present research papers in published conference proceedings (Quimbo & Sulabo, 2014:1957). In addition to the presentation of articles, nurse educators are expected to publish articles in accredited journals - an expected competency of nurse educators in all HEIs (Quimbo & Sulabo, 2014:1957). These research-output activities are intended for nurse educators to gain recognition nationally and internationally, and also to enhance the credibility of their institutions (Gething & Leelarthaepin, 2000:148).

Based on the discussion above, research capacity in nursing education translates to the ability of the nurse educator to understand, conduct, use, develop and sustain research and research activities in the current higher education environment of South Africa.

2.3.4 Research-capacity development needs

A development need is a performance gap separating what an individual knows, does or feels from what they should know, do or feel to perform competently (Rothwell and Kazanas, as cited by Opperman and Meyer (2008:35). The assessment of the development need should always be linked to the essential knowledge; skills and attitudes that an individual must possess to perform his/her work competently and thereby accomplish the desired results (Opperman & Meyer, 2008:35). In the context of this study, research-capacity development needs are the knowledge, skills and abilities that need to be developed to conduct quality and useful research in nursing education. This section will discuss the research-capacity development needs within nursing education and those of nurse educators.

2.3.4.1 Research-capacity development needs in nursing education

The need to develop research capacity in nursing education in South Africa is not unique; it is a global challenge (Sheehan *et al.,* 2015:13). In cognizance of these issues, the South African Department of Health has prioritised the strengthening of research and research development in the nine priorities that highlight the critical requirement to achieve a more-effective health system in South Africa (Department of Health, 2014:14).

There is ongoing concern that there are few nurses who have PhD qualifications, leading to lack of skills and also a focus on PhD studies (while balancing workloads) instead of conducting research (Frantz *et al.,* 2014:1217). This is a continuous problem in South Africa, as the SANTRUST African statistics show an unacceptable completion rate. South Africa is producing only 23 PhDs per year, per million of the population - and the report further highlights that out of 971 Master's-degree students registered for a nursing-research programme in 2010, only 121 (12.5%) completed in 2011 (Sheehan *et al.,* 2015:15). There is acknowledgement that nurses are generally underprepared to take on higher level education, although the higher degree qualification is perceived as the foundation for research engagement (Sheehan *et al.*, 2015:13). The shortage of nurse educators with qualifications to conduct research compromises the research output of HEIs, which has an adverse effect on the image and credibility of those institutions (Gething & Leelarthaepin, 2000:148).

In addition to the need for a postgraduate qualification, nurse educators also need to engage in continuous professional development (SANC, 2014:6) to continuously update their research skills and contribute meaningfully to the expected research output. Therefore, the nurse educators need to attend research workshops that are relevant to their research-skill needs (Oprescu *et al.*; 2017:167). However, because of limited funds, some HEIs are unable to fund research capacity-building activities (Van Rensburg et al. 2017:9) and, as a result, some academics cannot keep abreast with research knowledge.

In general, work barriers have been highlighted as crucial contributors to research-capacity development needs (Asuquo *et al.,* 2013:48; Roets & Bhembe, 2016:222; Segrott *et al.,* 2006:646; Uys & Klopper, 2014:1911). These work barriers limit the individual's research capacity and thus have a massive impact on the research output of the institution. These studies also revealed that nurse educators need protected time for upgrading their qualifications so that they can participate meaningfully in research activities. The nurse educators in HEIs have heavy teaching loads, demands of administrative and clinical functions, involvement in professional organizations, and growth in student numbers, without adequate staff complements (Griffioen *et al*.,2013:26, MacIntyre *et al*., 2013:687; Roets & Bhembe, 2016:221). At nursing colleges, value is placed on teaching or on clinical skills - and not as much value is placed on research skills. Therefore, time spent on research is not rewarded (Uys & Klopper, 2014:1911).

The lack of funding is also viewed as a challenge for researchers to engage meaningfully in research activities (Hiscock *et al*., 2014:480). It also leads to poor infrastructure, which is often the primary challenge (Uys & Klopper, 2014:1913). This is a significant challenge at nursing colleges falling under the Department of Health, as the demands of the health service are prioritised over research funding for educational institutions (Uys & Klopper, 2014:1913).

Infrastructure shortages are mainly internet access and well-resourced libraries (Segrott *et al*., 2006:640 & Phelan *et al.,* 2015:271). These resources are basic research needs that enable individual academics to access literature, which is a fundamental step in conducting research.

It is evident that while research is crucial in advanced nursing practice like nursing education, internationally and nationally the demand remains unmet (Gullick & West, 2016:606). Failure to meet research expectations is attributed to coexisting gaps in research preparation, infrastructure, and expectations in the organisation, as well as policy documents that do not necessarily translate into research activity (Gullick & West, 2016:606).

2.3.4.2 Research-capacity development needs of nurse educators

Nursing education in South Africa is experiencing a deficit in the research capacity needed to meet the future national health-care demands (Sheehan *et al.*, 2015:13). Research-capacity programmes need to be developed to bridge this gap (Van Rensburg *et al.*, 2017:2). However, Corchon *et al.* (2011:2481) emphasised that 'it is pertinent to consider the context when identifying the research-capacity needs. Taking into consideration the context might help to address not only individual issues, or the research capability of nurse educators, but also other general factors that are perceived by nurse educators as research barriers (Howard *et al.,* 2013:181). An understanding of the research-capacity needs of nurse educators is especially needed for designing strategies or implementing interventions in nursing colleges (Corchon *et al.*, 2011:2481; Oprescu *et al*., 2017:165) as these colleges prepare to transit to higher education. The changing role and expectations when nurse educators move into higher education pose challenges, as these nurse educators lack confidence, research experience and qualifications (Ayandiran *et al*., 2013:4; McDermid *et al*., 2013:47; Seekoe, 2013:118).

Studies have shown that most nurses do not feel confident in undertaking research (Arkejoret *et al.,* 2012a:815; Gething *et al.,* 2001:228) and this is also true for nurse educators (Oprescu *et al.,* 2017:166; Van Rensburg *et al.,* 2017:9*)*. This leads to less participation in research-related activities, as confidence in one's ability to engage in research is identified as one of the positive predictors for undertaking research (*Arkejoret et al.*, 2012a:815; Gething *et al*., 2001:228; Oprescu *et al.*, 2017:166; Wyllie *et al.,* 2016:216). There could be several factors contributing to a lack of confidence (Watson *et al.,* 2005:104 & Wyllie *et al*., 2016:216). Amongst others, education, research skill and adequate resources are highlighted as essential factors for boosting confidence for undertaking research (Duffy *et al.,* 2015:159).

For nurse educators to be competent in the research domain, they need to possess relevant post-basic qualifications (Van Rensburg *et al.*, 2017:9). However, most of the nurse educators at

nursing colleges do not have Master's and PhD qualifications (Roets & Bhembe, 2016:212). Corchon et al., (2011:2485) point out that the nurse educators teaching the basic diploma courses are not obliged to obtain Master's or doctoral qualifications. The lack of higher-degree qualifications in nursing education is also a challenge in the South African context, as the SANC's pre-registration requirement for a nurse educator is a diploma or a degree qualification in nursing education. Nurse educators were expected to have a qualification that is just higher than the programme they are teaching (SANC, 1994:22). Therefore, in the new dispensation, most of the nurse educators will be forced to further their studies and to develop fundamental research skills (McDermid *et al*., 2016:30).

Some nurse educators at nursing colleges do have Master's and PhD qualifications in nursing education and can manage research (Van Rensburg *et al.*, 2017:9). However, there is no evidence that those with research skills and qualifications are engaging in research (Van Rensburg *et al.*, 2017:9) and the reason for this remains anecdotal (Hiscock *et al*., 2014:478). This underutilised research capacity represents an enormous waste of years of research training. Better utilisation of this capacity should be a principal aim of strategic planning and capacity building (Hiscock *et al*., 2014:482).

Nurse educators require knowledge of common research language to engage meaningfully in research activities (Duffy *et al.*, 2015:159). Understanding research language entails mastering research process, which includes identifying the researchable problem, literature review evidence, design phase, preparation for action, action phase, data analysis phase and writing-up phase (Gething *et al*., 2001:228). Studies conducted on the research capacity of nurse educators demonstrate that nurse educators do not feel confident in undertaking all the research steps (Oprescu *et al.*, 2017:166; Wyllie *et al.,* 2016:216). This trend is supported by a study conducted by Squires *et al.* (2017:2), which revealed that nurse educators lack research skills - particularly in areas of research proposal development, statistical analysis, knowledge dissemination and accessing grants. Van Rensburg *et al.* (2017:10) revealed that, despite initiatives to improve the research capacity of nurse educators at nursing colleges, there had been no increase in publications and presentations at conferences.

HEIs can foster a research culture but they need nurse educators who know how to use evidence in their academic practice and who role-model this evidence-based practice in their teaching (Felicia-Reynado, 2015:94; Frantz *et al.*, 2013:49). A recent study conducted by Roets & Bhembe (2016:218) revealed that nurse educators who were transferred to HEIs felt that they lacked research experience and competency to teach research methodology and supervise the students on research-related activities. These nurse educators highlighted lack of time, lack of policies, lack of support from management, lack of physical resources and inadequate human resources

as significant factors that adversely affected their research development (Roets & Bhembe, 2016:215). This is congruent with the findings of other studies conducted on research capacity (Squires *et al.,* 2017:5).

The academic research-capacity needs have to be addressed to enable the academics or nurse educators to participate in research - as failure to provide these basic research-capacity needs may hinder the nurse educators in participating efficiently in research activities (Uys & Klopper, 2014:1911). If the Gauteng Department of Health is to support the development of research capacity of nurse educators, it will need an understanding of current research-capacity needs (Duffy, 2013:620; McAllister & Flynn, 2016:123; Van Rensburg *et al*., 2016:12; Wyllie *et al*., 2016:213).

2.4 Summary

A literature review was conducted to describe the research capacity and research-capacity needs of nurse educators at provincial nursing colleges.

To summarise the above, the transition of nursing colleges to HEIs will have a significant impact on the role of the nurse educators currently teaching at nursing colleges (Roets & Lubbe, 2014:5). When nursing colleges gain HEI status, nurse educators will be compelled to possess research skills, particularly in the areas of accessing, evaluating, critiquing the evidence, and publication (Van Rensburg *et al.* (2017:10). While research productivity is vital in the higher education environment, internationally this remains mostly unmet - particularly in lower and middle-income countries (Gullick & West, 2016:605; Sheehan *et al.*, 2015:13). The reasons are numerous, but the main one is that at provincial nursing colleges, the job descriptions and policy documents do not necessarily translate into research productivity (Seekoe, 2014:2; Gullick & West, 2016:605). Current literature also emphasises that research capacity precedes productivity and, consequently, there is a strong imperative to identify the research-capacity needs of academics in higher education and to provide a training environment to enhance research productivity. The research-capacity needs highlighted by current literature include the need to improve the postgraduate qualifications of staff; to develop necessary research skills; exposure to quality research infrastructure; providing protected time to conduct research; and allocating funds for research activities (Frantz *et al.*, 2014:1223). The HEIs need to identify these needs and put in place mechanisms to address shortfalls. Corchon *et al.* (2011:2481) highlight the fact that interventions to improve nurse educators' capacity were usually based on theory (academic studies), regardless of the contexts where they were being implemented, and this might be the reason why they did not achieve the expected outcomes.

In the next chapter, an article prepared for the Health SA Gesondheid Journal of Interdisciplinary Health Sciences is presented. This article includes a shortened version of the literature review, the study aims, method, results and conclusion.

CHAPTER 3: ARTICLE

3.1 Author information pack: Health SA Gesondheid

Overview

The author guidelines include information about the types of articles received for publication and preparing a manuscript for submission. Other relevant information about the journal's policies and the reviewing process can be found under the about section. The **compulsory cover letter** form part of a submission and is on the first page of the manuscript. It should always be presented in English. **See full structure of cover letter below.** After the cover letter the manuscript body starts.

Original Research Article

An original article provides an overview of innovative research in a particular field within or related to the focus and scope of the journal, presented according to a clear and well-structured format. **See full structure of original research articles below.**

Word limit	5000 words (excluding the structured abstract and references)
Structured abstract	250 words to include a Background, Aim, Setting, Methods, Results and Conclusions
References	40 or less
Tables/Figures	no more than 7 Tables/Figure
Ethical statement	should be included in the manuscript

A **systematic review** follows the same basic structure as an original research article:

- Structured abstract: Background, aim, setting, methods, results, conclusion.
- Aim and objectives: Focus on a clinical question that will be addressed in the review.
- Methods section: Describe in detail the search strategy, criteria used to select or reject articles, attempts made to obtain all important and relevant studies and deal with publication bias (including grey and unpublished literature), how the quality of included studies was appraised, the methodology used to extract and/or analyse data.
- Results: Describe the homogeneity of the different findings; clearly present the overall results and any meta-analysis.

Cover Letter

The format of the compulsory cover letter forms part of your submission. It is located on the first page of your manuscript and should always be presented in English. You should provide the following elements:

- Full title: Specific, descriptive, concise, and comprehensible to readers outside the field, max 95 characters (including spaces).
- Tweet for the journal Twitter profile: This will be used on the journal Twitter profile to promote your published article. Max 101 characters (including spaces). If you have a Twitter profile, please provide us your Twitter @ name. We will tag you to the Tweet
- Full author details: The title(s), full name(s), position(s), affiliation(s) and contact details (postal address, email, telephone, highest academic degree, Open Researcher and Contributor Identification (ORCID) and cell phone number) of each author.
- Corresponding author: Identify to whom all correspondence should be addressed.
- Authors' contributions: Briefly summarise the nature of the contribution made by each of the authors listed.
- Disclaimer: A statement that the views expressed in the submitted article are his or her own and not an official position of the institution or funder.
- Source(s) of support: These include grants, equipment, drugs, and/or other support that facilitated conduct of the work described in the article or the writing of the article itself.

- Summary: Lastly, a list containing the number of words, pages, tables, figures and/or other supplementary material should accompany the submission.

Anyone that has made a significant contribution to the research and the paper must be listed as an author in your cover letter. Contributions that fall short of meeting the criteria as stipulated in our policy should rather be mentioned in the 'Acknowledgements' section of the manuscript.
Read our **authorship** guidelines and **author contribution** statement policies.

Original Research Article full structure

Title: The article's full title should contain a maximum of 95 characters (including spaces).

Abstract: The abstract, written in English, should be no longer than 250 words and must be written in the past tense. The abstract should give a succinct account of the objectives, methods, results and significance of the matter. The structured abstract for an Original Research article should consist of six paragraphs labelled Background, Aim, Setting, Methods, Results and Conclusion.

- Background: Summarise the social value (importance, relevance) and scientific value (knowledge gap) that your study addresses.
- Aim: State the overall aim of the study.
- Setting: State the setting for the study.
- Methods: Clearly express the basic design of the study, and name or briefly describe the methods used without going into excessive detail.
- Results: State the main findings.
- Conclusion: State your conclusion and any key implications or recommendations.
- Do not cite references and do not use abbreviations excessively in the abstract.

Introduction: The introduction must contain your argument for the social and scientific value of the study, as well as the aim and objectives:

- Social value: The first part of the introduction should make a clear and logical argument for the importance or relevance of the study. Your argument should be supported by use of evidence from the literature.
- Scientific value: The second part of the introduction should make a clear and logical argument for the originality of the study. This should include a summary of what is already known about the research question or specific topic, and should clarify the knowledge gap that this study will address. Your argument should be supported by use of evidence from the literature.
- Conceptual framework: In some research articles it will also be important to describe the underlying theoretical basis for the research and how these theories are linked together in a conceptual framework. The theoretical evidence used to construct the conceptual framework should be referenced from the literature.
- Aim and objectives: The introduction should conclude with a clear summary of the aim and objectives of this study.

Research methods and design: This must address the following:

- Study design: An outline of the type of study design.
- Setting: A description of the setting for the study; for example, the type of community from which the participants came or the nature of the health system and services in which the study is conducted.
- Study population and sampling strategy: Describe the study population and any inclusion or exclusion criteria. Describe the intended sample size and your sample size calculation or justification. Describe the sampling strategy used. Describe in practical terms how this was implemented.
- Intervention (if appropriate): If there were intervention and comparison groups, describe the intervention in detail and what happened to the comparison groups.
- Data collection: Define the data collection tools that were used and their validity. Describe in practical terms how data were collected and any key issues involved, e.g. language barriers.

- Data analysis: Describe how data were captured, checked and cleaned. Describe the analysis process, for example, the statistical tests used orsteps followed in qualitative data analysis.
- Ethical considerations: Approval must have been obtained for all studies from the author's institution or other relevant ethics committee and the institution's name and permit numbers should be stated here.
- Results: Present the results of your study in a logical sequence that addresses the aim and objectives of your study. Use tables and figures as required to present your findings. Use quotations as required to establish your interpretation of qualitative data. All units should conform to the SI convention and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Discussion: The discussion section should address the following four elements:

- Key findings: Summarise the key findings without reiterating details of the results.
- Discussion of key findings: Explain how the key findings relate to previous research or to existing knowledge, practice or policy.
- Strengths and limitations: Describe the strengths and limitations of your methods and what the reader should take into account when interpreting your results.
- Implications or recommendations: State the implications of your study or recommendations for future research (questions that remain unanswered), policy or practice. Make sure that the recommendations flow directly from your findings.

Conclusion: Provide a brief conclusion that summarises the results and their meaning or significance in relation to each objective of the study.

Acknowledgements: Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution. Authors are responsible for ensuring that anyone named in the Acknowledgments agrees to be named.
Also provide the following, each under their own heading:

- Competing interests: This section should list specific competing interests associated with any of the authors. If authors declare that no competing interests exist, the article will include a statement to this effect: *The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.* Read our **policy on competing interests**.
- Author contributions: All authors must meet the criteria for **authorship** as outlined in the authorship policy and **author contribution** statement policies.
- Funding: Provide information on funding if relevant
- Disclaimer: A statement that the views expressed in the submitted article are his or her own and not an official position of the institution or funder.

References: Authors should provide direct references to original research sources whenever possible. References should not be used by authors, editors, or peer reviewers to promote self-interests. Refer to the journal referencing style downloadable on our *Formatting Requirements* page.

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Language usage

General elements

- **Quotations:** Use single quotation marks for quotations. For quotations within quotations, use double quotation marks. Quotations of more than 30 words are to be indented. Do not use quotation marks for indented quotations unless it is direct speech (e.g. interviewee responses).
- **En dashes and hyphens:** Use an en dash (i.e. extended hyphen that can be found in the Insert box under Symbols in Microsoft Word) in ranges of numbers and dates. Use hyphens only for words that are hyphenated.
- **Dates:** Format dates as '02 October 2006', except at the beginning of sentences where numerals and dates should either be spelt out or the sentence should be rearranged.
- **Percentage:** The per cent symbol (%) is used in conjunction with all numbers (e.g. 12%). Numbers that have been written out will appear with 'percent' (e.g. five percent). 'Percentage' is used in a general sense.
- **Numbers:** Numbers from one to nine must be written out. Numbers from 10 onwards, must be used as numerals, except at the beginning of a sentence.
- **Spacing and punctuation:** There should be one space (and not two) between sentences; one space before unit terms (e.g. 5 kg, 5 cm, 5 mmol, 5 days, 5 °C, etc.), but no space before the percentage symbol (%). Thousands and millions are marked with a space and *not* a comma (e.g. 1000, 1 000 000). Ranges are expressed with an extended hyphen (i.e. en dash), not with a short hyphen (e.g. 1990–2000).
- **Units:** The use of units should conform to the SI convention and be abbreviated accordingly. Metric units and their international symbols are used throughout, as in the decimal point (not the decimal comma), and the 24-hour clock.
- **Foreign language:** Foreign language words should be italicised, unless these words are part of normal usage. Consult the Oxford English Dictionary if in doubt.
- **Acronyms:** If a phrase with an established acronym or abbreviation is used and appears more than five times in your manuscript, please include the acronym or abbreviation in brackets after first mention of the phrase, and then use the acronym or abbreviation only. Please note that you should not define acronyms or abbreviations in any of your headings. If either has been used in your abstract, you need to define them again on their first usage in the main text.

Sensitive and political terms

- **Race and ethnicity:** Try to avoid terms such as 'blacks' and 'whites'; use instead 'black *people*', 'white *people*', etc. 'Caucasian', 'Mongoloid', 'Negroid', etc. are generally to be avoided except in human population studies. 'Mixed race' is preferable to 'half-caste' or 'coloured'.
- **Disabilities:** Avoid using 'the disabled', 'the handicapped', and instead use 'people with disabilities not 'the disabled' or 'people with learning difficulties', not 'mentally handicapped'.
- Disease
    - Avoid health-determined categorisation.
        - Use 'people with diabetes'; not 'diabetics'.
        - Use 'people with cancer'; not 'cancer sufferers'.

    - Use 'sexually transmitted infection (STI)' and not 'sexually transmitted disease (STD)'.
  - Avoid phrasing that dehumanises a patient. Many authors use case (instance of a disease) when they mean patient (i.e. the person or individual who is ill with the (disease).
- **AIDS**
  - Ensure that 'AIDS' is used for the disease and 'HIV' for the virus, e.g. do not use 'AIDS carrier', 'AIDS positive', 'AIDS virus' or 'catching AIDS or HIV/AIDS' (avoid using the solidus here).
  - 'AIDS sufferer/victim' is inappropriate; use 'people with AIDS'.
  - Refer to 'people who practise high-risk activities' and not '*high-risk groups*'.
  - The expression 'full-blown AIDS' is unnecessary if the correct distinction has been made between HIV and AIDS.
- **Male versus Female**
  - 'Male' and 'female' are *adjectives*, so be careful to use them as such (i.e. a *male* patient and a *female* frog, but a 35-year-old *man*, a French *woman* and a group of 25 *men* and 35 *women*).
- **Sexuality**: Avoid the terms '*homosexual activities*' (if achievable within the manuscript's context, specify which activity is being referred to, especially when dealing with medical research.) Avoid using '*homosexuals*' (specify homosexual men or homosexual women).
- **Gender**: Use gender neutral nouns. Avoid the use of 'man' if not specifically referring to men; for example:
  - for 'man' use 'humans'
  - for 'man-kind' use 'the human race'
  - for 'man-power' use 'workforce'
  - for 'man-made fibre' use 'synthetic fibre'
- **'He/she', 'him/her' and 'his/hers'**: For 'he/she', 'him/her' and 'his/hers' rather use 'he or she', 'her or him', 'his or hers' (without a solidus) or change to plural 'they'. Use inclusive pronouns: use 'he or she', or rephrase the sentence (rephrasing to the plural form often works):

✗ ... *Any observer* of changes in publishing technology will perceive that *he* has need of...

✓ ... ***Observers*** of... will perceive that *they* have...

Beware of referring to people with stereotypical pronouns (e.g. 'the doctor treated *his* patient'; 'the secretary tidied *her* desk').

- **Geography**
  - The terms *Third World, poor countries* and *underdeveloped countries* should be avoided.
  - *Developing* or *non-developed country/society* is better, but it is best to specify countries or regions instead.
  - *Western society* and *Western World* should only be used in relation to geography; otherwise, use *developed world/society* or, even better, specify the countries themselves or the region.

Tables, figures and photographs

Tables should in an Excel (.xls) format. Ensure that all personal identifying information is removed from the supplementary files as indicated in the provided instructions. All captions should be provided together on a separate page. Tables and figures should use numerical numbers.

- **Organise your visual presentation**: Once you have read through the analyses and decided how best to present each table or figure, think about how you will arrange them within the manuscript. The analyses should tell a story' that leads the reader through the steps needed to logically answer the question(s) that you as author are posing in the Introduction. The order in which you present the results can be as important in convincing the readers as what you actually are saying in the text.
- **How to refer to tables and figures in the text:** Every figure and table included in the paper *must* be referred to in the body of the text. Use sentences that draw the reader's attention to the relationship or trend you wish to highlight, referring to the appropriate figure or table only in parenthesis e.g.:
    - Germination rates were significantly higher after 24 h in running water than in controls (Figure 4).
    - DNA sequence homologies for the purple gene from the four congeners (Table 1) show high similarity, differing by at most 4 base pairs. (Avoid sentences that give no information other than directing the reader to the figure or table, e.g. Table 1 shows the summary results for male and female heights at Bates College.)
- **Abbreviation of the word 'Figure':** When referring to a figure in the text, the word 'figure' is never abbreviated as 'Fig.'; the same rule applies to the usage of 'table'. Both words are spelled out completely in descriptive legends.
- **How to number tables and figures:** Figures and tables are numbered independently, in the sequence in which you refer to them in the text, starting with Figure 1 and Table 1. If, in revision, you change the presentation sequence of the figures and tables, you must renumber them to reflect the new sequence.
- **The acid test for tables and figures:** Any table or figure you present must be clear, well-labelled, and described by its legend to be understood by your intended audience without reading the results section. That is, it must be able to stand alone and be interpretable. Overly complicated figures or tables may be difficult to understand in or out of context, so strive for simplicity whenever possible.
- **Descriptive legends or captions:** To pass the acid test above, a clear and complete legend (sometimes called a caption) is essential. Like the title of the manuscript itself, each legend should convey as much information as possible about what the table or figure intends to tell the reader:
    - the results that are being shown in the graph(s), including the summary statistics plotted
    - the organism studied in the experiment (if applicable)
    - a context for the results: the treatment applied or the relationship displayed, etc.
    - location (*only* if a field experiment)
    - specific explanatory information needed to interpret the results shown (in tables, this is frequently done as footnotes)
    - culture parameters or conditions if applicable (temperature, media, etc.)

- sample sizes and statistical test summaries, as they apply

Do not simply restate the axis labels with a 'versus' written in between.

Example: Figure 1: Height frequency (%) of White Pines (Pinusstrobus) in the Thorncrag Bird Sanctuary, Lewiston, Maine, before and after the Ice Storm of 1998. Before, n = 137, after, n = 133. Four trees fell during the storm and were excluded from the post-storm survey.

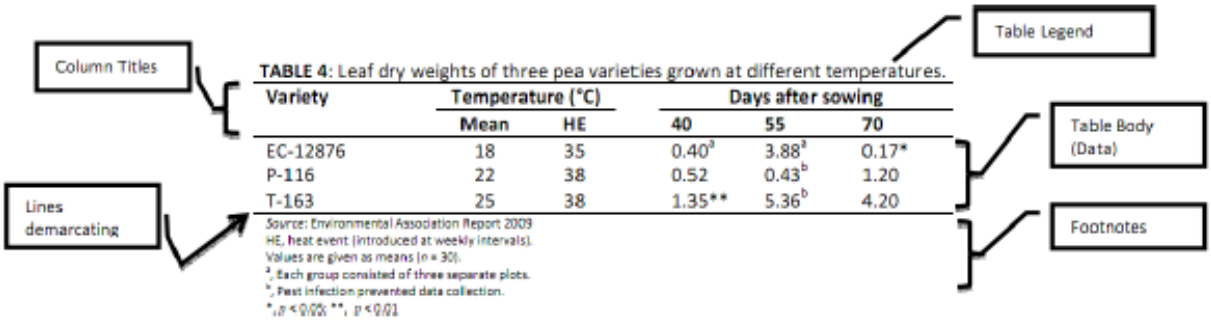

TABLE 4: Leaf dry weights of three pea varieties grown at different temperatures.

Variety	Temperature (°C)		Days after sowing		
	Mean	HE	40	55	70
EC-12876	18	35	0.40[a]	3.88[a]	0.17*
P-116	22	38	0.52	0.43[b]	1.20
T-163	25	38	1.35**	5.36[b]	4.20

Source: Environmental Association Report 2009
HE, heat event (introduced at weekly intervals).
Values are given as means (n = 30).
[a], Each group consisted of three separate plots.
[b], Pest infection prevented data collection.
*, $p < 0.05$; **, $p < 0.01$

Note: Questions frequently arise about how much methodology to include in the legend, and how much results reporting should be done. For laboratory reports, specific results should be reported in the results text with a reference to the applicable table or figure. Other than culture conditions, methods are similarly confined to the Methods section.

Footnotes to tables, figures and photographs

Do not introduce footnotes in the body of the manuscript. Footnotes should be used as follows:

- Copyright and permissions to reproduce should be clearly stated.
- Notes about the table as a whole can be left unlinked (i.e. no linking letters or numbers or symbols) or linked to, for example, a relevant column heading.
- Notes about specific parts of the table should be linked using superscript lower case letters (preferred), superscript numbers or symbols.
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- If an abbreviation is mentioned for the first time in a table (e.g. 'CE' in Table 1), it must be defined in a footnote to that table, (e.g. HE, Heat event (introduced at weekly intervals).
- Asterisk footnotes are reserved for probability values in tables and usually signify the following values: *, $p \leq 0.05$; **, $p \leq 0.01$; ***, $p \leq 0.001$. The asterisk is often used in mathematics and should therefore be avoided as a footnote symbol.
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- When superscript numbers or letters are used in text, beware of potential confusion with other superscripts (e.g. 2 for 'squared').
- Footnotes should be in the following order:

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- other general notes
- notes on specific parts of the table (following the order in the table itself)
- notes on level of probability

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Supply your manuscript creatives in one of the following three preferred formats:

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  - Colour or greyscale photographic images: 300dpi
  - Line art or combination images: 600/900dpi
  - We would recommend using this format for photographic images.
- **EPS**: An EPS is essentially an envelope for holding text and images. Line art can be produced as an EPS (in Illustrator, for example). There are virtually no limits to scaling line art saved as an EPS. It can also contain TIFF images. However, please ensure that all fonts are embedded (that is, saved as outlines) and that line weights are not defined as hairline.
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Other file formats

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- We cannot guarantee the quality of images supplied in other formats.

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- CyanMagentaYellowBlack are the base colours used during the printing process.
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- RedGreenBlue are the colours used by monitors and default scanner settings. Any colour that is to appear online must be in RGB mode.

Guidelines for Math

- Set display equations in MathType. Each display equation should be in its own MathType object. Each MathType object should contain the entire equation, including final punctuation. The equation number should be set as Microsoft Word regular text, outside the MathType object, separated by either a tab or a space.
- Set in-text (inline) math in Microsoft Word regular text. Exception: If in-text (inline) math has elements that should be stacked or have rules, circumflexes, arrows, or other accents spanning over more than one character, set in MathType as 'Inline Equation.'
- If any characters cannot be found in Word's Symbol palette ('(normal text),' 'Times New Roman,' or 'Symbol'), please set in MathType.
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- No numbered equations are allowed in table footnotes.
- Display and/or numbered equations ARE allowed in table body, but must be 'inline' when converted to MathML equations.

Fonts: Unicode fonts

Please use standard (UNIcode) fonts such as Palatino, Times New Roman, Helvetica and Symbol. Fonts that have not been embedded will usually be replaced by Courier, resulting in character loss or realignment.

Understanding Unicode

The explanation at Unicode.org is a good place to begin.

'Unicode provides a unique number for every character, no matter what the platform, no matter what the program, no matter what the language.' (Unicode.org, 2011)

Put more simply, no matter what font is used, your computer and other computers will always know exactly what symbol is called for and display the text correctly.

Note: AOSIS Publishing publishes in four different formats, namely, PDF, HTML, XML and ePUB. If your manuscript is not unicode compliant, then it will not be possible to produce all four formats. We will send the back to you to make the fonts Unicode compliant to enable us to produce all four formats.

How to check whether your font-type is unicode compliant

1. Open your manuscript in your text editor.
2. Highlight all the text within your manuscript and change the font to Arial or Times New Roman.
3. Scrutinise your entire manuscript.
    - **Document reads perfectly?** If the words are readable and identifiable, then the font that you are using is unicode compliant.
    - **Document has changed certain or all characters?** Font used is not unicode compliant and needs to be changed prior to submission to this journal.

Which fonts are Unicode compliant?

- To use Unicode, you will need to install (or find already installed) Unicode fonts on your computer. This is neither difficult nor costly.
- For basic information and links to numerous Unicode fonts, see http://www.alanwood.net/unicode/fonts.html
    - Arial Unicode MS
    - Courier New
    - DejaVu Serif
    - Gentium
    - Garamond
    - Minion Pro
    - Myriad Pro
    - Tahoma
    - Times New Roman
    - Verdana

Unicode in Windows

Installing fonts on a Windows computer is fairly simple.

1. Download the font.
2. If it is a compressed file (such as .zip), expand it.
3. Open the fonts folder by clicking on Start, then Settings, then Control Panel, then Fonts.
4. Drag the font file(s) into this folder. It should automatically install.

Using the insert symbol function

- Use the Insert Symbol function (found in the Insert menu). This function allows you to choose characters from a grid displayed in its own window. Double-clicking the desired character inserts it at the cursor in the document.
- Use the symbol insert window to assign keystrokes to the characters you use most often. For example, you might assign the keystroke alt+a to the lower case a with macron, and alt+shif+A to capital A with macron.

Keyboard for Windows

The preferred method for typing in Unicode. Essentially this means telling Windows that you want a different keyboard layout to be available for use. At this step things might vary from computer to computer.

- Click on Start, then Settings, then Control Panel.
- Double click Regional and Language Options. The window that opens should have three tabs: Regional Options, Languages, and Advanced.
- Click on the Keyboards and Languages tab.
- Options include installing additional languages or changing the keyboard. Read the guidelines provided by Windows carefully.
- Select 'Change keyboards' in the same window after installing additional language.
- To make it your default keyboard you must choose it in the drop down list under Default Input Language at the top of this window. Click Add.
- Proceed to select the 'Language Bar' tab at the top and ensure that the box 'Show additional Language bar icons in the taskbar' is ticked.

- Now there should be a little keyboard icon in the task bar at the bottom of your screen (if there wasn't already). (It will be next to the blue square with EN in it, which signifies that the current input language is English. If you use no other languages, this icon might not be there.) When you click on the small keyboard icon, a list of keyboard choices pops up. If you made Alt-Latin the default, it should be in bold type. (However, it may not appear until the next time you restart your computer. Until then it might be a blank line in the list.)

Typing with the alternative keyboard is simple. For most letters you will do things as you always have. When you need a special character or a character with a diacritic or accent, you will use key combinations with the Alt key to the right of the space bar (the one on the left side does not work for this in Windows, unfortunately). For example, to type the letter 'a' with a macron you hold down the Alt key and press the letter a, release them both, then type the letter a. For letters with a dot below them, hold down Alt, press the period key, release both, and then type the letter which needs the dot.

Unicode in Macintosh

To enter Unicode text on a Macintosh, you have several options.
Firstly, you may use the **Character Pallette**, which is found in the Input Menu (the flag menu in the upper right, near the clock).

- If the Character Pallette option is not shown, enable it by doing the following:
  - Go to the Apple menu, select System Preferences.
  - In the Preferences window, choose International.
  - Select Input Menu.
  - Check Character Pallette. You can also check Keyboard Viewer, Unicode Hex Input, and US Extended at this time.
  - Check Alt-Latin. If it is not there, see below for information on installing it.
  - Make sure the "Show Input Menu in menu bar" option is checked.
- To use the Character Pallette to enter Unicode characters in a document, just keep it open in the background. When you need a character, you can enter it by double clicking on it in Character Pallette.
- A useful feature of Character Pallette is the ability to designate frequently-used characters as favourites, saving you the trouble of finding the different letters each time you need them.
- For more information on Character Pallette, see Alan Wood's site: http://www.alanwood.net/unicode/utilities_fonts_macosx.html

Secondly, you may use the excellent and extremely simple **Alt-Latin keyboard** or **LatinTL keyboard**, both of which were created specifically for this purpose by Kino.

- To install either keyboard (or both of them), you must first download AltLatin.zip and/or LatinTL_X.dmg.sit from Alt-Latin page).
- If your browser does not automatically expand the .zip or .sit file, tell it to save the file to your desktop (so it will be easy to find), then manually expand it. Usually this can be done simply by double-clicking the file, which will start the appropriate decompression program. LatinTL expands to a disk image, but for the purpose of installation you can treat it just like a folder.
- Follow the instructions in the 'readme' file to install the keyboard(s).

- Make it visible in the Input Menu by following the instructions given above for the Character Pallette.
- Because Alt-Latin and LatinTL work like any other keyboard, you will not have to change keyboards unless you need to type in a different alphabet, such as Arabic.
- Entering letters with diacritics using either keyboard is very simple:
    1. Make sure you are using a Unicode font. It may work with other fonts, but you should use Unicode (OS X comes with Lucida Grande and there are others available).
    2. To enter a vowel with a macron, simply hold down either **option** key and hit the letter 'a' simultaneously. Release them, then type the letter that needs the macron (using the shift key if you need a capital).
    3. For letters with dots below, press option and period, release, then type the letter.
    4. Hamza is shift+option+P, and 'ayn is option+p. (This may not work in Microsoft Word with Alt-Latin – reason unknown. If it does not work, use the LatinTL keyboard instead, or use the Character Pallette for these two characters. These keystrokes do work in TextEdit and other software with Alt-Latin.)
- The PDF file included with Alt-Latin shows maps of the keyboard, in case you need something not mentioned here, or you may use our maps found on http://www.lib.uchicago.edu/e/collections/mideast/encyclopedia/unicode.html.
- The layout of LatinTL is very similar, with only a few differences, and it also includes maps. (See the Alt-Latin page for a description of the differences.)
- **Click** here **for diagrams of the Alt-Latin keyboard** (usable for LatinTL as well, with a few differences) and for downloads.
- The diagrams are for the Windows version, but the layout is almost identical to the Mac version. The main difference is that where the Windows version uses only the Alt key to the right of the space bar, the Mac version uses either of the two Option keys. This makes the Mac version a little more comfortable to use, since you can use either hand. (There is no Windows version of LatinTL.)
- There are downloadable PDF files of the diagrams available on the same page, in case you would like to print them for easier reference while typing.
- Kino's site (linked above) also has numerous other Macintosh keyboard and font resources, such as some keyboards based on non-US layouts (notably a UK variant of Alt-Latin).

Thirdly, you may want to use Knut S. Vikør's **Jaghbub keyboard layouts** (and, perhaps, his Unicode fonts).
His Arabic Macintosh pages have long been one of the web's most useful sources for Mac users who need to type Arabic or transliteration, and he has updated both the pages and the downloadable resources he created.

- The page on transliteration, 'Writing Arabic with Latin letters', explains the issues and provides a downloadable file containing the JaghbUni font package and the American Diacs. keyboard layout.
- The Jaghbub font package page gives more information about the three fonts included, as well as German, French, Italian, Danish, Swedish, Norwegian, US and UK keyboard layouts for typing diacritics in Unicode fonts.
- There are also separate keyboard layouts for typing IPA characters in Unicode fonts for the same national standards (that is, the non-option keys

follow the regular national keyboard standard, but the IPA characters are all placed on option keys under no particular standard).

For any keyboard layout, you can always select **Keyboard Viewer** from the Input Menu to see what different keystrokes will do.

These instructions were taken from:
http://www.lib.uchicago.edu/e/collections/mideast/encyclopedia/unicode.html

Harvard Reference Style Guide

Introduction

Notes: Please 'copy' the title of a book, an article or whatever (as far as the spelling of words such as 'behaviour' or 'behavioural' are concerned (and this also goes for direct quotations) exactly as in the original:

- When referring to any work that is NOT a journal, such as a book, article, or Web page, capitalise only the first letter of the first word of a title and subtitle, the first word after a colon or a dash in the title, and proper nouns. Do not capitalise the first letter of the second word in a hyphenated compound word.
- Capitalise all major words in journal titles, full names for journal titles, not abbreviations.
- If within the same paragraph, reference is made to **the same author(s) for a second and further time(s)**, the year of publication is omitted in the second and further references – as long as it does not lead to confusion
- Always cite page numbers within in-text citation – even if paraphrasing - example: Hallinan (2000:66)

Multiple publications; same author:

- Same author; **different years**
  Normal conventions (author, year, title, etc).
- Same author; **same year**
  More than one reference by an author in the same year: these are distinguished in **order of publication** using a lower-case alphabetical suffix after the year of publication (e.g. 1988a, 1988b, 1988c, etc). The same suffix is used to distinguish that reference for the in-text citations.

Order of Listing

The List of References is ordered **alphabetically** by primary authors' surnames.

- Multiple authors.
  - Use the sequence of authors' surnames exactly as given in the publication. The primary author, i.e., major contributor, is listed first by the publisher.
- Same author:
  - different years: list the author's references chronologically, starting with the earliest date.
  - same year: use an alphabetical suffix (e.g. 1983a, 1983b).

If you are going to use the abbreviation for USA state names then please make sure the abbreviation is correct, for example:

- Doss, G., 2003, *IS project management handbook,* Prentice Hall, Upper Saddle River, NJ. (No full stops between the abbreviations).

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Updated 13 April 2017 by AOSIS

Books

Books	In-Text Example	Reference List Example
Single Author	(Doss 2003)	Doss, G., 2003, *IS project management handbook*, Aspen Publishers, New York. Karskens, G., 1997, *The rocks: Life in early Sydney*, Melbourne University Press, Carlton.
Two Author	(Laudon & Laudon 2003)	Laudon, K.C. & Laudon, J.P., 2003, *Essentials of management information systems: Managing the digital firm*, Prentice Hall, Upper Saddle River.
Three authors	**In-text: initially** (Coveney, Ganster & King 2003) **In-text: thereafter** (Coveney et al. 2003)	Coveney, M., Ganster, S. & King, D., 2003, *The strategy gap: Leveraging technology to execute winning strategies*, Wiley, Hoboken.
Corporate author	**In-text: initially** (Department of Foreign Affairs and Trade 2002) **In-text: thereafter** (DFAT 2002)	Department of Foreign Affairs and Trade, 2002, *Connecting with Asia's tech future: ICT export opportunities*, Economic Analytical Unit, Commonwealth Government, Canberra.
Book Editor	(ed. Shaw 2003) Shaw (ed. 2003:87) indicates that '... Current essays edited by Shaw (2003) suggest ...	Shaw, M.J. (ed.), 2003, *E-business management: Integration of Web technologies with business models*, Kluwer Academic, London. Schuman, N.A., 2001, 'Psalm 91: Tekst, context, en een diversiteit aan herlezingen', in P. Post, G. Rouwhorst, T. Sheer, R. Steensma & L. Tongeren (reds.), *Jaarboek voor liturgieonderzoek deel*, vol. 17, pp. 237–256, Instituut voor Liturgie-wetenschap, Groningen. Spieckermann, H., 2003, 'Hymnen im Psalter – Ihre Funktion undn ihre Verfasser', in E. Zenger (Hrsg.), *Ritual und poesie*, pp. 90–136, Herder, Freiburg.

Book collection or One volume of multi-volume work	(eds. Hudson & Bolton 1997) Hudson and Bolton (eds. 1997:32) stated that '...'.	Hudson, W. & Bolton, G. (eds.), 1997, *Creating Australia: Changing Australian history*, Allen & Unwin, Sydney.
Chapter: single author	(Howard 1998)	Howard, S., 1998, 'Verbal Protocol Analysis', in B. Henderson-Sellers, A. Simons & H. Younessi (eds.), *The open process specification*, pp. 272–274, Addison Wesley, Sydney.
Chapter: three authors	**In-text: initially** (Johnston, Mak & Kurnia 2001) **In-text: thereafter** (Johnston et al. 2001)	Johnston R.B., Mak H.C. & Kurnia S., 2001, 'The contribution of Internet Electronic Commerce to advanced supply chain reform - a case study', in S. Barnes & B. Hunt (eds.), *E-Commerce and V-Business*, pp. 232–249, Butterworth-Heinemann, Oxford.
Four or more authors but equal to six. **See reference on how to cite more than 6 authors in this reference guide below**	A comprehensive study conducted in 1998 indicated that business in Australia is growing exponentially (Jones et al. 1999). *Or* Jones et al. (1999:34) suggested in their comprehensive study that '...'. **Note: If there is another reference starting with Jones, for example, Jones, Larsen, Green and Matthews, the names of all the authors should be given in both cases to avoid confusion.**	Jones, P., Smith, A., Hudson, T., Etherton, J., Connelly, W. & Gardener, J., 1999, *Business management for the new era*, Wyland Publishing, Adelaide. **Note: Use et al. in all in-text entries. Include all of the authors in the reference list.**
Article cited in a book		Oppenheim, P.L., 1981, 'Power politics', *Journal of Power Engineering* 1(3), 19–26, quoted in K. Strong, 1985, *Advances in power engineering*, Springer-Verlag, Berlin, p. 70.
Second, further or revised editions		Dyson, G.G.H., 1977, *The mechanics of athletics*, 7th edn., Homes and Meier, New York. Cohen, J., 1977, *Statistical power analysis for the behavioural ciences*, rev. edn., Academic Press, New York.
Translated works		Bakhtin, M., 1984, Rabelais and his world, transl. H. Iswolsky, Indiana University Press,

		Bloomington. Izedinova, S.V., 1977, *A few months with the Boers: The war reminiscences of a Russian nursing sister,* transl. C Moody, Perskor, Johannesburg.
Multiple works – same author	University research (Brown 1982, 1988) has indicated that … *or* Recent reports (Napier 1993a, 1993b) indicate that … **Note: When using two studies by the same author in different years, paraphrasing is essential. Place in chronological order—oldest first.** Ideas by Napier (1993b) were implemented … **Note: You may use direct quotes when using the sources separately.** **Add a, b, c, etc. to differentiate between works in the same year by using the alphabetical order of the title.**	Brown, P., 1982, *Corals in the Capricorn group*, Central Queensland University, Rockhampton. Brown, P., 1988, *The effects of anchors on corals*, Central Queensland University, Rockhampton. Napier, A., 1993a, *Fatal storm*, Allen & Unwin, Sydney. Napier, A., 1993b, *Survival at sea*, Allen & Unwin, Sydney.
Works by different authors—same family name—same year	A. Carter (1999) proposed that class size seriously limited creativity in the lower school. Further investigation proved there were notable weaknesses in this claim (Carter, T 1999). **Note: As a general rule, it is advisable to paraphrase in this instance.**	Carter, A., 1999, *Issues in Australian education*, Cherokee Publications, Brisbane. Carter, T., 1999, *Creativity in the classroom*, Watkins & O'Hara Publishers, Darwin.
Second or later edition with an author	Group dynamics has been identified as … (Johnston 1993). *Or* A recent theory (Johnston 1993:5) on group dynamics states that '…'.	Johnston, K., 1993, *Surviving the first year experience, 2nd edn.*, Macmillan, Melbourne.
Several sources are cited at once	Bradford (1992), Curtis (1983), and Graham (1997) all agree … *Or* Recent studies (Bradford 1992; Curtis 1983; Graham 1997) agree that …	Bradford, C., 1992, *Genre in perspective: A whole language approach*, Bookshelf, Gosford. Curtis, A., 1983, *Practical math for business*, Houghton Mifflin, Boston. Graham, A., 1997, *Managing*

	Note: Paraphrasing is essential if you are going to cite the essence of what the authors all agree upon. Alphabetise according to the name of the first author in each source. Separate entries by using semicolons.	*more postgraduate research students*, Oxford Centre for Staff Development, Oxford. Note: Each author will appear as a separate entry in the reference list.
No date can be established	Bridging courses are studied by students who have not previously … (Lansdown n.d.). *Or* Lansdown (n.d.:13) found that '…'	Lansdown, M., n.d., *Bridging courses*, Central Queensland University, Rockhampton.
The date can be established but only approximately	In a draft policy release, the Queensland Education Department (c. 1995) suggests… or 'Disciplining a child should not invoke …' (Queensland Education Department c.1995:xxii).	Queensland Education Department, c. 1995. *Draft policy on school discipline*, Author, Gladstone.

Journals

Journals	In-Text Example	Reference List Example
Single author	(Hammer 1990:104–112)	Hammer, M., 1990, 'Reengineering Work: Don't Automate, Obliterate', *Harvard Business Review*, July–August, 104–112. Kozulin, A., 1993, 'Literature as a psychological tool', *Educational Psychologist* 28(3), 253–265.
Two authors	(Lamb & Kling 2003:197)	Lamb, R. & Kling, R., 2003, 'Reconceptualizing users as social actors in information systems research', *MIS Quarterly* 27(2), 197.
No volume or issue number	Sprague and Shameen (1999) indicate that alternatives to continual economic growth... *Or* It has been suggested that '[g]rowth at all cost is no longer a viable option' (Sprague & Shameen 1999: 50).	Sprague, J. & Shameen, A., 1999, 'Boosting growth, courting disasters?', *Asiaweek*, 31 July, 50–51.
Journal articles and book chapters from books of readings		Kuebler, S.A., 2004, 'OSHA's enforcement strategy', Occupational Health & Safety 73(12), 12–3, in I. Eddington (ed.), *MGT 8015 Corporate occupational health and safety: Selected readings*, 2005, University of Southern Queensland, Toowoomba, Reading 4.1, pp. 71–72. Hancock, L., 2002, 'Australian federalism, politics and health', in H. Gardner & S. Barraclough (eds.), Health policy in Australia, 2nd edn.,

		Oxford University Press, South Melbourne, in I. Eddington (ed.), *MGT 8015 Corporate occupational health and safety: Selected readings*, 2005, University of Southern Queensland, Toowoomba, Reading 1.2, pp. 28–35.
Non-English journal article		Give the original title, as well as an English translation in brackets. Ising, M., 2000,'Intensitätsabhängigkeit evozierter Potenzial im EEG: Sind impulsive Personen Augmenter oder Reducer?' [Intensity dependence in eventrelated EEG potentials: Are impulsive individuals augmenters or reducers?], *Zeitschrift für differentielle und diagnostische Psychologie* 21, 208–217.
Back dating articles		The volume number should be provided in Arabic numeral, without the preceding abbreviation 'v', 'vol.' or 'jrg.'. Full page numbers must be given. If the date or place of publication is missing, the abbreviation 'n.d.' is used instead of referring to the date of publication and 's.l.' instead of referring to the place of publication. **The date is placed in square brackets if the date of publication is known to the user but is not explicitly mentioned in the book or journal.** Pont, A.D., [1978], 'Die herderlijke brief van die sinode van 1837', *HTS*

		Teologiese Studies/Theological Studies 34(4), 91–105.
Supplement journal		Fisk, B.N., 2001, 'Do you not remember? Scripture, story and exegesis in the rewritten Bible of Pseudo-Philo', *Journal for the Study of the Pseudepigrapha*, suppl. ser. 37.

Proceedings

Proceedings	In-Text Example	Reference List Example
Published Conferences, seminars and meetings	(Eidenberger et al. 2002)	Eidenberger, H., Breiteneder, C. & Hitz, M., 2002, 'A framework for visual information retrieval', in S-K. Chang, Z. Chen & S-Y. Lee (eds.), *Recent advances in visual information systems: 5th International conference, VISUAL 2002 proceedings*, Hsin Chu, Taiwan, March 11–13, 2002, pp. 105–116.

Unpublished material

Unpublished material	In-Text Example	Reference List Example
Unpublished conference paper	(Fitzsimmons 2005)	Fitzsimmons, D., 2005, 'Who chooses who belongs: Tactics and strategies and migrant literature', paper presented at the AULLA & FILLM conference, James Cook University, Cairns, 15–19th July.
Theses and Reports	(Rouse 2002)	Rouse, A.C., 2002, 'Information technology outsourcing revisited: success factors and risks', PhD thesis, Dept. of Information Systems, University of Melbourne.

Encyclopedias and Dictionaries

Encyclopedias and Dictionaries	In-Text Example	Reference List Example
Encyclopedias and Dictionaries	(Karlof 2002)	Karlof, B., 2002, 'Benchmarking', in H. Bidgoli (ed.), *Encyclopedia of information systems*, Academic Press, New York, vol. 1, pp. 65–80.

Newspaper

Newspaper	In-Text Example	Reference List Example
Print unattributed	(Sydney Morning Herald 7 March 1994:8)	'UNSW gains top ranking from quality team', Sydney Morning Herald, 30 February, 1994, p. 21.
Print attributed	(Barker 2004)	Barker, G., 2004, '$54m Deal To Heat Up Broadband War', *The Age*, Business, 24 February, p. 2. Donaghy, B., 1994, 'National meeting set to review tertiary admissions', Campus News, 03–09 March, p. 3.
Online	(Varghese 2004)	Varghese, S., 2004, 'The

		Linux desktop is here', *The Age*, viewed 01 March 2004, from http://www.theage.com.au/articles/2004/02/13/1076548215848.html.

Magazine

Magazine	In-Text Example	Reference List Example
Single author	(Knight 2004)	Knight, W., 2004, 'How to second guess the next hack attack', *New Scientist*, 24 January, p. 19. Note: Always evaluate information found in magazines for 'scholarliness'– including bias, validity, trustworthiness of the authors etc. Magazines are not generally considered scholarly pieces of work for research.

Software

Software		
Named author	(Rawson-Tetley 2005)	Rawson-Tetley, R., *Animal Shelter Manager*, computer software, viewed 11 January 2005 from http://sheltermanager.sourceforge.net.
No named author	(OpenOffice.org 2005)	*OpenOffice.org*, computer software, viewed 11 January 2005, from http://www.openoffice.org.
Corporate publisher	(MATLAB 2003)	*MATLAB* version 6.5.1, 2003, computer software, The MathWorks Inc., Natick, Massachusetts. 1. Title of software - in italics: *MATLAB* 2. Version of

		software: version 6.5.1, 3. Year of publication: 2003, 4. Identifier: computer software, 5. Publisher: The MathWorks Inc., 6. Place of publication: Natick, Massachusetts.

World Wide Web

World Wide Web		
Document on the WWW (author or sponsor given but not dated)	According to Greenpeace (n.d.), genetically modified foods are ... *or* Greenpeace (n.d.:1 of 2) recommends that 'fewer genetically ...'.	Greenpeace n.d., *The future is GE free*, viewed 28 September 2005, from http://www.greenpeace.org.au/ge/farming/canola.html. **Note: The title of a webpage is treated like the title of a book. It is written in italics in the reference list.**
Identifiable, personal author	(Arch & Letourneau 2002)	Arch, A. & Letourneau, C., 2002, 'Auxiliary Benefits of Accessible Web Design', in *W3C Web Accessibility initiative*, viewed 26 February 2004, from http://www.w3.org/WAI/bcase/benefits.html.
E-book	(Eck 2002)	Eck, D.J., 2002, *Introduction To Programming Using Java*, 3rd edn., OOPWeb.com, viewed 26 February 2004, from http://www.oopweb.com/Java/Documents/IntroToProgrammingUsingJava/VolumeFrames.html.
E-journal: single author	(Lenoir 2003)	Lenoir, L., 2003, 'Response of the

		foraging behaviour of red wood ants (Formica rufa group) to exclusion from trees', *Agricultural and Forest Entomology* 5(3), 183–189, viewed 10 September 2003, from http://www.blackwell-synergy.com/links/doi/10.1046/j.1461-9563.2003.00176.x/full/.
E-journal: three authors	(Mueller et al. 2003)	Mueller, J.K., Heckathorn, S.A. & Fernando, D., 2003, 'Identification of a chloroplast dehydrin in leaves of mature plants', *International Journal of Plant Sciences* 164(4), 535–542, viewed on 10 September 2003, from http://www.journals.uchicago.edu/IJPS/journal/no.s/v164n4/164053/164053.html.
E-journal: Abstract and more than 6 authors	(Wolter et al. 2003)	Wolter, B.F., Ellis, M., Corrigan, B.P., DeDecker, J.M., Curtis, S.E., Parr, E.N. et al., 2003, 'Effect of restricted postweaning growth resulting from reduced floor and feeder-trough space on pig growth performance to slaughter weight in a wean-to-finish production system', *Journal of Animal Science*, (abstract), vol. 81, viewed 11 September 2003, from http://buffy.lib.unimelb.edu.au:2148/jas/abs/2003/a0340836.htm..

Other References

Other References		
CD-ROM	(World Atlas & Almanac 1995)	*World Atlas & Almanac*, 1995, CD-ROM, Mindscape Inc., Novato, California, USA.
Video & Audio	(*Grumpy meets the orchestra* 1992)	*Grumpy meets the*

Recordings: named		*orchestra*, 1992, video recording, Australian Broadcasting Corporation, Sydney, Featuring the Sydney Symphony Orchestra.
Video & Audio Recordings: named performer	(Sangare 1997)	Sangare, O., 1997, 'Dugu Kamalemba', in *The divas from Mali,* audio CD, Network Medien GmbH, D-60316 Frankfurt. Track #10. 1. Author (performer): Sangare, O., 2. Date (year): 1997, 3. Title (piece) - in single quotes: 'Dugu Kamalemba', 4. Title (collection) - in italics: in *The divas from Mali,* 5. Identifier: audio CD, 6. Publisher: Network Medien GmbH, 7. Place: D-60316 Frankfurt. 8. Qualifier: Track #10.
Personal Communication: individual	• When interviewed on 15 May 2001, Mr R. Forbes stated... OR • Mr R. Forbes confirmed his statement by fax on 15 May 2003... OR • The statement claimed that Martians had landed in Moonee Ponds (R. Forbes [Australian UFO Society] pers. comm., 15 May 2003). Not included in the Reference list.	
Personal Communication: email	(Milnthorpe 2002)	Milnthorpe, R.Q., 2002, email, 26 November, milnthorpe@scraggemback.com.au 1. Author: Milnthorpe, RQ 2. Date (year): 2002, 3. Identifier: email, 4. Date: 26 November, 5. Address: milnthorpe@scrag

		gemback.com.au
Personal Communication: lectures	• 'There is no need to panic', stated Mr R. Forbes at his public lecture on 18 May 2003 ... OR • The Chair (Seminar on the Moonee Ponds Phenomena 11 June 2003) drew attention to the unexplained spontaneous combustion of Mr Ron Forbes ... Not included in the Reference list.	
Maps: print	(Viking O'Neil 1991:32–33)	Viking O'Neil, 1991, *Australian Road Atlas*, 10th edn., Penguin Books Australia, Melbourne, pp. 32–33. 1. Author: Viking O'Neil 2. Date: 1991, 3. Title - in italics: *Australian Road Atlas*, 4. Edition: 10th edn., 5. Publisher: Penguin Books Australia, 6. City: Melbourne, 7. Pages: pp. 32–33.
Maps: online	(maps.com 1999)	maps.com, 1999, *Bhutan*, viewed 11 September 2003, from http://www.maps.com/cgi-bin/search/hyperseek.cgi?search=CAT&Category=Asia%3ABhutanP&Qualifier= 1. Author: maps.com, 2. Date: 1999, 3. Title - in italics: *Bhutan*, 4. Viewed: viewed 11 September 2003, 5. URL: from http://www.maps.com/cgi-bin/search/hyperseek.cgi?search=CAT&Category=Asia%3ABhutanP&Qualifier=

Government

Government		
Media Releases	(Alston 2003)	Alston, R., (Australian Minister for Communications, Information Technology) 2003, *Australian Government to ban spam*, media release 122/03, National Office for Information Economy, Canberra, viewed 23 July, from http://www.noie.gov.au/publications/media_releases/2003/Jul/spam.htm
Government media releases	According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (1997–2004:5 of 12), 'the benefits of the new sheep weighing technology ...'.	Commonwealth Scientific and Industrial Research Organisation (CSIRO), 1997–2004, *Revolutionary sheep weigher on trial*, media release Ref PRO 4_168, 15 Sept 2004, viewed 16 September 2004, from http://www.csiro.au/index.asp?type=mediaRelease&id=sheepweigher&style=mediaRelease
Government publication and regulations	(Department of Education, Science & Training 2000) When citing government, legal or standards documents, it is recommended that for citing divisions of Acts and Ordinances, use s. or ss. for citing sections. For example: • in ss. 4–7 of the *Copyright Act 1968* • the Copyright Act, ss. 4–7 • in s. 4 of the Casino Control Ordinance. When citing regulations, use r. and rr. For example: • the Copyright Regulations, rr. 18–19 • the Commonwealth's Copyright Regulations, r. 18 • in r. 4 of the Copyright Regulations. When citing legal authorities, the following details are necessary: • name of case	Department of Education, Science & Training, 2000, *Annual Report 1999-2000*, AGPS, Canberra. Department of Immigration and Multicultural Affairs 2001, *Immigration: Federation to century's end 1901-2000*, Statistics Section, Business Branch, Department of Immigration and Multicultural Affairs, Canberra.

	• year or volume number or both • abbreviated name of the report series • the page on which the report of the case begins. For example: The State of New South Wales vs The Commonwealth (1915) 20 CLR 54	
Legislation	It must be realised that intent must be established before a prosecution can proceed concerning underage drinking (Queensland Government 1962, s. 12, ss. 5). Or Intent must be established before a prosecution can '...' (Queensland Government 1962, s. 12, ss. 5).	Queensland Government, 1962, *Queensland State Liquor Act*, Author, Brisbane. **Note: Author refers back to the sponsor who is also the publisher.**
Standards	According to the Standards Association of Australia (1997), ...	Standards Association of Australia, 1997, *Australian standard: Pressure equipment—manufacture*, (AS4458-1997), Standards Australia, North Sydney.
Patents	Tan and Arnold (1993) formalised and protected their ideas ... *Or* Tan and Arnold (1993, n.p.) protected their ideas by '...'	Tan, I.S. & Arnold, F.F., (US Air Force) 1993, *In situ molecular composites based on rigid-rod polyamides*, US patent 5 247 057.
Brochure	(New South Wales Dept of Primary Industries 2005)	New South Wales Dept of Primary Industries, 2005, *Saltwater recreational fishing in New South Wales: Rules & regulations summary*, brochure, NSWDPI, New South Wales. Include as much information as available. The publisher's name may be abbreviated if it is also the author.
To cite a work reproduced in a	De Kooning's 1952 painting 'Woman and Bicycle' (Hughes 1980:295) is an example	Hughes, R., 1980, *The shock of the new: Art*

book (image, poem, painting etc.)	of ...'	*and the century of change*, British Broadcasting Corporation, London.
Study Guide (author known)	Reports by Hallinan (2000) indicate that... *Or* Similarly, Hallinan (2000:66) reported that '...'.	Hallinan, P., 2000, *EDED48102 Development and disability: Study guide*, Central Queensland University, Rockhampton.
Study Guide (author unknown)	A recent report (Central Queensland University (CQU) 2000) has suggested that ... *Or* Findings from a 1999 study indicate that '...' (Central Queensland University (CQU) 2000:5).	Central Queensland University (CQU), 2000, *EDE48201 Development and disability: Study guide*, Author, Rockhampton.
Tutorial or workshop handout (unpublished)	The importance of aerobic exercise ... (The respiratory system 2000). *Or* Aerobic exercise is valuable because of its '...' (The respiratory system 2000:1).	The respiratory system, Tutorial handout distributed in the unit, HHM72160 Human anatomy, Central Queensland University, Gladstone on 2 March 2000. **Note: No italics or quotation marks are shown because class handouts are unpublished sources.**
Lecture notes (unpublished)	Thompson (2001) found that the first teaching day may result in mixed emotions for many first year teachers. *Or* It has been found that beginner teachers, on their first day in the class room, will '... ' (Thompson 2001:1).	Thompson, R., 2001, The first day experience, Lecture notes distributed in the unit, EDED48314 Professional practice III, Central Queensland University, Bundaberg on 21 April 2001.
The Bible	These particular lines (Psalm 23:6–8) refer the reader to ...	**Note: Bible references are not included in a reference list.**
Atlas (with an editor)	The position of the new city is to be in south-east Queensland (ed. Eales 2003, Map 34).	Eales, S. (ed.), 2003, *The Jacaranda atlas*, 3rd edn., John Wiley & Sons, Brisbane.
Atlas (with no editor)	The position of the new city is to be in south-east Queensland (*The Jacaranda*	*The Jacaranda atlas* 2003, 3rd edn., John

	atlas 2003, Map 34).	Wiley & Sons, Brisbane.
Books in press	(Bloggs in press)	Bloggs, J., (in press), 'A new book that I have written', Vanity Press, London.

Abbreviations:

art.	article
app.	appendix
c.	about, approximately (from Latin *circa*)
cf.	compare (from Latin *confer*)
ch.	chapter
col., cols.	column(s)
div.	division
ed., eds.	editor(s)
edn.	edition
et al.	and others (from Latin *et alii*)
fn., fnn.	footnote(s)
ill., ills.	illustrator(s)
l., ll.	line(s)
MS., MSS.	manuscript(s)
n., nn.	Notes
n.d.	no date
n.p.	no place
p., pp.	page(s)
para., paras.	paragraph(s)
pl.	plate (photograph)
pt., pts.	part(s)
rev.	revised
ser.	series
suppl.	Supplement
transl.	Translated
v.	verse (Bible)
vv.	verses (Bible)
vol., vols.	volume(s)

Abbreviations for Bible Books (as recommended by NTSWA English):

Use abbreviation of Bible Book when in parenthetical citation [example: (Mt 28:19)], but the full book name when in a sentence [example: According to Matthew 28:19]

Gn	Ex	Lv	Nm	Dt	Jos	Jdg
Rt	1 Sm	2 Sm	1 Ki	2 Ki	1 Chr	2 Chr
Ezr	Neh	Es	Job	Ps	Pr	Ec
Can	Is	Jr	Lm	Ezk	Dn	Hs
Jl	Am	Ob	Jnh	Mi	Nah	Hab
Zph	Hg		Zch	Ml		
Mt	Mk	Lk	Jn	Ac	Rm	1 Cor
2 Cor	Gl	Eph	Phlp	Col	1 Th	2 Th
1 Tm	2 Tm	Tt	Phlm	Heb	Ja	1 Pt
2 Pt	1 Jn	2 Jn	3 Jn	Jude	Rv	

Abbreviations for Bible Books (S A Academy of Science and Art, Afrikaans):

Gen	Eks	Lev	Num	Deut	Jos	Rig
Rut	1 Sam	2 Sam	1 Kon	2 Kon	1 Kron	2 Kron
Esra	Neh	Est	Job	Ps	Spr	Pred
Hoogl	Jes	Jer	Klaagl	Eseg	Dan	Hos
Joël	Am	Ob	Jona	Miga	Nah	Hab
Sef	Hag	Sag	Mal			
Matt	Mark	Luk	Joh	Hand	Rom	1 Kor
2 Kor	Gal	Ef	Fil	Kol	1 Tess	2 Tess
1 Tim	2 Tim	Tit	Filem	Heb	Jak	1 Pet
2 Pet	1 Joh	2 Joh	3 Joh	Jud	Op	

Other resources:

http://www.lc.unsw.edu.au/onlib/ref2.html
http://www.lib.monash.edu.au/tutorials/citing/harvard-government.html
http://www.lib.unimelb.edu.au/cite/harvard_dis/index.html#Example
http://www.usq.edu.au/library/help/referencing/harvard.htm#Books_print_and_online

3.2 Health SA Gesondheid online submission: Cover letter to the editor in chief

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Health SA Gesondheid
Journal of Interdisciplinary Health Sciences

04 June 2019

Dear Editor-in-Chief

SUBMISSION: ORIGINAL RESEARCH ARTICLE

Herewith the details and manuscript for submission for possible publication.

Title: The research capacity and research-capacity needs of nurse educators in public nursing colleges

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Authors' contributions:

Mrs Dhladhla conceptualised, designed and executed the research study under the supervision of Mr Watson and Dr van Waltsleven. Mr Watson and Mrs Dhladhla contributed substantially to the intellectual content and the finalisation of the article. The article was approved by all the authors after a final review of the content.

Disclaimer:

This article has not been submitted for publication elsewhere. Views expressed in this article are the authors' views and in no wat that of the institution. The content of the article was validated and approved by contributing authors. Ethical approval was granted by North-West University

(Certificate no: NWU-00374-15-A1). Participants in this study gave voluntary informed consent and data was collected anonymously. Appropriate measures were put in place to ensure rigour.

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Thank you for considering this manuscript for publication.

Yours sincerely

Francois Watson

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Date: 2019.06.05 10:36:47 +02'00'

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Senior Lecturer

3.3 Article

Research capacity and research-capacity needs of nurse educators employed in Provincial Nursing Colleges.

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Abstract

Introduction and background: Research capacity is a crucial requirement for higher education institutions (HEIs) to render quality nursing education and to maintain their credibility. The proposed transformation in nursing education presents new challenges for nurse educators employed by provincial nursing colleges, especially challenges in the areas of research and academic qualifications. Nurse educators at provincial nursing colleges should be prepared for their new roles. Therefore, it is important that provincial nursing colleges have a broader understanding of current research capacity and research-capacity development needs of nurse educators. This study focused on provincial nursing colleges in the Gauteng province of South Africa.

Aim: This study aims to gain a deeper understanding on the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

Method: A descriptive quantitative, cross-sectional survey design was used for data collection. The population was nurse educators employed by four provincial nursing colleges in Gauteng province, for a period of at least six months. Data was gathered from 137 respondents using a self-administrative questionnaire.

Results: Nurse educators perceived their research skills as reasonable in all the research phases, with the highest (*M* = 2.94, SD 0.940) for the exploratory phase and lowest for the data analysis phase (*M* = 2.48, SD 0.949). The nurse educators indicated a need for institutional support in terms of time and funding to pursue their studies, to improve their research capacity.

Conclusion: Provincial nursing colleges should design and implement strategies and interventions aimed at developing the research capacity of nurse educators, based on their current research capacity and research-capacity development needs, in order for the colleges to effectively transform and thrive as HEIs and to develop nurse educators as academics.

Keywords: research capacity, research-capacity needs, nurse educators, nursing college.

Word count (293)

1. Introduction

Internationally, research capacity in higher education (HE) is regarded as an essential capability for universities to produce knowledge and a sound evidence base for decision making to develop skills, drive innovation and help enhance economic growth (Cooke 2005; Oprescu et al. 2017). Several authors defined research capacity as the ability to conduct, use and sustain quality research (Masika et al. 2014; Segrott, McIvor & Green 2006; Uys & Klopper 2014). Based on this definition, one may conclude that research capacity is an essential element for an individual's and organisation's research productivity. Thus the establishment of research capacity precedes productivity, meaning that robust research capacity is a foundation to research productivity (Phelan et al. 2015).

However, nursing education in South Africa is experiencing a deficit in the research capacity needed to meet future national health-care demands (Sheehan et al. 2015). Studies conducted on research capacity of nurse educators demonstrate that nurse educators have several research capacity needs that hinder their participation in research. These studies revealed that most nurse educators do not feel confident in undertaking all research steps (Oprescu et al. 2017; Wyllie et al. 2016). Lack of research skills, particularly in areas of research proposal development, statistical analysis, knowledge dissemination and accessing grants, was identified by Squires et al. (2017:5) and Van Rensburg, Armstrong and Geyer (2017:10) as research-capacity development needs for nurse educators. Van Rensburg et al. (2017:10) further revealed that, despite initiatives to improve the research capacity of nurse educators at nursing colleges, there had been no positive impact on the rates of publications or presentations at conferences. Although this is not a unique problem (Roets & Bhembe 2016), what is not as visible within the nursing colleges is a systematic focus on the research capabilities of those professionals who need to use the research (Whitworth, Haining & Stringer 2012).

2. Background and literature review

The nurse educators are expected to conduct or participate in research activities regardless of their work context (McAllister & Flynn 2016; Oprescu et al. 2017) as contemplated in the competencies of nurse educators (South African Nursing Council 2014). Currently, most of the nurse educators are teaching in provincial nursing colleges as compared to universities, as evidenced by the South African Nursing Council (SANC) statistics that show that 80% of the four-year programme output is from provincial nursing colleges and only 20% is from universities (South African Nursing Council 2018). In the provincial nursing colleges' setting, the focus is more on teaching than research, and the scholarship of discovery is not recognised as one of the key performance areas of nurse educators at provincial nursing colleges, as is the case with nurse

educators at universities (Roets & Bhembe 2016). This is of great concern because a change in the training of nurses is envisaged. As nursing programmes are migrating to higher education, research and public presentation skills are essential for all nurse educators (Van Rensburg et al. 2017; Wyllie et al. 2016). Consequently, there is a strong imperative to promote research capacity for nurse educators as they will be expected to maintain research output in the near future.

Migrating nursing education to HEIs is not an isolated sub-Saharan phenomenon but a global trend (Ayandiran et al. 2013). Internationally the training of nurses has been transferred from the apprentice-style, hospital-based setting to tertiary-based courses, which resulted in a significant shift away from a sole emphasis on educating student nurses to more complex and challenging work, such as research and scholarly activities (McDermid et al. 2013). In South Africa, the last date for nursing students to enrol in academic programmes that are not aligned with the Higher Education Qualification Framework is 31 December 2019 (South African Nursing Council 2016). Therefore, provincial nursing colleges must become autonomous HEIs by 2020. This transformation process, though positive in both approach and impact, poses numerous challenges and hurdles for the current national nursing education system (Roets & Lubbe 2014). One of the challenges highlighted in literature is that most of the institutions that have undergone this process end up being staffed by a large number of lecturers from the colleges, who struggle to assume academic identity in higher educational institutions (Wyllie et al. 2016).

The HEI's core functions are teaching and research, as stipulated in the Higher Education Act (101 of 1997). The HEIs are receiving a government subsidy for teaching outputs; in addition, these institutions rely on research output as a major avenue for generating revenue (Department of Higher Education and Training 2015). However, research productivity is a culture that is unknown to those at provincial nursing colleges (Roets & Lubbe 2014). It is clear that the nurse educators would be disadvantaged by the criteria for advancement or promotion in higher education policies that strongly emphasise research productivity over and above other academic duties such as teaching and administration (Gething & Leelarthaepin 2000). Furthermore, the provincial nursing colleges would be disadvantaged in terms of their credibility and acceptance status within the higher education sector (Gething & Leelarthaepin 2000). Last but not least, the lack of research production would lead to stagnation in the body of knowledge for nursing education (Oprescu et al. 2017). Therefore, bearing in mind that nursing programmes are migrating to higher education, research and public presentation skills are essential for all nurse educators in provincial nursing colleges (Van Rensburg et al. 2017; Wyllie et al. 2016). This means that nurse educators in the nursing colleges will have to develop or improve their research capacity to thrive in the higher education sector (Van Rensburg et al. 2017). The development or improvement will depend on the individual nurse educator's development needs. Thus an inquiry

regarding the current research capacity and research-capacity needs of nurse educators is needed (McAllister & Flynn 2016; Van Rensburg et al. 2016; Wyllie et al. 2016).

The ability to conduct research requires knowledge of common research language and skills (Gullick & West 2016), a positive attitude towards research, and confidence to undertake research (Levine et al. 2013). The ability to undertake research is viewed as a necessary precursor to productivity, but it requires specific skills, a culture of collaboration, and sustainable pathways for researching a busy clinical or educational environment (Gullick & West 2016). Increasing research capacity amongst nurse educators is vital for generating research output and identifying research priorities relevant to nursing education (McMaster et al. 2013). Active participation in research has proved to assist with gaining confidence in research methods and is integral to becoming research active and performing meaningful research (Duffy et al. 2015). The professionals falling into the active research group include those who are undertaking a research degree at postgraduate level or have research embedded in their substantive job with numerous links to academics and research-orientated information and support (Sheehan et al. 2015). However, what is not as visible within the organisations is a systematic focus on the research capabilities of those professionals who need to use the research (Whitworth et al. 2012).

The research productivity of academic staff also depends on the presence of contextual factors such as doctoral preparation, publication options and availability of resources that enable them to conduct and publish studies to generate knowledge that informs nursing practice (Griffioen et al. 2013). However, some nurse educators at provincial nursing colleges do not have higher degree qualifications (McDermid et al. 2013; Begley et al. 2013). Therefore, these nurse educators will have to upgrade their qualifications (Oprescu et al. 2017) and develop appropriate research skills (Van Rensburg et al. 2017). Thus, it is essential to explore the current research capacity of nurse educators in provincial nursing colleges to ensure that these institutions and their academic staff meet the research-output requirement (Whitworth et al. 2012).

Different authors have identified several strategies that may assist to address the research-capacity needs of nurse educators in HEIs. Some of these strategies include creating and embracing a research culture, research training, building infrastructure and increasing resources, mentoring, balancing the needs of individual and organization, and building communities of research practice (Asuquo et al. 2013; Griffioen et al. 2013; Masika et al. 2014; Roets & Bhembe 2016; Roets & Lubbe 2014; Segrott et al. 2006; Squires et al. 2017). However, the first step is to map the current research capacity, as well as staff research-training needs to determine which strategies should be selected (Oprescu et al. 2017). The focus of this study will therefore be to identify and describe the current research capacity and research-capacity needs of nurse educators at provincial nursing colleges.

3. Problem Statement

At HEIs, research productivity is mandatory to maintain quality research and output. Thus the proposed transformation of nursing education in South Africa presents new challenges for the nurse educators, especially in areas of research and academic qualifications (Van Rensburg et al. 2017). Given this background, it is evident that this transformation would require the nurse educator to be involved in research as well as teaching (Roets & Bhembe 2016).

This is of concern because several studies (Ayandiran et al. 2013, McDermid et al. 2013; Roets & Bhembe 2016) found that the academics who were transferred to HEIs were unprepared for their new roles and were overwhelmed by having to study for a Master's degree, teach and conduct research, all at the same time. The question that arises is, 'What are the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa?'

4. Research aim

This study aimed to gain a deeper understanding of the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

In order to achieve the aim, the following objective was formulated:

- To identify and describe the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

5. Definition of key concepts

5.1. Nurse educator

A Nurse educator is a Professional Nurse with an additional qualification in nursing education and is registered with the SANC (SANC, 2014:1). The nurse educator teaches and prepares competent nursing practitioners in theory and practice, to care for patients or clients effectively (Bruce, Klopper & Mellish 2011). In this study, the nurse educator will mean an individual who is qualified to teach nursing programmes, and who is currently teaching at one of the four Gauteng provincial nursing colleges.

5.2. Nursing College

A Nursing College refers to a post-secondary educational institution that offers professional nursing education programmes at basic and post-basic levels, where such education has been

approved in terms of the Nursing Act (SANC 2013). A nursing college in this study is a public nursing institution in the Gauteng Health Department, accredited to offer nursing education in association with a university, and will be referred to as a provincial nursing college throughout the study.

5.3. Research capacity

Research capacity is the ability to conduct quality/useful research and to understand, appraise, utilise and develop research evidence in providing high-quality health care (Segrott et al. 2006; Duffy et al. 2015). In this study the nurse educator's ability to understand, conduct, appraise, utilise and conduct and sustain quality/useful research in an academic setting will be investigated through exploring and describing the nurse educators' current perceived research-skills level.

5.4. Research capacity development need

Rothwell and Kazanas, as cited by Opperman and Meyer (2008), defined development need as 'a performance gap separating what people know, do or feel from what they should know, do or feel to perform competently'. The development need should always be linked to the essential knowledge; skills and attitudes that an individual must possess to perform his/her work competently and thereby accomplish the desired results (Opperman & Meyer 2008). In the context of this study, research-capacity development needs are the knowledge, skills and abilities that need to be developed to conduct quality and useful research in nursing education.

6. Design and Methods

6.1. Research design

A descriptive quantitative cross-sectional survey (Brink, Van der Walt & Van Rensburg 2012) was used to identify and describe the current research capacity and research-capacity development needs of nurse educators within the context of Gauteng provincial nursing colleges in South Africa.

6.2. Population and sampling

Four provincial nursing colleges in Gauteng were included in the study. The accessible population comprised nurse educators (N = 340) working at these nursing colleges. The accessible population, within the inclusion and exclusion criteria, served as the all-inclusive sample for the study. To qualify for inclusion, nurse educators at these colleges had to be employed by these institutions for a period of at least six months, and be willing to answer the questionnaire in English. Nurse educators who were employed for less than six months by these colleges and

those that were not employed by these institutions were excluded from the study. The nurse educators who participated in the pre-test and the main study were (n=13) and (n=124) respectively.

6.3. Data-collection

Data collected in this study was done with a descriptive approach (Grove et al, 2013), utilising a structured self-reporting questionnaire. The descriptive self-reporting questionnaire served to gather empirical evidence on the perceived research capacity and research-capacity needs of nurse educators employed at Gauteng provincial nursing colleges. Data was collected from four Gauteng provincial nursing colleges over a period of three months (September-November 2016). The participants were given seven days to return the informed consent form and completed questionnaires to the mediator. The questionnaire took approximately 30 minutes to complete.

6.3.1. Data collection instrument

The questionnaire was based on previous Norwegian and Australian studies (Akerjordet et al. 2012a) with the same intent of describing nurses' perceived research capacity and research-capacity development needs. Permission to use that questionnaire was obtained. The questionnaire comprised three sections. The demographic section (Section A), was amended to fit the context of the study and consists of nine closed-ended questions that gathered information on the employment and demographic data of the nurse educators. The interest in research and research-needs section (Section B) consisted of 14 questions, of which seven were closed-ended and seven were open-ended questions, and remained the same for this study. The first five questions of Section B focused on the nurse educators' current research engagement. Questions six to nine (Section B) focused on the nurse educators' current overall research skills and research interest. The remaining five questions in Section B (questions ten to 14), were open-ended and focused on the nurse educators' perceived research-development needs in the context of the college setting.

Section C, which focused on the nurse educator's research-skill level, was amended (in consultation with a statistician), as four of the original 59 questions was double-directed questions. The final questionnaire, specifically for Section C, consequently had 63 questions pertaining to research-skills level within the seven different phases of the research process, to give an overall research-capacity description. These were the exploratory phase (7 items), literature review (3 items), design phase (17 items), preparation phase (9 items), action phase (3 items), data analysis (8 items), and writing up (16 items). This section of the questionnaire used a six-point Likert Scale ranging from 'poor' (1) to 'excellent' (5) and 'unsure' (6); the last-mentioned was

included to avoid skewing the data, as some participants might be unsure of their research skill level.

6.3.2 Data-collection procedure

An independent person was employed to facilitate data collection at all the colleges, to ensure objectivity, as the researcher is employed by one of the Gauteng nursing colleges included in the research. The questionnaires were completed anonymously and placed in a sealed box at a convenient place for the participants, and maintained the participants' anonymity and confidentiality. The response rate at, 40.3%, was low.

6.4. Data analysis

A statistician from North-West University was consulted for assistance in analysing the data. Statistical analyses were conducted using the SPSS 24.0. Frequency distribution, descriptive statistics and inferential statistics were used to analyse the variables, describe and synthesise data to address the research question.

All the nurse educators' open-ended responses (ranging from narrative sentences to single words) were captured using Microsoft Excel 2016. The initial coding phase was conducted by the researcher within the Excel spread sheet. After this initial coding phase, the preliminary codes identified from the open-ended questions were deliberated, revised and refined in a face-to-face discussion between the researcher and the supervisor. This approach was followed in ensuring the trustworthiness trough confirmability and dependability of the open-ended responses. Both the preliminary codes and the open-ended responses were then imported into Atlas.ti 8 2018 for managing and further coding and categorising. Open-ended responses from the nurse educators were combined and the frequency of codes was counted to arrange and categorise the collective responses, from least to more important as perceived by the nurse educators. The data was again deliberated between the researcher and the supervisor and consensus was reached.

7. Rigour

7.1. Validity

Pre-testing of the questionnaire was done with 13 participants to enhance the face validity through identifying and rectifying any potential language barriers and any ambiguous instruction or wording specifically for the identified population. The participants were given an opportunity to comment on the questionnaire. Minor language and technical errors were corrected. The previous studies were international studies; thus a Likert scale of 1-6 instead of 1-5 was used for the questionnaire (and 6 being 'unsure'). The aim was to avoid skewing the data. On data analysis,

6 was excluded from the analysis and the focus was on the Likert scale of 1-5 which measured the perceived research-skills level. However, the findings on 6 were reported to outline the unsure responses. Confirmatory factor analysis was conducted on the questionnaire. All items in section C of the questionnaire had standardised regression weights above 0.620. Measurement of goodness fit for the three subscale model yielded a CMIN/DF value of 2.806 which is acceptable. A relatively unacceptable CFI of 0.740 was obtained, and an unacceptable RMSEA value of 0.115 with 90% confidence interval of [0.112; 0.119] was obtained.

7.2. Reliability

The Cronbach Alpha test for the combined factors was 0.947, which is consistent with the previous studies' 0.99 (Gething et al. 2001; Akerjordet et al. 2012a). A factor analysis indicated high Cronbach alphas on all the seven phases of research (Table 1).

TABLE 1: Reliability statistics of the study variables.

Variables	Score range	Mean	SD	Cronbach Alpha	Number of items
Exploratory phase	1 – 5	2.94	0.940	0.930	7
Literacy phase	1 – 5	2.77	0.974	0.888	3
Design phase	1 – 5	2.71	0.988	0.981	17
Preparation for action	1 – 5	2.60	1.005	0.962	9
Action	1 – 5	2.83	1.108	0.961	3
Data analysis	1 – 5	2.48	0.949	0.938	8
Writing up	1 – 5	2.58	1.041	0.982	16

7.3. Trustworthiness

Persistent observation was achieved through reading the open ended questions and capturing all responses accurately. Initial coding was done by the researcher and verified by the supervisor. Data was coded through Atlas.ti 2018 and was validated by the supervisor and co-supervisor to ensure peer debriefing. Detailed description of all categories was done to ensure accurate descriptions of the open-ended data. There were similarities in the research-capacity needs of the participants which demonstrated dependability of the results. Questionnaires that were filled in by the participants are available for confirming the data.

8. Ethical consideration

Before conducting the research, the researcher obtained written permission from the Human Health Research Ethics Committee (HREC) NWU-000374-15-A1 of the North-West University, Directors of the Gauteng Department of Health and principals of the specific nursing colleges. The nurse educators were invited to participate in the study voluntarily and anonymously, and

informed consent was obtained. The nurse educators had a right to withdraw participation in the study at any point. No inherent risks were anticipated for the nurse educators in the study. The nurse educators were given information about the study, including the ethical aspects. Ethical principles were considered throughout the study.

9. Results

The demographic data in Section A of the questionnaire is presented and discussed to describe the demographic characteristics of the nurse educators. Section B describes the research-interest and research-capacity needs of nurse educators through closed-ended and open-ended questions. Section C describes the research-skills levels of the nurse educators within the seven phases of research process. Open-ended results are discussed and supported by the number of times mentioned by the nurse educators and indicated as frequencies (e.g. n=25) in brackets.

9.1. Demographic profile

Of the 137 nurse educators who completed the questionnaires, 131 were female (95.6%), and 5 were male (3.6%), as presented in Table 2. Majority (72.2%) were married and only (26.3%) were single. The age of the nurse educators ranged from 28 to 65 years (*M* = 50.40; SD 8.62). Most of the nurse educators' highest qualification was a bachelor degree (57.7%); only (28.5%) held a Master's degree. The average period worked as nurse educator was (*M* = 10.58; SD 8.83), with an average of (*M* = 6.66; SD 6.16) in the current position, and in the current institution for (*M* = 8.48; SD 7.26). The positions held were PND1 junior lecturers (41.6%), PND2 senior lecturers (51.1%), PND3 Heads of Department (4.4%) and other (0.7%) which was the Principal of one the colleges.

TABLE 2: Participants' Demographic Profile (*N* = 137).

Characteristics	Category	*N*	%
Gender	Male	5	3.6
	Female	131	95.6
	No response	1	0.7
Marital Status	Single	36	26.3
	Married	99	72.2
	No response	2	1.5
Position held	PND 1	57	41.6
	PND 2	70	51.1
	PND 3	6	4.4
	Other	1	0.7
	No response	3	2.2
Highest qualification	Post Basic Diploma in Nursing Education	6	4.4
	Bachelor Degree	79	57.7
	Master's Degree	39	28.5
	Doctorate	0	0
	Other	11	8.0
	No response	2	1.5
Courses teaching	Enrolled nursing	0	0
	Basic Diploma: Bridging and Four-year Diploma	97	70.8
	Post basic diploma	24	17.5
	Other	16	11.7
Descriptive		**Mean**	**SD**
Age		50.40	8.62
Period worked as a nurse educator		10.58	8.83
Period worked in your current position		6.66	6.16
Period worked in your present organisation		8.48	7.26

9.2. Interest in research and research needs

9.2.1. Time used for research, studying towards higher degree and engagement in research

The nurse educators' responses indicated that 55.5% spent 30% or less time on research, and only 25.6% spent 31%->40% of time on research. Of the 29.2% nurse educators that indicated that they were studying towards a higher degree, in the open ended responses the majority (62.5%) indicated that they were studying towards a Master's degree and 35% were studying towards a PhD. (this last-mentioned percentage is interesting as only 28.5% indicated they hold a Master's degree). More than half (51.3%) of the nurse educators studying towards a higher degree were in the proposal stage, while (17.9%) were busy doing research methodology. The remaining nurse educators (30.8%) were all in different stages of their research, ranging from in the process of applying (2.6%) to data analysis (7.7%). More than half – 53.3% – indicated that they were not engaged in research while 46% were engaged in research – of which (n=32)

indicated that they were busy with own studies, (n=29) were engaged in work-related research activities, (n=15) in informal research activities and (n=2) indicated that they were participating in presentations.

TABLE 3: Frequency statistics for research engagement.

Category		N	%
Percentage of time used for research	10% or less	32	23.4
	11-20%	24	17.5
	21-30%	20	14.6
	31-40%	19	13.9
	>40%	16	11.7
	No response	26	19.0
Nurse educators currently studying toward a higher degree	Yes	40	29.2
	No	94	68.6
	No response	3	2.2
Nurse educators currently engaged in research	Yes	63	46
	No	73	53.3
	No response	1	0.7

9.2.2. Current research skills, interest in research and perceived general research-skill level

The majority of nurse educators considered their current research skills as reasonable (*M* = 2.82, SD 0.991), and this was also the case with their perceived independent research skills (*M* = 2.60, SD 1.114). The nurse educators further indicated a strong need to increase their research skills (*M* = 4.11, SD 1.002), and interest in engaging in research (*M* = 4.05, SD 1.050).

TABLE 4: Research interest and perceived general research skills.

Variable	Score Range	Total number of responses n	Mean	SD	Number of unsure responses N
Current research skills	1 – 5	131	2.82	0.991	3
Level of independent research skills	1 – 5	133	2.60	1.114	1
The desire to increase research skills	1 – 5	129	4.11	1.002	5
Interest to engage in research	1 – 5	126	4.05	1.050	8

9.2.3. Research capacity-development needs

To identify and describe the nurse educators' perceived research-capacity development needs, five open-ended questions were included in the questionnaire focusing on their a) perceived

motivational factors for professional development; b) perceived research barriers; c) research priorities for the next two years; d) research capacity enhancement through institutional assistance and e) areas of research-capacity improvement.

9.2.3.1 Nurse educators' motivational factors for professional development

The nurse educators (n=110) who answered this question indicated that they were mainly motivated by renewing clinical competencies (n=34), advancement in knowledge (n=18), career (n=13) and competencies (n=3). Contributing to the nursing profession (n=19), society at large (n=3), nursing research (n=2) and mentoring young students (n=2). Personal growth (n=16) was also indicated as a motivational factor. An interesting finding was that only a few nurse educators were motivated by extrinsic factors such as financial reward (n=6) and professional status (n=4). Although the nurse educators were asked to describe the motivational factors, some nurse educators indicated and highlighted inhibitory factors (n = 20) to their professional development. These included workload (n=12) and lack of support (n=5), lack of interest (n=2) and leadership (n=1). Apart from the inhibiting factors, the nurse educators also indicated their professional development needs (n=19) under this question. These needs included individual-development needs, including skills development (n=10) and collaboration (n=2) and also institutional-support needs (n=7).

9.2.3.2 Research barriers as identified by nurse educators

Regarding the research barriers, the nurse educators identified a total of 230 perceived research barriers; individual (n=140) and institutional research barriers (n=81) were the two main categories and others (n=9). On the individual research barriers, the nurse educators felt that age (n=3), studying (n=3), family and personal commitments (n=8), lack of knowledge (n=10), experience (n=10), mentorship (n=3) and interest (n=4) inhibited their participation in research activities. In addition, lack of time (n=57) and funding (n=41) were viewed by nurse educators as significant individual barriers. It is important to note that lack of time and funding, although categorised under individual barriers, should also be viewed as institutional barriers. Furthermore, the institutional barriers identified were current workload (n=29) and lack of study leave (n=11). Other institutional barriers that were mentioned were the lack of research infrastructure (n=17), the lack of institutional support (n=21), and policies (n=3).

9.2.3.3 Nurse educators' research priorities for the next two years

The open-ended responses indicated that the nurse educators would like to participate in research activities within the next two years. Their prioritised activity was to pursue their own studies (n=59). Other prioritised activities listed were to be more involved in research-related

activities (n=18) and in the publication of articles (n=11). An interesting finding was that there were nurse educators (n=16) who indicated that they had no research priorities for the next two years. Also, 25 of the nurse educators, although not indicating their research priority, did indicate their interest in doing a research project by identifying a research topic in which they were interested. Though this does not reflect the participant's research priorities, it does suggest the participant's keenness to get involved in research.

9.2.3.4 Research capacity enhancement through institutional assistance

The nurse educators' responses on institutional assistance were categorised into three main categories — viz individual, group and institutional-level support. The nurse educators indicated that they needed the institution to grant them study leave (n=37), more time for research involvement (n=35), funding (n=27) and support to attend training programmes such as research workshops (n=15), in-service training (n=10), conferences (n=5) and seminars (n=2). On group support, the nurse educators highlighted that the institution must encourage nurse educators to do and present research (n=13) and establishing journal clubs (n=6). Institutional support was associated with establishing (n=4) and strengthening a research committee (n=4), and providing (n=2) and providing (n=5) improving IT resources (n=2).

The findings on the open-ended questions indicated that the nurse educators were mainly motivated by intrinsic factors, such as the need to achieve certain levels of research competencies and acquiring knowledge to be able to contribute to the nursing profession. Several barriers to research were mentioned, and the support needed to address the barriers were emphasised. The open-ended responses to the above-mentioned questions revealed that the nurse educators were interested in engaging in research and they further indicated their priority development needs for the next two years.

9.2.3.5. Areas of research-skill improvement as identified by nurse educators

To the open-ended question, 'Which areas of research skill do you want to improve?', the nurse educators (n=12) indicated a need to improve their basic theoretical knowledge, and research and the research process (n=14). Most of the nurse educators indicated that they wanted to improve their research skills relating to the design phase (n=31). Other areas mentioned were data analysis (n=29), the writing-up phase (n=24), literature review (n=20), action phase (n=15) exploratory phase (n=17) and preparation phase (n=9).

These findings on the open-ended responses not only support the quantitative findings that the nurse educators perceived their research capacity as reasonable to low in all the phases of research, but also indicate the nurse educators' development needs. These development needs

ranged from theoretical research knowledge to active engagement in research, from the exploratory phase through to the writing-up and publishing of scientific research.

9.3. Research capacity

To measure the nurse educators' research capacity, the research-skills levels in different phases of research were assessed, as presented in Table 5. The overall results on the different research phases indicated that the nurse educators perceived their research capacity as reasonable in all the phases of research, with the highest mean of (*M* = 2.94, SD 0.940) for the exploratory phase and lowest for the data-analysis phase (*M* = 2.48, SD 0.949). However, the standard deviation amongst the items was relatively high >1.000. The results on each phase are reported from high to low, indicating the research areas in which the nurse educators perceived their research ability as being high or low.

For the exploratory phase, the average mean was (*M* = 2.94, SD 0.940). Amongst the seven items in this phase, 'identifying researchable area' was the highest (*M* = 3.19, SD 1.001) while 'locating funds' was the lowest (*M* = 2.06, SD 1.101). The results for the literature review phase indicated that the respondents perceived their research skills as good in terms of accessing relevant literature (*M* = 3.05, SD 1.058) and reasonable in developing a cogent critical synthesis of the literature (*M* = 2.47, SD 1.072). The average mean for this phase was reasonable (*M* = 2.77, SD 0.974). When it came to the design phase, the nurse educators perceived their skills and overall capacity to be good in determining data-collection methods (*M* = 3.08, SD 1.083). All the other items have a mean lower than 3.00, with the lowest mean of (*M* = 2.30, SD 1.057) for balancing precision against feasibility, and the average mean for this phase was also reasonable (*M* = 2.71, SD 0.988). The average mean for the 'preparation for action' phase was (*M* = 2.60, SD 1.005), and the nurse educators perceived their skill of seeking consent from participants as the best (*M* = 3.04, SD 1.137) and the ability to access possible sources of funding was indicated as the poorest (*M* = 2.03, SD 1.004).

The average mean for the action phase was reasonable (*M* = 2.83, SD 1.108) and conducting of interviews scored the highest (*M* = 2.91, SD 1.115). Taking field notes scored the lowest (*M* = 2.76, SD 1.162). The data-analysis phase scored lowest amongst all the research phases (*M* = 2.48, SD 0.949), with 'describing the sampled population' as the best score (*M* = 2.91, SD 1.085) and using a computerised statistical package being the lowest within this phase (*M* = 1.99, SD 1.078). The writing-up phase showed a similar trend of an average mean lower than 3.00 (*M* = 2.58, SD 1.041). The skill at compiling a reference list conforming to acceptable practice was perceived as reasonable (*M* = 2.98, SD 1.376), with 'circulating a research paper to enhance the profile of the researcher' being the poorest (*M* = 2.15, SD 1.076).

TABLE 5: Descriptive statistics about perceived research skill levels

Variables	Score range	Total number of responses	Total number of unsure responses	Missing	Mean	SD
		n (%)	*n* (%)	*n* (%)		
Exploratory phase					**2.94**	**0.940**
1. Identifying researchable areas	1-5	131 (95.6)	3 (2.2)	3 (2.2)	3.19	1.001
2. Assessing the importance of the research area	1-5	129 (94.2)	5 (3.6)	3 (2.2)	3.12	1.058
3. Formulating research question	1-5	132 (96.4)	2 (1.5)	3 (2.2)	2.95	1.148
4. Identifying possible ethical issues	1-5	130 (94.9)	3 (2.2)	4 (2.9)	3.13	1.116
5. Identifying resources required in doing research	1-5	132 (96.4)	2 (1.5)	3 (2.2)	3.08	1.123
6. Identifying available resources	1-5	131 (95.6)	1 (0.7)	5 (3.6)	3.04	1.140
7. Locating funding	1-5	127 (92.7)	5 (3.6)	5 (3.6)	2.06	1.101
Literature review phase					**2.77**	**0.974**
8. Accessing relevant literature	1-5	132 (96.4)	2 (1.5)	3 (2.2)	3.05	1.058
9. Keeping a systemic record of the literature accessed	1-5	129 (94.2)	4 (2.9)	4 (2.9)	2.80	1.071
10. Developing a cogent critical synthesis of the literature	1-5	130 (94.9)	3 (2.2)	4 (2.9)	2.47	1.072
Design phase					**2.71**	**0.988**
11. Determining an appropriate research design	1-5	130 (94.9)	2 (1.5)	5 (3.6)	2.81	1.162
12. Specifying hypothesis/ research questions	1-5	131 (95.6)	2 (1.5)	4 (2.9)	2.73	1.044
13. Specifying independent/ dependent variables	1-5	132 (96.4)	2 (1.5)	3 (2.2)	2.69	1.064
14. Identifying confounding variables	1-5	131 (95.6)	3 (2.2)	3 (2.2)	2.45	1.002
15. Controlling confound variables	1-5	130 (94.9)	3 (2.2)	4 (2.9)	2.41	1.009
16. Determining sample size	1-5	131 (95.6)	3 (2.2)	3 (2.2)	2.93	1.104
17. Determining sample sampling procedure	1-5	131 (95.6)	3 (2.2)	3 (2.2)	2.94	1.115
18. Considering the internal validity of an instrument	1-5	130 (94.9)	3 (2.2)	4 (2.9)	2.55	1.093
19. Considering external validity of an instrument	1-5	131 (95.6)	3 (2.2)	3 (2.2)	2.56	1.082
20. Determining data collection methods	1-5	130 (94.9)	3 (2.2)	4 (2.9)	3.08	1.083
21. Determining data analysis methods	1-5	131 (95.6)	3 (2.2)	3 (2.2)	2.85	1.197
22. Choosing procedure for data collection	1-5	130 (94.9)	4 (2.9)	3 (2.2)	2.95	1.930
23. Choosing a research setting	1-5	130(94.9)	4 (2.9)	3 (2.2)	2.88	1.134
24. Developing instrumentation	1-5	130 (94.9)	4 (2.9)	3 (2.2)	2.54	1.028
25. Piloting the study	1-5	131 (95.6)	3 (2.2)	3 (2.2)	2.79	1.150
26. Balancing precision against feasibility and logistics	1-5	125 (91.2)	6 (4.4)	6 (4.4)	2.30	1.057
27. Developing an interview guide	1-5	126 (92.0)	3 (2.2)	8 (5.8)	2.72	1.129
Preparation for action phase					**2.60**	**1.005**
28. Scheduling activities	1-5	126 (92.0)	3 (2.2)	8 (5.8)	2.72	1.107
29. Preparing a detailed research proposal	1-5	129 (94.2)	3 (2.2)	5 (3.6)	2.71	1.147
30. Seeking the approval of relevant authorities	1-5	127 (92.7)	4 (2.9)	6 (4.4)	2.91	1.185
31. Seeking consent from participants	1-5	127 (92.7)	5 (3.6)	5 (3.6)	3.04	1.137
32. Informing parties of schedule	1-5	122 (89.1)	7 (5.1)	8 (5.8)	2.94	1.138
33. Estimating costs for research	1-5	122 (89.1)	10 (7.3)	5 (3.6)	2.39	1.175
34. Accessing possible sources of funding	1-5	122 (89.1)	8 (5.8)	7 (5.1)	2.03	1.004
35. Training assistance in data collection method	1-5	126 (92.0)	6 (4.4)	5 (3.6)	2.32	1.129
36. Assess inter-rater reliability	1-5	122 (89.1)	8 (5.8)	7 (5.1)	2.16	1.083
Action Phase					**2.83**	**1.108**
37. Conducting interviews	1-5	125 (91.2)	6 (4.4)	6 (4.4)	2.91	1.115
38. Taking field notes	1-5	126 (92.0)	6 (4.4)	5 (3.6)	2.76	1.162
39. Conducting small group interviews	1-5	126 (92.0)	6 (4.4)	5 (3.6)	2.85	1.125

Data Analysis Phase					**2.48**	**0.949**
40. Describing sample population	1-5	125 (91.2)	6 (4.4)	6 (4.4)	2.91	1.085
41. Meeting sampling criteria	1-5	126 (92.0)	5 (3.6)	6 (4.4)	2.76	1.120
42. Applying appropriate statistical techniques	1-5	126 (92.0)	4 (2.9)	7 (5.1)	2.27	1.120
43. Discourse analysis from written text	1-5	125 (91.2)	5 (3.6)	7 (5.1)	2.26	1.048
44. Analysing interview data	1-5	125 (91.2)	6 (4.4)	6 (4.4)	2.60	1.143
45. Editing transcripts	1-5	124 (90.5)	7 (5.1)	6 (4.4)	2.35	1.075
46. Using computerised statistical package(s)	1-5	124 (90.5)	7 (5.1)	6 (4.4)	1.99	1.078
47. Interpreting findings	1-5	123 (89.8)	8 (5.8)	6 (4.4)	2.67	1.083
Writing –up Phase					**2.58**	**1.041**
48. Demonstrating proficiency in written expression	1-5	125 (91.2)	6 (4.4)	6 (4.4)	2.55	1.051
49. Using textual citation according to an accepted reference system	1-5	124 (90.5)	6 (4.4)	7 (5.1)	2.60	1.126
50. Presenting findings clearly and comprehensively	1-5	122 (89.1)	7 (5.1)	8 (5.8)	2.57	1.142
51. Reporting on the findings in relation hypotheses/objectives	1-5	124 (90.5)	7 (5.1)	6 (4.4)	2.81	1.205
52. Comparing research findings with earlier studies	1-5	122 (89.1)	8 (5.8)	7 (5.1)	2.68	1.085
53. Determining implications	1-5	123 (89.8)	7 (5.1)	7 (5.1)	2.63	1.081
54. Identifying limitations	1-5	124 (90.5)	7 (5.1)	6 (4.4)	2.80	1.169
55. Identifying themes in the qualitative data	1-5	121 (88.3)	9 (6.6)	7 (5.1)	2.57	1.109
56. Making abstractions based on data	1-5	122 (89.1)	8 (5.8)	7 (5.1)	2.37	1.054
57. Making suggestions for further research	1-5	123 (89.8)	6 (4.4)	8 (5.8)	2.83	1.171
58. Compiling a reference list conforming to the accepted practice	1-5	124 (90.5)	7 (5.1)	6 (4.4)	2.98	1.376
59. Deciding how to publish material	1-5	122 (89.1)	9 (6.6)	6 (4.4)	2.23	1.134
60. Targeting an audience for the research report	1-5	124 (90.5)	7 (5.1)	6 (4.4)	2.55	1.185
61. Tailoring final report according to the audience	1-5	122 (89.1)	9 (6.6)	6 (4.4)	2.40	1.147
62. Submitting a report for consideration/publication	1-5	125 (91.2)	6 (4.4)	6 (4.4)	2.23	1.151
63. Circulating paper to enhance profile as a researcher	1-5	123 (89.8)	7 (5.1)	7 (5.1)	2.15	1.076

9.4 Correlations and associations

Considering the descriptive nature of the study, further correlational and association analysis was done to add deeper descriptions to the findings (table 6). The ‘demographic variables’ and ‘interest in research variables’ were correlated with the seven dimensions of the research-skill phases to identify possible significant relationship, through bivariate two-tailed nonparametric correlation. T-test analysis was done to compare the means of the biographical data, research interest and research engagement with that of the research-skill level of the nurse educators.

TABLE 6: Summary table of correlations for the sample (n=137)

Variables	1	2	3	4	5	6	7
Age	0.149	0.135	0.142	0.075	0.152	0.076	0.096
Position held	0.272**	0.126	0.228**	0.184**	0.221**	0.124	0.200*
Highest qualification	0.372**	0.292**	0.334**	0.298**	0.264**	0.288**	0.366**
Years worked as a nurse educator	0.219*	0.201*	0.185*	0.179*	0.195*	0.099	0.210*
Years worked in present position	0.233**	0.192*	0.203*	0.160	0.127	0.092	0.171
Years worked in present organisation	0.295**	0.253**	0.220*	0.219*	0.232**	0.169	0.235**
Percentage of time used for research	0.441**	0.327**	0.402**	0.365**	0.269**	0.297**	0.386**
Current research skill level	0.780**	0.678**	0.717**	0.644**	0.548**	0.584**	0.644**
Level of independent research skill as a researcher	0.815**	0.685**	0.733**	0.693**	0.573**	0.623**	0.695**
Desire to increase your research skill	0.258**	0.169	0.214*	0.193*	0.081	0.088	0.112
Interest to engage in research	0.250**	0.201*	0.245**	0.229*	0.144	0.147	0.148
1. Exploratory phase	–	–	–	–	–	–	–
2. Literature review phase	0.763**	–	–	–	–	–	–
3. Design phase	0.871**	0.808**	–	–	–	–	–
4. Preparation for action phase	0.782**	0.793**	0.886**	–	–	–	–
5. Action Phase	0.639**	0.734**	0.762**	0.813**	–	–	–
6. Data Analysis Phase	0.731**	0.800**	0.861**	0.852**	0.830**	–	–
7. Writing –up Phase	0.778**	0.855**	0.868**	0.886**	0.816**	0.899**	–

** Statistically significant where $p < 0.01$
* Statistically significant where $p < 0.01$

In general, the seven dimensions of research-skills phases had positive correlations with the demographic variables, research interest and research engagement. 'Current research level' and 'level of independent research' showed the highest positive correlations. 'Current research-skills level' had high positive correlations with all dimensions of research-skills levels: exploratory ($r = 0.780$, $p < 0.01$), design phase ($r = 0.717$, $p < 0.01$), literature review phase ($r = 0.678$, $p < 0.01$), preparation ($r = 0.644$, $p < 0.01$) writing-up phase ($r = 0.644$, $p < 0.01$), data analysis ($r = 0.564$, $p < 0.01$) and action phase ($r=0.543$, $p<0.01$). 'Level of independent research skills as a researcher' showed large correlations with all dimensions of research-skills levels: exploratory phase ($r = 0.815$, $p < 0.01$), design phase ($r = 0.733$, $p < 0.01$), writing-up phase ($r = 0.695$, $p < 0.01$), preparation ($r = 0.693$, $p < 0.01$), literature phase ($r = 0.685$, $p < 0.01$), data analysis ($r = 0.623$, $p < 0.01$) and action phase ($r = 0.573$, $p < 0.01$). The independent T-test interpretation

focussed on effect sizes and practical significance rather than statistical significance. The findings revealed that there was a practically visible, statistically significant difference in the mean of gender and exploratory phase factor (3.5143 > 2.9080) (d value = 0.66), research engagement and exploratory phase factor (3.3086 > 2.5820) (d value = 0.66), design phase factor (3.0135 > 2.4281) (d value = 0.60), and preparation phase factor (2.9429 > 2.2911) (d value = 0.67).

The results show that the nurse educators indicated their 'engagement in research' was significantly higher for the exploratory, design and preparation phases. The male nurse educators' research skill for the exploratory phase was significantly higher than the female nurse educators'. There was no significant association between the other variable. The sample size was small and the study context specific, and therefore there should be caution that, even though significant correlations and associations were established among these variables, further empirical investigation is needed, including further validity and reliability testing of the questionnaire used.

10. Discussion

This study described the current research capacity and research-capacity development needs as perceived by the nurse educators employed in provincial nursing colleges at the time this study was conducted. The nurse educators that participated in the study were 131 females (95.6%), and five (3.6%) males, as presented in Table 2. The study featured a high number of females because nursing is dominated by women (Roets & Bhembe 2016). However, even though nursing education is dominated by females, according to Masika et al. (2014:53) women produced less research. One of the main barriers for women is family commitments (Masika et al. 2014). Comparably, in this study, the majority (72.2%) of nurse educators were married, (n=8) respondents also indicated personal and/or family obligations as a barrier.

In a study conducted by Mulder and Uys (2013:6) at provincial nursing colleges, demographic profiling revealed that 25% of nurse educators were senior lecturers or higher, with an average of 10 years' teaching experience, and the majority of nurse educators (59%) have bachelor degrees and 23% have an Honours qualification and above. In this study, a similar trend was observed regarding years of experience and academic qualifications. More than half (51.1%) of the nurse educators were senior lecturers, with similarity in average years (10.5) of teaching experience. Similarly, a lower number (28.5%) (n=39) of the nurse educators that participated in the study had a Master's degree, none had a PhD qualification and the majority (57.7%) had a bachelor's degree. International and national studies emphasise that academic qualifications (Oprescu et al. 2017), research skills (Roets & Bhembe 2016), and general research knowledge (Gullick & West 2016) are fundamental elements of individual research capacity. In this study, 29.1% (n=40) of nurse educators were studying towards higher degrees. This indicates that there

is still a high number of nurse educators at provincial nursing colleges that do not have higher degree qualifications – and, also, more than half (55.9%) were not improving their qualifications. By comparison, Mulder and Uys (2013:6) found that a higher number (55%) of nurse educators in KwaZulu-Natal provincial nursing colleges were engaged in formal studies. Enrolment in further formal studies is viewed as a good foundation to encourage future research involvement of nurse educators (Mulder & Uys 2013; Oprescu et al. 2017).

The majority of nurse educators viewed their research capacity as reasonable in all phases of research. These results are comparable with the findings of Gething and Leelarthaepin (2000:149), which found the majority of nursing academics perceived their research skills as reasonable or poor and only 10% reported their research skills as very good or excellent. The five research activities that were rated lowest within the phases were: using computerised statistics (*M* = 1.99, SD 1.078), accessing possible sources of funding (*M* = 2.03, SD 1.005), locating funds (*M* = 2.06, SD 1.101), assessing inter-rater reliability (*M* = 2.16, SD 1.083), and circulating paper(s) to enhance profile as a researcher (*M* = 2.15, SD 1.076). The findings were similar to some degree with those of previous studies. In a study conducted by Akerjordet et al (2012a:829), the registered nurses perceived their research capacity as low in assessing inter-rater reliability; piloting the instrument for reliability, sensitivity and specificity; identifying and considering controlling cofound variables; locating sources of funding; and using computerised statistics. The five highest-ranked areas of research capacity were identifying a researchable problem (*M* = 3.19, SD 1.001), identifying possible ethical issues (*M* = 3.13, SD 1.116), assessing importance of research area (*M* = 3.12, SD 1.058), and identifying resources required in doing research (*M* = 3.08, SD 1.123). Proficiency in research skills differs according to individual research experience and academic qualifications (Gething et al. 2001) and their study results showed that nurses ranked themselves high in accessing and using literature. In addition, Akerjordet et al (2012a:829) found that registered nurses rated themselves high in considering ethical issues, conducting interviews, accessing literature, keeping systematic records of published literature accessed, and taking field notes. However, in this study, nurses indicated that they were not proficient in taking field notes. The results from the different studies show that individual research-skills levels differ in each context. Understanding the knowledge and skills level of the target population is necessary in planning research-capacity development initiatives (Edward, Kaseje & Kahwa 2016).

Studies conducted by Levine et al. (2013:2) and Duffy (2015:159) identified a positive attitude towards research as an essential predictor for an individual participating in research. Although fewer nurses were involved in research activities, findings further indicated that the majority of the nurse educators were aware that their independent research skills (*M* = 2.60, SD 1.114) were

reasonable, with the majority indicating a strong desire to increase their research skills (*M* = 4.11, SD, 1.002) and the majority interested in engaging in research (*M* = 4.05, SD 1.050). The combination of the low number of higher degree qualifications and the high number of research-inactive nurse educators revealed by this study indicates a significant concern. Mulder & Uys (2013:6) and Roets & Lubbe (2014:3) also identified this trend at provincial nursing colleges. The research inactivity is further attributed to the fact that research is not recognised as one of the key performance areas of nurse educators at provincial nursing colleges. Thus the combination of research-inactive and low qualifications will influence the research capacity of the nurse educators.

The open-ended results also showed that the participating nurse educators wanted to improve their research skills, in all the phases of research – the highest being research design (n=31) and data analysis (n=29). These findings are supported by an Australian study (Gething et al., 2001:231) that found similar results; nurses desired to improve their research skills on statistical analysis (68.8%) and research design (67%). Supporting the nurse educators in this goal is vital, as several studies have indicated that most nurse educators who transit to HEIs fail to cope with the workload because they have not been prepared for the role (Wyllie et al. 2016 & Murray 2013) and for research (Quimbo & Sulabo 2014).

Both international (Asuquo et al*.* 2013; Segrott et al*.* 2006) and national (Uys & Klopper 2014) literature identifies the need to address research barriers for research-capacity development needs. The research barriers identified by the nurse educators were consistent with other previous studies (Akerjordet et al 2012b; Gething et al. 2001; Roets & Bhembe, 2016). The nurse educators cited lack of time (n=57), funding (n=41), workload (n=29), infrastructure (n=17) and study leave (n=11) as the main research barriers. The majority (29.9%) of the nurse educators who were involved in research indicated that they were studying towards a higher degree. In a recent study, lack of time and heavy workload were mentioned as the main challenges experienced by postgraduate nursing students (Havenga & Sengane 2018). The issue of the lack of time to participate in research was supported by the low number (25.6%) of nurse educators that met the recommended 35% of time spent on research by academics. A study conducted by Gething and Leelarthaepin (2000:149) also showed that, internationally, only 13.3% met the expected standards. The lack of time to study may prolong the period of study or the nurse educators may fail to cope with their studies (Havenga & Sengane 2018). Qualifications are viewed as essential and fundamental to building the research capacity of nurse educators in provincial nursing colleges (Asuquo et al*.* 2013, Mulder & Uys, 2013, Quimbo & Sulabo 2014). The nurse educators also seem to share this view because, when indicating their priority for the next two years, obtaining a higher degree qualification was top of the list (n=55). Thus academic

qualification is viewed as an essential factor to enhance research productivity, leading to improved research capacity (Uys & Klopper 2014).

Other than upgrading qualifications, the nurse educators also mentioned that they would like to be involved in research-related activities (n=18) and publication of an article (n=11) in the next two years. However, there were a few (n=10) that indicated that they do not have any research priorities in the next two years. A study conducted by Oprescu et al. (2017:166) also found that nurse educators were interested in engaging in research activities and further revealed that less than 10% of the nurse educators perceived themselves as expert nurse educators and that only 45% were confident in their skills as nurse educators. The results of this study also showed that, despite the perceived barriers, the respondents mentioned that they were mainly motivated by renewed clinical competencies (n=34), advancement in knowledge (n=18) and contributing to the nursing profession (n=19). These factors are strongly associated with the intrinsic motivation that was identified by Akerjordet et al. (2012b:816). Only a few nurse educators were motivated by extrinsic factors such as financial reward (n=6) and professional status (n=4). It is important to note that the motivational factors are based on individual needs — and in order to identify more individualised research-capacity development needs, an individually-based assessment must be done. This is however not the focus of this study, and the findings should be viewed as a contextual-specific descriptive account of the nurse educators' perceived motivational factors. and should not be generalised.

In the international literature on nursing and capacity-building, training is a key way in which research capacity is built and through which nurses can develop the knowledge and skills to engage in research, compete for funding, and implement evidence-informed practice (Sheehan et al. 2015). An understanding of the research-capacity needs of nurse educators is especially needed for designing strategies for or implementing interventions in nursing colleges (Oprescu et al. 2017), as these colleges prepare to transit to higher education. The nurse educators wanted support on the identified research-capacity development needs, particularly with study leave (n=37), time to be involved in research (n=35), funding (n=27), encouragement to do research (n=13), resources (n=12), and support groups or journal clubs (n=6). Nurse educators also wanted support to attend training programmes such as workshops (n=15) and in-service training (n=10). Nurse educators also highlighted the need for the institution to establish(n=4) and support research committees (n=4). Studies conducted by Roets and Bhembe (2016:216) and Quimbo and Sulabo (2014:1955) emphasised the fact that a scholarly culture that contributes to research capacity is one that enables and supports creative work, offers on-going and diverse developmental-learning activities, affords adequate resources, and provides nurse educators with opportunities to interact and participate in research. The nurse educators may fail to meet

research expectations because of co-existing gaps in research preparation (lack of skills and knowledge), infrastructure, and policy documents that do not necessarily translate into research activity (Gullick & West 2016). Therefore, the provincial nursing colleges need to address the identified research-capacity needs if they expect nurse educators to be productive in research.

The nurse educators generally perceived their research capacity to be reasonable, and identified the needs to improve research skills in a variety of research areas. These findings strongly suggested the research capacity of nurse educators at provincial nursing colleges is not good, and that a multi-pronged strategy is required to assist nurse educators at different levels of research involvement and experience (Gething et al. 2001). Thus, what is required is association between the identified research-capacity needs and a model for building research capacity in the nursing colleges.

11. Conclusions

The objectives of the study were designed for Gauteng provincial nursing colleges, but the results of the study could provide lessons for the provincial nursing colleges in other provinces. The study identified that nurse educators in the provincial nursing colleges viewed their research capacity as reasonable across all phases of research. On the open-ended questions, nurse educators described the support needed to assist them to develop across all the phases of research. Therefore, data from the open-ended questions revealed eye-opening suggestions about the support that can be given to these nurse educators, to improve their research capacity.

12. Limitations

According to Grove *et al*. (2013:598), the limitation of the study refers to restrictions or problems in the study that could potentially reduce the generalizability of findings. Limitations of this study include limited literature on research capacity and research-capacity needs of nurse educators in the context of South Africa, and particularly in provincial nursing colleges. In the national literature, there was more reference to university settings than provincial nursing colleges. There was a poor response rate on the questionnaire, despite all measures taken to improve response rate. However, most nursing studies are subjected to this limitation because of poor response rates associated with survey research (Kruss, Genevieve & Visser 2016; Oprescu et al. 2017). The questionnaire showed high levels of content validity and reliability which implies that, given the sample size of this study and the possibility that there might be too many items in Section C, the study results should be read with caution. Hence, the findings cannot be generalised and further empirical research on both the topic and questionnaire is recommended.

13. Recommendations for further research

The results, based on the description of the nurse educators' research capacity and research-capacity development needs, show that the majority of the nurse educators do not have higher degree qualifications, which is fundamental for them to participate in research. Based on the findings, it is advisable that the provincial nursing colleges should encourage and support nurse educators to do a Master's degree. Support could be offered by reviewing the existing institutional study leave policy, for example, granting sabbatical leave for higher degrees. The provincial nursing colleges should consider supporting and encouraging the nurse educators to conduct research. This could be done by allocating funds within the existing staff-development plan earmarked for research activities such as publication, attending workshops, seminars and conferences. Also, upgraded infrastructure, such as library facilities and internet access, may enable nurse educators to access information. The provincial nursing colleges need to support ethics research committees. The performance management system could be revised and incorporate research activities as one of the key performance areas, in order to ensure that the nurse educators comply with the requirements of the Higher Education Act 101 in the near future. To ensure success of the performance management system, a policy on workload distribution could be formulated to balance teaching and research time. It is recommended that further intervention research be conducted on implementation of strategies to build the research capacity of nurse educators at provincial nursing colleges. Nurse educators cited several issues as institutional barriers, thus research could be conducted to establish the current research-capacity needs of the provincial nursing colleges.

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15. Competing interests

The authors declare that there is no financial or personal relationship which may have inappropriately influenced them in writing this article.

16. Authors' contributions

F.M.D. designed the study and collected and analysed the data under the supervision of F.W. and R.V. who contributed substantially to the intellectual content and finalisation of the manuscript. All authors read and approved the final manuscript.

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CHAPTER 4: EVALUATION OF THE STUDY, LIMITATIONS, AND RECOMMENDATIONS FOR NURSING PRACTICE, EDUCATION AND RESEARCH

4.1 Introduction

This chapter provides an evaluation of the study, discusses its limitations, and offers recommendations for nursing practice, education and research based on the study findings.

4.2 Evaluation of the study

The study was conducted in partial fulfilment of the requirement for the degree, Magister in Nursing Science. The researcher endeavoured to master fundamental aspects of research and aimed through the project to demonstrate a deeper understanding of (and confidence in) the application of research process.

A need for the study was acknowledged when literature revealed that research capacity is an essential element of the research productivity of academic staff at HEIs. The research capacity of academics in HEIs has been explored nationally and internationally. The literature studies revealed that most of the studies dealt with universities, not nursing colleges. Therefore, there is a paucity of published data on the research capacity and research-capacity development needs of South African nurse educators at nursing colleges. Most of the literature emphasised that, in order to determine which strategies should be selected to build the research capacity of individuals; the first step was to map current capacity (and include details of the nature and extent of staff research-training needs). Therefore, this study aimed to gain a deeper understanding of the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

In order to achieve the aim of the study, the following research objective was set out: to identify and describe the current research capacity and research-capacity development needs of the nurse educators at Gauteng provincial nursing colleges in South Africa.

In order to achieve this objective, a descriptive quantitative, cross-sectional survey design was used to provide a deeper understanding of the current research capacity and research-capacity development needs of nurse educators. The advantage of this design was that it allowed data collection in a short period of time. The research was conducted at the four Gauteng provincial nursing colleges, in South Africa. The researcher selected these nursing colleges for reasons including accessibility (regarding travel distance), financial practicalities and time-frame for data

collection. An all-inclusive sample was used, and the nurse educators who participated in the pre-study were (n=13). The questionnaire used to gather data was based on previous studies, and it was reliable. Permission to conduct research was obtained from the Human Health Research Ethics Committee (HREC) NWU-000374-15-A1 of the North-West University, Directors of the Gauteng Department of Health and principals of the nursing colleges. All ethical issues were observed throughout the research process. Nurse educators participated voluntarily in the study, information was given in order to make informed decisions, confidentiality and privacy were maintained and there was no risk for participants. Data collection was completed within a period of three months and the response rate was 40.3% despite all measures taken to improve it. The quantitative data was analysed by a statistician using the SPSS 24.0. Frequency distribution, descriptive statistics, inferential statistics were used to analyse the variables, describe and synthesise data in order to address the research question. Open-ended questions were analysed and trustworthiness was ensured through conformability and dependability of the open-ended responses.

In order to evaluate whether the objective of the study was achieved, the summary of research findings must be outlined. Results showed that the majority of nurse educators that participated in the study were female and married. These two factors may affect the research output of the nurse educators – as studies show that, even though the nursing profession is dominated by females, research output from males is higher than that of females. One of the barriers highlighted in literature is female nurses' family commitments. In the demographic profile, another interesting finding was that the majority of nurse educators have bachelor's degrees; however, less than one third were studying towards higher degrees. This implies that the research capacity of nurse educators may be related to lack of higher degree qualifications, as international and national literature emphasized that Master's and PhD degrees are predictors for research productivity.

The nurse educators perceived their research capacity as reasonable for all phases of research with the best mean in the exploratory phase (*M* = 2.94, SD 0.940) and poorest in the data-analysis phase (*M* = 2.48, SD 0.949). The five research activities that were rated lowest within the phases were: using computerised statistics, accessing possible sources of funding (*M* = 2.03, SD 1.005), locating funds (*M* = 2.06, SD 1.101), assessing inter-rater reliability (*M* = 2.16, SD 1.083), and circulating paper to enhance profile as a researcher (*M* = 2.15, SD 1.076). The five highest-ranked areas of research capacity were identifying a researchable problem (*M* = 3.19, SD 1.001), identifying possible ethical issues (*M* = 3.13, SD 1.116), assessing importance of research area (*M* = 3.12, SD 1.058), and identifying resources required in doing research (*M* = 3.08, SD 1.083). The results from the different studies show that individual research-skill levels differ in each

context. Thus the analysis of research needs is essential in planning research-capacity development initiatives (Edward, Kaseje & Kahwa 2016).

The responses to the open-ended questions provided useful suggestions on the research-capacity needs of the nurse educators in the provincial nursing colleges. The results showed that the nurse educators were mainly motivated by factors, such as renewing clinical skills and contributing to the profession. However, nurse educators cited several barriers that hindered their participation in research activities. The research barriers that were cited were lack of time, funds, infrastructure and study leave, as well as heavy workload. Despite the barriers, and the fact that more than half of the nurse educators were not involved in research, the nurse educators were highly interested in participating in research activities and believed that their research-skill levels were reasonable. The nurse educators indicated that they needed institutional support - which they listed as study leave, time to do research, funding, training programmes, resources, establishment and support of research committees and journal clubs. The open-ended questions not only provided some answers on research-capacity needs as perceived by nurse educators employed by provincial nursing colleges, but also identified the individual, group and institutional support that would assist provincial nursing colleges to build the research capacity of the nurse educators.

The objective of the study focused on Gauteng provincial nursing colleges but the results of the study, especially the recommendation, could provide some insight for provincial nursing colleges in other provinces. The study revealed that nurse educators at the provincial nursing colleges viewed their research capacity as reasonable across all phases of research activity.In the responses to the open-ended questions, nurse educators described the support required to assist them in developing skills across all the phases of research. Therefore, data from the open ended questions revealed both surprising and known suggestions about the support that can be given to these nurse educators, to improve their research capacity.

4.3 Limitations

According to Grove, *et al*. (2013:598), the limitation of the study refers to restrictions or problems in the study that could potentially reduce the generalizability of findings. Limitations of this study include a paucity of literature on research capacity and research-capacity needs of nurse educators in South Africa and particularly at provincial nursing colleges. The available research more often deals with a university setting, or with countries outside South Africa. Another limitation is the poor response rate, despite all measures taken to improve that. However, most nursing studies are subjected to limitation by the poor response rates associated with survey research (Kruss, Genevieve & Visser, 2016; Oprescu et al., 2017). The questionnaire had a relatively

unacceptable CFI of 0.740 and RMSEA value of 0.115 with 90% confidence interval of [0.112; 0.119] indicated that it contained too many items, and this implies that the results of this study should be read with caution and cannot be generalised with confidence.

4.4 Recommendations

Grove *et al*., (2013:599) suggest that recommendations should provide direction for practice and for future research. The notions and suggestions that emerged from this study reinforce the findings of the previous studies; and provide recommendations to improve nursing education practices and form a base for future research on the same topic or related subject field.

The recommendations from this study discussed below may provide direction for practice implementation and/or future research.

4.4.1 Recommendation for nursing education

- It is advisable that the provincial nursing colleges should encourage and support the nurse educators to do a Master's degree.
- The provincial nursing colleges should motivate more nurse educators to do research by providing funds for research activities such as study leave, publication, and attending workshops, seminars and conferences.
- The provincial nursing colleges should consider including attendance of research-related workshops, in-service training and seminars as part the existing staff-development plan.
- The provincial nursing colleges should consider upgrading infrastructure such as library facilities and internet access to enable nurse educators to access information.
- Nursing colleges should also consider addressing the concerns of nurse educators, such as heavy workload, that hinder participation in research activities.
- Nursing colleges need to consider supporting ethics research committees within the institutions.

4.4.2 Recommendation for research

- Intervention research should be conducted on the implementation of strategies to build the research capacity of nurse educators at provincial nursing colleges.
- Research could be conducted on the success rate over the last five years, of the nurse educators employed by provincial nursing colleges who are studying towards higher degrees. The outcome of such research could be a good indicator of the state of readiness of the provincial nurse educators to be transferred to HEIs.

4.4.3 Recommendation for policy

- The existing institutional study-leave policy could be revised to accommodate research activities, for example, granting of sabbatical leave.
- Policy and guidelines on workload distribution could be formulated to balance teaching and research time.
- The performance management system could be revised and incorporate research activities as one of the key performance areas, in order to ensure that the nurse educators comply with the requirements of the Higher Education Act 101.

4.5 Summary

The aim of this study was to gain a deeper understanding of the current research capacity and research-capacity development needs of nurse educators at Gauteng provincial nursing colleges in South Africa. The study provided a broader understanding, through the identification and descriptions, of the current research capacity and research-capacity development needs of nurse educators employed by these colleges through a descriptive, cross-sectional survey design. The findings, in summary, revealed that the nurse educators perceived their research capacity as reasonable in all phases of research, with the best mean in the exploratory phase and poorest in the data-analysis phase. The nurse educators also shared their need for institutional support, by making direct reference to time and funding in order to pursue their own studies and other research activities. The nurse educators further indicated high levels of interested in improving their current research skills within the different phases of research process.

Based on these empirical findings, provincial nursing colleges should consider providing a favourable research environment that enables the nurse educators to participate in research activities. Such an environment, according to the findings, could be achieved by supporting and encouraging the nurse educators to conduct research. Provincial nursing colleges should consider formulating institutional research policies that address funding for publication, research as a key performance area for promotion, and study leave for research activities. It is expected that nursing colleges will be higher education institutions by 2020. Thus, by incorporating the findings and recommendations of this study, provincial nursing colleges might be able to prepare the nurse educators for their new envisaged role as nursing researchers.

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Department of Higher Education and Training **see** South Africa. Department of Higher Education and Training

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ANNEXURES

Annexure A1: Permission to conduct the study institutional research ethics regulatory committee

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom,
South Africa, 2520

Tel: (018) 299-4900
Faks: (018) 299-4910
Web: http://www.nwu.ac.za

Institutional Research Ethics Regulatory Committee
Tel: +27 18 299 4849
Email : Ethics@nwu.ac.za

2016/09/02

ETHICS APPROVAL CERTIFICATE OF STUDY

Based on approval by **Health Research Ethics Committee (HREC),** after being reviewed at the meeting held on **19/11/2015**, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby **approves** your study as indicated below. This implies that the NWU-IRERC grants its permission that provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa.

Study Leader/Supervisor: **Mr FG Watson**
Student: **FM Dhladhla**

Ethics number:

N	W	U	-	0	0	3	7	4	-	1	5	-	A	1
Institution				Study Number						Year			Status	

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Single study
Commencement date: 2016-07-28 **Risk:** Minimal

Continuation of the study is dependent on receipt of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation up to a maximum period of three years.

Special conditions of the approval (if applicable):

- Translation of the informed consent document to the languages applicable to the study participants should be submitted to the HREC (if applicable).
- Any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the HREC. Ethics approval is required BEFORE approval can be obtained from these authorities.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- *The study leader (principle investigator) must report in the prescribed format to the NWU-IRERC via HREC:*
  - *annually (or as otherwise requested) on the monitoring of the study, and upon completion of the study*
  - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The approval applies strictly to the proposal as stipulated in the application form. Would any changes to the proposal be deemed necessary during the course of the study, the study leader must apply for approval of these amendments at the HREC, prior to implementation. Would there be deviated from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *The date of approval indicates the first date that the study may be started.*
- *In the interest of ethical responsibility the NWU-IRERC and HREC retains the right to:*
  - *request access to any information or data at any time during the course or after completion of the study;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the study are revealed or suspected,*
    - *it becomes apparent that any relevant information was withheld from the HREC or that information has been false or misrepresented,*
    - *the required amendments, annual (or otherwise stipulated) report and reporting of adverse events or incidents was not done in a timely manner and accurately,*
    - *new institutional rules, national legislation or international conventions deem it necessary.*
- *HREC can be contacted for further information or any report templates via Ethics-HRECApply@nwu.ac.za or 018 299 1206.*

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the IRERC or HREC for any further enquiries or requests for assistance.

Yours sincerely

Prof LA Du Plessis

Digitally signed by Prof LA Du Plessis
Date: 2016.09.05 17:30:10 +02'00'

Prof Linda du Plessis
Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)

Annexure A2: Approval of amendments

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Private Bag X6001, Potchefstroom
South Africa 2520

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Faculty of Health Sciences
Health Sciences Ethics Office for Research, Training and Support
Health Research Ethics Committee (HREC)

Tel: 018-285 2291
Email: Wayne.Towers@nwu.ac.za

5 September 2016

Mr FG Watson
Nursing

Dear Mr Watson

APPROVAL OF YOUR AMENDMENT REQUEST BY THE HEALTH RESEARCH ETHICS COMMITTEE (HREC) OF THE FACULTY OF HEALTH SCIENCES

Ethics number: NWU-00374-15-A1

Kindly use the ethics reference number provided above in all correspondence or documents submitted to the Health Research Ethics Committee (HREC) secretariat.

Study title: Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa

Study leader/supervisor: Mr FG Watson

Student: FM Dhladhla

The Health Research Ethics Committee (HREC) has reviewed your amendment request for the aforementioned study via the expedited review process. We thus approve the requested changes to the pre-test and pilot phase of the study as well as the minor typographical changes made to the questionnaire and the informed consent forms.
Please inform us immediately if there are any further amendments required to your study. If there are any queries, please let us know at your earliest convenience.

Yours sincerely

Dr Wayne Towers
HREC Chairperson

Prof Minrie Greeff
Ethics Office Head

Annexure B: permission from Gauteng Department of Health

ANNEXURE A: Application letter to Gauteng of Department Health

P.O. Box 3696
Southgate
2082
February 2016

Gauteng Department of Health and Social Development
Private bag X35
Johannesburg
2000

Sir /Madam

Re: Permission to Conduct Research

I hereby request permission to conduct research at Gauteng provincial nursing colleges on **"Research capacity of nurse educators at provincial nursing colleges in Gauteng, South Africa".**

I am a student at North West University studying Masters in Nursing Education. I am required to conduct research and submit a dissertation as a requirement for my study. The aim of this study is to identify and describe the research capacity and research capacity needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

The questionnaires will be distributed to all nurse educators who are willing to participate in the study. Based on the findings of this study the recommendations will be made on strategies to enhance or maintain the research capacity in nursing colleges. The final report will be made available after the study.

Find attached research proposal, ethical clearance and the draft of the questionnaires indicating the type of data to be collected.

Yours sincerely

FM Dhladhla
Telephone: 012 420 1006
Mobile [redacted]
Email: fikiledh@gmail.com

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

OUTCOME OF PROVINCIAL PROTOCOL REVIEW COMMITTEE (PPRC)

Researcher's Name (Principal Investigator)	Mrs Fikile Dhladhla
Organization / Institution	North West University
Research Title	Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa.
Contact number	Address: N/A Contact no: 012 420 1006 Cell: 0794940690 Email: fikiledh@gmail.com
Protocol number	GP_2016RP17_997
Date submitted	26/02/2016
Date reviewed	10/05/2016
Outcome	Approved

It is a pleasure to inform you that the Gauteng Health Department has approved your research on Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa.

Study sites: GDoH Offices

The Provincial Protocol Review Committee kindly requests that you to submit a report after completion of your study and present your findings to the Gauteng Health Department.

Recommended/Not Recommended

Dr. B. Ikalafeng
(on behalf of the PPRC)
Date: 11/05/2016

Approved/Not approved

Dr. LRR Lebethe
DDG: Clinical Service
Date: 18 05 2016

Annexure C1: Permission from provincial nursing college no. 1

P.O. Box 3696
Southgate
2082
24 May 2016

The Principal
Ann Latsky Nursing College
Private Bag X 40
Auckland Park
2006

Dear Mrs Ramahlafi

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH

I hereby request permission to conduct research at Ann Latsky Nursing College on the "**Research capacity of nurse educators at provincial nursing colleges in Gauteng, South Africa**".
I am a student at North West University, studying Masters in Nursing Education. I am required to conduct research and submit a dissertation as a requirement for my study. The aim of this study is to identify and describe the research capacity and research capacity needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

The questionnaires will be distributed to all nurse educators who are willing to participate in the study. Based on the findings of this study the recommendations will be made on strategies to enhance or maintain the research capacity in nursing colleges. The final report will be made available after the study.

Please find the attached ethical clearances, questionnaire and information leaflet. I would like to commence the data collection phase in June 2016 in order to meet deadlines for the current academic year. Thus I would appreciate it if I could get the response as soon as possible so that I could be able to submit to the HREC for full approval.

Yours sincerely

F.M. Dhladhla
Telephone: 012 420 1006
Mobile: [redacted]
Email: fikiledh@gmail.com

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Enquiries: Mrs. M.T. Selebogo
(Acting Research Chairperson)
Tel. No.: (011) 644 8951
Fax No.: (011) 726 2619

9 June 2015

Ref. No.: 2/9/1

To: **Ms. F.M. Dhladhla**
North West University
Research Student

Dear Ms Dhladhla

PERMISSION TO CONDUCT RESEARCH

In response to your letter dated the 24 May 2016, permission is granted for you to collect data for your research study on "Research Capacity of Nurse Educators at Provincial Nursing Colleges in Gauteng, South Africa".

Ann Latsky Nursing College has ± 104 (hundred and four) lecturers who are at both clinical areas and at the College for the distribution of your Questionnaires.

Looking forward to supporting you by ensuring that Questionnaires are distributed and collected back.

Yours sincerely

DEPARTMENT OF HEALTH
ANN LATSKY NURSING COLLEGE
Principal
2016 -06- 09
PRIVATE BAG 40
AUCKLAND PARK 2006

MRS. R.M. RAMAHLAFI
PRINCIPAL

Annexure C2: Permission by provincial nursing college no. 2

P.O. Box 3696
Southgate
2082
24 May 2016

The Principal
Chris Hani Baragwanath Nursing College
Private Bag X 05
Bertsham
2013

Dear Mrs Ntsele

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH

I hereby request permission to conduct research at Chris Hani Baragwanath Nursing College on **"Research capacity of nurse educators at provincial nursing colleges in Gauteng, South Africa".**

I am a student at North West University, studying Masters in Nursing Education. I am required to conduct research and submit a dissertation as a requirement for my study. The aim of this study is to identify and describe the research capacity and research capacity needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

The questionnaires will be distributed to all nurse educators who are willing to participate in the study. Based on the findings of this study the recommendations will be made on strategies to enhance or maintain the research capacity in nursing colleges. The final report will be made available after the study.

Please find the attached ethical clearances, questionnaire and information leaflet. I would like to commence the data collection phase in June 2016 in order to meet deadlines for the current academic year. Thus I would appreciate it if I could get the response as soon as possible so that I could be able to submit to the HREC for full approval.

Yours sincerely

F.M. Dhladhla
Telephone: 012 420 1006
Mobile: [redacted]
Email: fikiledh@gmail.com

GAUTENG PROVINCE

CHRIS HANI BARAGWANATH NURSING COLLEGE
RAHIMA MOOSA CAMPUS

Private Bag X 116 Tel: (011) 2473000
Melville Fax: (011) 2473350
2109

To: Ms. Dladhla Fikile
From: Mrs. T Makgopela
Research committee chairperson

2016/07/08

Re: Request to collect data

Dear Madam

The research committee has reviewed the research proposal. It was found that all the relevant criteria have been met.

The research committee recommended that permission to collect data at the college be granted. The contact people to assist you are as follows:

- Chris Hani Baragwanath Nursing College: [redacted]
- Rahima Moosa Campus: [redacted]
- Bonalesedi campus: [redacted]

Kind regards

Signed: _____ 2016/07/08
Research committee chairperson — Date

Confirmed by: _____ 13/07/2016
Principal — Date

Annexure C3: Permission by provincial nursing college no. 3

P.O. Box 3696
Southgate
2082
24 May 2016

The Principal
Garankuwa Nursing College
Private Bag X 30
Pretoria
0001

Dear Mr Seabelo

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH

I hereby request permission to conduct research at Garankuwa Nursing College on **"Research capacity of nurse educators at provincial nursing colleges in Gauteng, South Africa".**

I am a student at North West University, studying Masters in Nursing Education. I am required to conduct research and submit a dissertation as a requirement for my study. The aim of this study is to identify and describe the research capacity and research capacity needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

The questionnaires will be distributed to all nurse educators who are willing to participate in the study. Based on the findings of this study the recommendations will be made on strategies to enhance or maintain the research capacity in nursing colleges. The final report will be made available after the study.

Please find the attached ethical clearances, questionnaire and information leaflet. I would like to commence the data collection phase in June 2016 in order to meet deadlines for the current academic year. Thus I would appreciate it if I could get the response as soon as possible so that I could be able to submit to the HREC for full approval.

Yours sincerely

F.M. Dhladhla
Telephone: 012 420 1006
Mobile: [redacted]
Email: fikiledh@gmail.com

GA-RANKUWA NURSING COLLEGE

Ga-Rankuwa Nursing College
Private Bag x 830
PRETORIA
0001
23 June 2016

Enquiries: Dambuza ML (Ms)
Tel No: 012 560 0450 ext 2026
E-mail: Dambuza.Loraine@gauteng.gov.za

Dhladhla FM (Ms)
P.O Box 3696
Southgate
2023

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH

Madam

Receipt of the application letter for permission to conduct research at the college is herewith acknowledged and bears reference.

You are herewith informed that since your research study has been approved by Department of Health Gauteng Province, Ga-Rankuwa Nursing College does not have objection in your intentions to collect data from its nurse educators.

Kindly contact Motaung DR (Mrs) Vice Chairperson of Research and Publication committee at the following:
Telephone number: 012560 0450
Email address: drcmotaung25@gmail.com and Dambuza.Loraine@gauteng.gov.za.

Good luck in your endeavours.

Regards,

SEABELO SW (MR)
PRINCIPAL

23/06/2016
DATE

Annexure C4: Permission by provincial nursing college no. 4

P.O. Box 3696
Southgate
2082
23 May 2016

The Principal
S.G. Lourens Nursing College
Private Bag X755
Pretoria
2001

Dear Ms Tjale

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH

I hereby request permission to conduct research at S.G. Lourens Nursing College on **"Research capacity of nurse educators at provincial nursing colleges in Gauteng, South Africa".**
I am a student at North West University, studying Masters in Nursing Education. I am required to conduct research and submit a dissertation as a requirement for my study. The aim of this study is to identify and describe the research capacity and research capacity needs of nurse educators at Gauteng provincial nursing colleges in South Africa.

The questionnaires will be distributed to all nurse educators who are willing to participate in the study. Based on the findings of this study the recommendations will be made on strategies to enhance or maintain the research capacity in nursing colleges. The final report will be made available after the study.

Please find the attached ethical clearances, questionnaire and information leaflet. I would like to commence the data collection phase in June 2016 in order to meet deadlines for the current academic year. Thus I would appreciate it if I could get the response as soon as possible so that I could be able to submit to the HREC for full approval.

Yours sincerely

F.M. Dhladhla
Telephone: 012 420 1006
Mobile: [redacted]
Email: fikiledh@gmail.com

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Enquiries : Ms. N.B Mothokoa
Tel : 012 319 5717
Fax : 012 319 5742
E-mail norma.mothokoa@gmail.com
Reference Number: 8/1/7/5/2

Ms. FM Dhladhla
P.O. Box 3696
Southgate
Johannesburg

SUBJEC : APPROVAL FOR DATA COLLECTION

This serves as a response to your request in undertaking the study on: Research capacity of nurse educators at provincial nursing colleges in Gauteng, South Africa.

Permission is hereby granted for collection of data as indicated in your proposal.
Please take note of the following:

- All information and data collected should be treated as confidential and ethical considerations adhered to as stated in the proposal.
- At the end of the study kindly furnish the college with the study results.
- The Committee might invite you to present during their annual research day.

Thank you

NB Mothokoa (Research Committee Chairperson) — Date: 07.06.2016

Ms MP Tjale (College Principal) — Date: 09/06/2016

Annexures D: Permission for Questionnare

Gmail by Google

Fikile Dhladhla <fikiledh@gmail.com>

Questionnare

Ingeborg Elisabeth Severinsson <Elisabeth.Severinsson@hbv.no> Mon, Oct 20, 2014 at 1:16 PM
To: Fikile Dhladhla <fikiledh@gmail.com>

Dear Fikile,

Thank you for email. I have attached the articles in this email. You will find all the items i the Tables & Figures.

My questionnaire is in Norwegian thus it will not help you and you do not need it really -you have all the items included in the papers.

Good Luck to you. Let me know if you want to compare the Norwegian nurses and you nurses in Africa. We can set up a study if you like

Kind regards
Elisabeth

Elisabeth Severinsson,
Professor/Director of Research at the Centre for Women's, Family & Child Health, Faculty of Health Sciences, Buskerud & Vestfold University College, P.O Box 235, N-3603 Kongsberg, Norway, Phone:+47 97501822
Email: elisabeth.severinsson@hbv.no
Adjunct Professor Stavanger University Hospital, Research Department, P.O Box 8100, N-4068 Stavanger, Norway.
http://www.hbv.no/forskning/sentra/kvinne-,-familie--og-barns-helse/

Annexures E: Questionnaire

Research Capacity and Research Capacity Needs Survey

Project title: Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa.

INTRODUCTION

The aim of this survey is to identify and describe the research capacity and research capacity developmental needs of nurse educators at Gauteng provincial nursing colleges in South Africa. The survey will take about 45 to 60 minute to complete and it consist of three (3) sections i.e. section A, section B and section C.

INSTRUCTIONS

Outlay of Questionnaire

Section A: Demographic Profile

This section focus on demographic profile. The information will be used to describe the nurse educators who gave us this information. The information will be kept confidentially. The section consist of nine (9) multiple choice and closed ended questions.

Section B: Interest in Research and Research needs

This section focus on research interest and research needs. The information will be used to identify and describe individual research interest and research needs. The section consists of 14 multiple choices, closed ended and open ended questions.

Section C: Research skill level

This section focus on research skill level. The information will be used to identify and describe the individual research skill level. Please rate yourself on the research skill and not the mere theoretical understanding of the specific research concept. The section consists of 63 multiple choice questions.

Important Notes

Please read the instructions and questions carefully before answering

Please mark the appropriate answer with an **X** (see example below)

Identifying researchable areas	1	2	3	X	5	6

Where indicated please give brief descriptions

SECTION A: DEMOGRAPHIC PROFILE

This section of the questionnaire refers to the background or biographic information. The researcher is aware of the sensitivity of the question in this section; the information will be used to describe the nurse educators who gave us this information. Individual demographic data will never be released.

1	Age	..... years	
2	Gender	Male	1
		Female	2
3	Marital Status	Single	1
		Married	2
4	Position held	PND 1	1
		PND 2	2
		PND 3	3
		Other (specify)	4
5	Highest qualification?	Post basic diploma in nursing education	1
		Bachelor degree	2
		Masters degree	3
		Doctorate	4
		Other (specify)	5
6	What course/s are you teaching?	Enrolled nursing	1
		Basic diploma: Bridging course or four year diploma	2
		Post basic course	3
		Other (specify	4
7	How long have you worked as a nurse educator?	.....years ..... months	
8	How long have you worked in your present position?	.....years ..... months	
9	How long have you worked in your present organization?	.....years ..... months	

PLEASE TURN THE PAGE

SECTION B: INTEREST IN RESEARCH AND RESEARCH NEEDS The following questions are about your interests in research and your research needs			
1	Percentage of time used for research	≤=10%	1
		11- 20%	2
		21 – 30%	3
		31 – 40%	4
		≥41%	5
2	Are you currently studying towards a masters /higher degree	Yes	1
		No	2
3	If yes explain type and stage		
4	Are you engaged in research?	Yes	1
		No	2
5	If yes give an explanation		

Question 6 – 9 is about your current overall research skills and research interest. Use the Likert scale provided to rate your level of research skill and research interest.

Rating scale: 1=poor, 2= reasonable, 3=good, 4=very good,5=excellent and 6=unsure							
6	Current research skill level	1	2	3	4	5	6
7	Level of independent research skill as a researcher	1	2	3	4	5	6
8	Desire to increase your research skills	1	2	3	4	5	6
9	Interested to engage in research	1	2	3	4	5	6

Question 10 – 14 are open ended questions. Please provide a brief description for each question.

10	What are your perceived motivational factors for professional development? ....

11	What are your perceived research barriers? ....
12	What are your research priorities for the next 2 years? ....
13	How can the institution assist the nurse educators to enhance research skills? ....
14	Which areas of research skill do you want to improve? ....

SECTION C: RESEARCH SKILL LEVEL

The following questions are about your current research skills level. Please encircle or mark in the relevant column to indicate the best description of your research skill. *There are no right or wrong answers. We are interested in your opinions*

Rating scale: 1=poor, 2= reasonable, 3=good, 4=very good,5=excellent and 6=unsure

What is your current research skill in relation to the following aspects of the research process?

Exploratory phase							
1.	Identifying researchable areas	1	2	3	4	5	6
2.	Assessing the importance of the research area	1	2	3	4	5	6
3.	Formulating research question	1	2	3	4	5	6

4.	Identifying possible ethical issues the research	1	2	3	4	5	6
5.	Identifying resources that will be required in doing research	1	2	3	4	5	6
6.	Identifying available resources	1	2	3	4	5	6
7.	Locating funding	1	2	3	4	5	6
Literature Review							
8.	Accessing relevant literature	1	2	3	4	5	6
9.	Keeping a systemic record of the literature accessed	1	2	3	4	5	6
10.	Developing a cogent critical synthesis of the literature	1	2	3	4	5	6
Design Phase							
11.	Determining an appropriate research design	1	2	3	4	5	6
12.	Specifying hypothesis/ research questions	1	2	3	4	5	6
13.	Specifying independent/ dependent variables	1	2	3	4	5	6
14.	Identifying confounding variables	1	2	3	4	5	6
15.	Controlling confound variables	1	2	3	4	5	6
16.	Determining sample size	1	2	3	4	5	6
17.	Determining sample sampling procedure	1	2	3	4	5	6
18.	Considering internal validity of an instrument	1	2	3	4	5	6
19.	Considering external validity of an instrument	1	2	3	4	5	6
20.	Determining data collection methods	1	2	3	4	5	6
21.	Determining data analysis methods	1	2	3	4	5	6
22.	Choosing procedure for data collection	1	2	3	4	5	6
23.	Choosing of a research setting	1	2	3	4	5	6
24.	Developing instrumentation	1	2	3	4	5	6
25.	Piloting the study	1	2	3	4	5	6

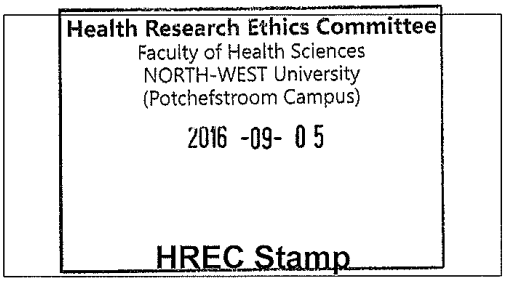
26.	Balancing precision against feasibility and logistics	1	2	3	4	5	6
27.	Developing an interview guide	1	2	3	4	5	6
Preparation for action phase							
28.	Scheduling activities	1	2	3	4	5	6
29.	Preparing detailed research proposal	1	2	3	4	5	6
30.	Seeking the approval of relevant authorities	1	2	3	4	5	6
31.	Seeking consent from participants	1	2	3	4	5	6
32.	Informing parties of schedule	1	2	3	4	5	6
33.	Estimating costs for research	1	2	3	4	5	6
34.	Accessing possible sources of funding	1	2	3	4	5	6
35.	Training assistants in data collection method	1	2	3	4	5	6
36.	Assess inter-rater reliability	1	2	3	4	5	6
Action phase							
37.	Conducting interviews	1	2	3	4	5	6
38.	Taking field notes	1	2	3	4	5	6
39.	Conducting small group interviews	1	2	3	4	5	6
Data analysis phase							
40.	Describing sample population	1	2	3	4	5	6
41.	Meeting sampling criteria	1	2	3	4	5	6
42.	Applying appropriate statistical techniques	1	2	3	4	5	6
43.	Discourse analysis from written text	1	2	3	4	5	6
44.	Analysing interview data	1	2	3	4	5	6
45.	Editing transcripts	1	2	3	4	5	6
46.	Using computerized statistical package(s)	1	2	3	4	5	6

47.	Interpreting findings	1	2	3	4	5	6
Writing-up phase							
48.	Demonstrating proficiency in written expression	1	2	3	4	5	6
49.	Using textual citation according to an accepted referring system	1	2	3	4	5	6
50.	Presenting findings clearly and comprehensively	1	2	3	4	5	6
51.	Reporting on the findings in relation hypotheses/objectives	1	2	3	4	5	6
52.	Comparing research findings with earlier studies	1	2	3	4	5	6
53.	Determining implications	1	2	3	4	5	6
54.	Identifying limitations	1	2	3	4	5	6
55.	Identifying themes in the qualitative data	1	2	3	4	5	6
56.	Making abstractions based on data	1	2	3	4	5	6
57.	Making suggestions for further research	1	2	3	4	5	6
58.	Compiling a reference list conforming to accepted practice	1	2	3	4	5	6
59.	Deciding how to publish material	1	2	3	4	5	6
60.	Targeting an audience for the research report	1	2	3	4	5	6
61.	Tailoring final report according to audience	1	2	3	4	5	6
62.	Submitting report for consideration/publication	1	2	3	4	5	6
63.	Circulating paper to enhance profile as a researcher	1	2	3	4	5	6

Thank you for participating in the Research Capacity and Research Capacity Needs Survey

Annexures F: Informed consent form to participants

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS



CONSENT FORM FOR NURSE EDUCATORS AT GAUTENG PROVINCIAL NURSING COLLEGES IN SOUTH AFRICA

TITLE OF THE RESEARCH PROJECT: Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa

REFERENCE NUMBERS: NWU-00374-15-A1

PRINCIPAL INVESTIGATOR: Mr FG Watson

ADDRESS: North-West University, Faculty of Health Sciences, INSINQ

CONTACT NUMBER: 018-299 1874

You are being invited to take part in a research project that forms part of my research study on research capacity and research capacity needs of nurse educators at Gauteng provincial nursing colleges. Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00374-15-A1)** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki and the ethical guidelines of the National Health Research Ethics Council. It might be necessary for the research ethics committee members or relevant authorities to inspect the research records.

What is this research study all about?

- *This study will be conducted at Gauteng provincial nursing colleges and will involve filling in a questionnaire with three sections which will be administered*

experienced health researchers trained in data collection. Three hundred and forty (n=340) participants will be included in this study.

- *The objectives of this research are: to identify and describe the current research capacity and current research capacity developmental needs of the nurse educators at Gauteng provincial Nursing Colleges.*

Why have you been invited to participate?

- *You have been invited to participate because you have complied with the following inclusion criteria: A nurse educator (male or female) currently employed in a provincial nursing college as you will be able to provide relevant valuable information, willing to participate in the research through signing informed consent as an act to demonstrate voluntary participation, you didn't participate in a pilot study as that will mean you had already made your contribution in this research study and you are available for data collection as there will be a time frame to collect data.*
- *You will be excluded if: you are not employed in one of Gauteng provincial nursing colleges as the focus is on nurse educators at public nursing colleges, you had participated in pilot study and had already made your contribution in this study and you were not available for data collection as there will be a time frame to collect data.*

What will your responsibilities be?

- *You will be expected to fill in questionnaire with three sections: section A- biographic data, section B- your research interest and current developmental needs and section D- research skill level. This might take between 45 minutes to one hour. I will try my best to arrange it at a convenient time.*

Will you benefit from taking part in this research?

- *The indirect benefits for you as a participant will be the opportunity to share your experience of research as a nurse educator. The broader benefit will be to Gauteng nursing colleges in mapping the research capacity of nurse educators, in order to enhance or maintain acceptable level of nurse educators' research capacity.*
- *The findings may be used by nursing colleges in other provinces to enhance research capacity of nurse educators and thus improving quality of nursing education.*

Are there risks involved in your taking part in this research?

- *The risks in this study are minimal due to the topic being more of an intellectual nature. Possible power relationship exists with me as the researcher it might create a feeling of unease thus the mediators will be involved during filling and collection of questionnaires; the data collection might interfere with your planned schedule thus the researcher will adhere to the planned or agreed time schedules and altered comfort related to unfavorable environment thus conducive environment will be provided for data collection.*
- *The benefits in this study outweighs the risk*

What will happen in the unlikely event of some harm/form of discomfort occurring as a direct result of your taking part in this research study?

- *Should you have the needs during the data collection an opportunity will be arranged for you to ventilate you concerns to the mediator who will try by all means to assist you.*

Who will have access to the data?

- *Anonymity will be guaranteed as there will be no names written in the questionnaire, participants and colleges will be coded and the questionnaires will be put in a sealed box that will be opened by the researcher, Confidentiality will be ensured, only the researcher, supervisor and statistician will have access to data. Data will be kept safe and secure by locking hard copies in locked cupboards in the researcher's office and for electronic data it will be password protected.*
- *Reporting of findings will be anonymous by coding the colleges to prevent identity of participants. Only the researchers and North-West University team members who are involved in the study will have access to the data. Data will be kept safe and secure by locking hard copies in locked cupboards in the researcher's office and for electronic data it will be password protected. Data will be stored for five years.*

What will happen with the data/samples?
This is a once off collection of data and the data will be analysed by the statistician at North West University for the purpose of this study.

Will you be paid to take part in this study and are there any costs involved?

No, you will not be paid to take part in the study but refreshments will be provided on the day of data collection. There will thus be no costs involved for you, if you do take part.

Is there anything else that you should know or do?

- You can contact Mrs. Fikile Dhladhla [redacted] if you have any further queries or encounter any problems.
- You can contact the Health Research Ethics Committee via Mrs Carolien van Zyl at 018 299 1206; carolien.vanzyl@nwu.ac.za if you have any concerns or complaints that have not been adequately addressed by the researcher.
- You will receive a copy of this information and consent form for your own records.

How will you know about the findings?
The findings of the research will be shared with you by presentations at the different colleges. For the Provincial Department of Health and relevant institutions dissemination will be done in a form of a report and these findings would also be communicated to the broader research community and research users as presentations in conferences and publications in accredited health journals.

Declaration by participant

By signing below, I ..... agree to take part in a research study entitled: Research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa

I declare that:

- I have read this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ..... on (*date*) ..... 20....

....

Signature of participant **Signature of witness**

Declaration by person obtaining consent

I *(name)* ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter.

Signed at (*place*) ..... on (*date*) ..... 20....

....

Signature of person obtaining consent **Signature of witness**

Declaration by investigator

I *(name)* ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter.

Signed at (*place*) ..... on (*date*) ..... 20....

.....	.....
Signature of investigator	**Signature of witness**

Annexure G: Language editing

CERTIFICATION

This serves to confirm that I, Vivien van der Sandt, took care of the language editing of the mini dissertation:

The research capacity and research capacity needs of nurse educators at provincial nursing colleges in Gauteng, South Africa

By F.M. Dhladhla

VIVIEN VAN DER SANDT

MEMBER OF THE PROFESSIONAL EDITORS' GUILD

VIVIEN SANDT FREELANCE SERVICES

viviensandtFS@gmail.com

CELL: 061 246 9069

31 May 2019

Annexure H1: Confidentiality agreements (independent person)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Prof / Dr / Mr / Ms Sharon Charmaine Hartman

Identity Number: [redacted]

Address: [redacted]

hereby undertake in favor of the **NORTH-WEST UNIVERSITY**, a public higher education institution established in terms of the Higher Education Act No. 101 of 1997

Address: Office of the Institutional Registrar, Building C1, 53 Borcherd Street, Potchefstroom, 2520

(hereinafter the "NWU")

1 Interpretation and definitions

1.1 In this undertaking, unless inconsistent with, or otherwise indicated by the context:

1.1.1 "Confidential Information" shall include all information that is confidential in its nature or marked as confidential and shall include any existing and new information obtained by me after the Commencement Date, including but not be limited in its interpretation to, research data, information concerning research participants, all secret knowledge, technical information and specifications, manufacturing techniques, designs, diagrams, instruction manuals, blueprints, electronic artwork, samples, devices, demonstrations, formulae, know-how, intellectual property, information concerning materials, marketing and business information generally, financial information that may include remuneration detail, pay slips, information relating to human capital and employment contract, employment conditions, ledgers, income and expenditures and other materials of whatever description in which the NWU has an interest in being kept confidential; and

1.1.2 "Commencement Date" means the date of signature of this undertaking by myself.

1.2 The headings of clauses are intended for convenience only and shall not affect the interpretation of this undertaking.

1

7 Jurisdiction

This undertaking shall be governed by South African law be subject to the jurisdiction of South African courts in respect of any dispute flowing from this undertaking.

8 Whole agreement

8.1 This document constitutes the whole of this undertaking to the exclusion of all else.

8.2 No amendment, alteration, addition, variation or consensual cancellation of this undertaking will be valid unless in writing and signed by me and the NWU.

Dated at 29th this September 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

Annexure H2: Confidentiality agreements (college mediators)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Prof / Dr / Mr / Ms NB Mothokoa.

Identity Number: [redacted]

Address: [redacted]

hereby undertake in favor of the **NORTH-WEST UNIVERSITY**, a public higher education institution established in terms of the Higher Education Act No. 101 of 1997

Address: Office of the Institutional Registrar, Building C1, 53 Borcherd Street, Potchefstroom, 2520

(hereinafter the "NWU")

1 Interpretation and definitions

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1

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8 Whole agreement

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Dated at S.G Lavens this 8 November 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

~~Prof / Dr / Mr~~ / Ms Tryphina Selesojo

Identity Number: [redacted]

Address: [redacted]

hereby undertake in favor of the **NORTH-WEST UNIVERSITY**, a public higher education institution established in terms of the Higher Education Act No. 101 of 1997

Address: Office of the Institutional Registrar, Building C1, 53 Borcherd Street, Potchefstroom, 2520

(hereinafter the "NWU")

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Dated at Ann Latsky NCape this 02/ Nov. 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Prof / Dr / Mr / Ms Mrs Ruth Sampie Sinelave

Identity Number: [redacted]

Address: [redacted]

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Dated at Rongelesedi this 27th October 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Prof / Dr / Mr / Ms MRS. MAKGOPELA TEBOGO

Identity Number: [redacted]

Address: [redacted]

hereby undertake in favor of the **NORTH-WEST UNIVERSITY**, a public higher education institution established in terms of the Higher Education Act No. 101 of 1997

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Dated at 29 this SEPTEMBER 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Prof / Dr / Mr / Ms MD Padini

Identity Number: [redacted]

Address: [redacted]

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Dated at Soweto this 11th October 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Prof / Dr / Mr / (Ms) MERIAM SEMANKI TSATSANE

Identity Number: [redacted]

Address: [redacted]

hereby undertake in favor of the **NORTH-WEST UNIVERSITY**, a public higher education institution established in terms of the Higher Education Act No. 101 of 1997

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Dated at GA-RANKUWA this 14 OCTOBER 2016

Witnesses:

1 .....

2 .....

(*Signatures of witnesses*)

.....

(*Signature*)

Schematic representations of results on the open ended responses of the nurse educators

1. Section B: Question 3, If yes explain type and stage.

Table 1.1: Final results after deliberation for type and stage of current studies

Category	Sub-category	N	%
Type of higher degree	Masters	25	62.5
	PhD	14	35
	No response	1	2.5

Category	Sub-category	N	%
Stage of higher degree	Process of applying	1	2.6
	Have not started	2	5.1
	Proposal	20	51.3
	Awaiting approval	1	2.6
	Literature review	2	5.1
	Research methodology	7	17.9
	Data analysis	3	7.7
	Results and findings	2	5.1
	Conclusions, recommendations and limitations	1	2.6

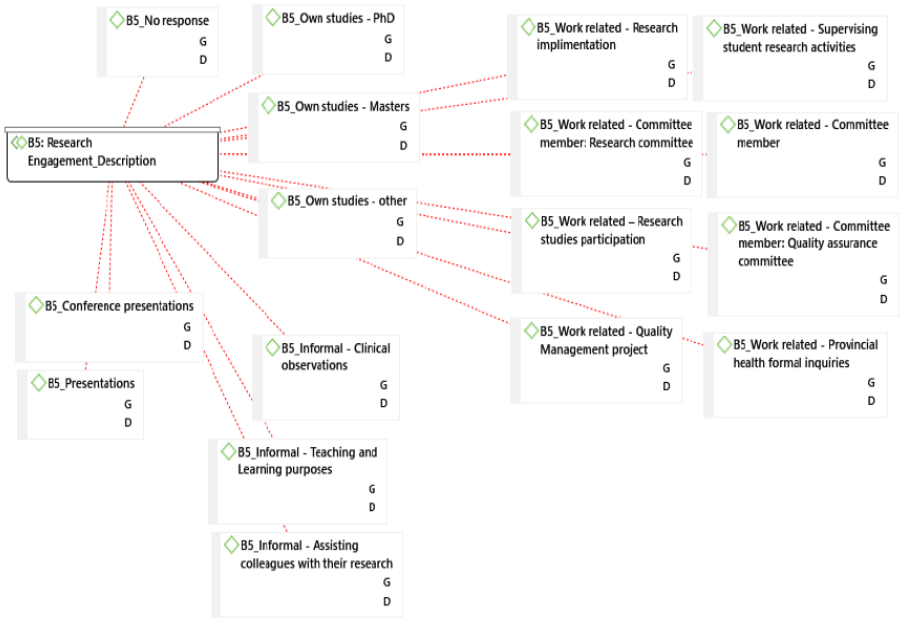
Annexure I: Schematic results on the open ended responses of the nurse educators

2. Section B: Question 5, If yes give an explanation.

2.1. Initial excel output for description of research engagement.

Code	Grounded
B5_Conference presentations	1
B5_Implimentation	1
B5_Informal – Assisting colleagues with their research	4
B5_Informal – Clinical observations	1
B5_Informal – Teaching and Learning purposes	10
B5_No response	77
B5_Own studies	2
B5_Own studies - Masters	14
B5_Own studies – PhD	15
B5_Presentations	1
B5_Studying	1
B5_Work related – Committee member	2
B5_Work related – Committee member: Quality assurance committee	1
B5_Work related – Committee member: Research committee	12
B5_Work related – Mentoring/Coaching/Supervising : Student research activities	9
B5_Work related – Provincial health formal inquiries	1
B5_Work related - Quality Management project	2
B5_Work related – Research studies participation	1

2.2. Schematic representation: Atlas.ti network output of research engagement.



2

Table 2.1: Final results after deliberation for description of research engagement.

Description of research engagement		
Category	**Sub-category**	**Sub-sub-category**
Own studies (32)	PhD (15)	
	Masters (14)	
	Other (3)	
Work related (29)	Committee member (15)	Research committee (12)
		Quality assurance committee (1)
		Only indicated committee (2)
	Supervising student research activities (9)	
	Quality management projects (2)	
	Research implementation (1)	
	Research participant (1)	
	Provincial health formal inquiries (1)	
Informal activities (15)	Teaching and learning purposes (10)	
	Assisting colleagues with their research (4)	
	Clinical observations (1)	
Presentations (2)	Presentation only stated (1)	
	Conference presentation (1)	

* Frequencies (times mentioned) are indicated in brackets after the categories and sub-categories.

3. Section B: Question 10, What are your perceived motivational factors for professional development?

3.1. Initial excel output for description of perceived motivational factors for professional development.

Code	Grounded
B10_achievement_futher qualifications	11
B10_achievement_work performance	3
B10_advancement_career	13
B10_advancement_competencies	3
B10_advancement_knowledge	18
B10_contributing_mentor_young researchers	2
B10_contributing_nursing profession	19
B10_contributing_nursing research	2
B10_contributing_society	3
B10_Lack of interest in nursing education research in country	2
B10_Lack of support_for engaging in research	5
B10_need for collaboration_academics higher level	1
B10_need for collaboration_other academics	1
B10_Negative attitudes_leadership	1
B10_No response	27
B10_none	2
B10_participant response unclear	5
B10_personal growth	16
B10_personal motivation	3
B10_recognition_financial	6
B10_recognition_professional	4
B10_Renewed clinical competence	34
B10_seeing other educators doing research	2
B10_skills development_communication skills	1
B10_skills development_internet use	1
B10_skills development_knowledgeable about scientific databasis	3
B10_skills development_renewed clinical competence	5
B10_support needs_financial support	1
B10_support needs_organisational support	2
B10_support needs_study leave	4
B10_Workload concerns_clinical environment	3
B10_Workload concerns_education environment	5
B10_Workload concerns_Lack of time to complete studies	4

3.2. Schematic representation: Atlas.ti network output of perceived motivational factors for professional development.

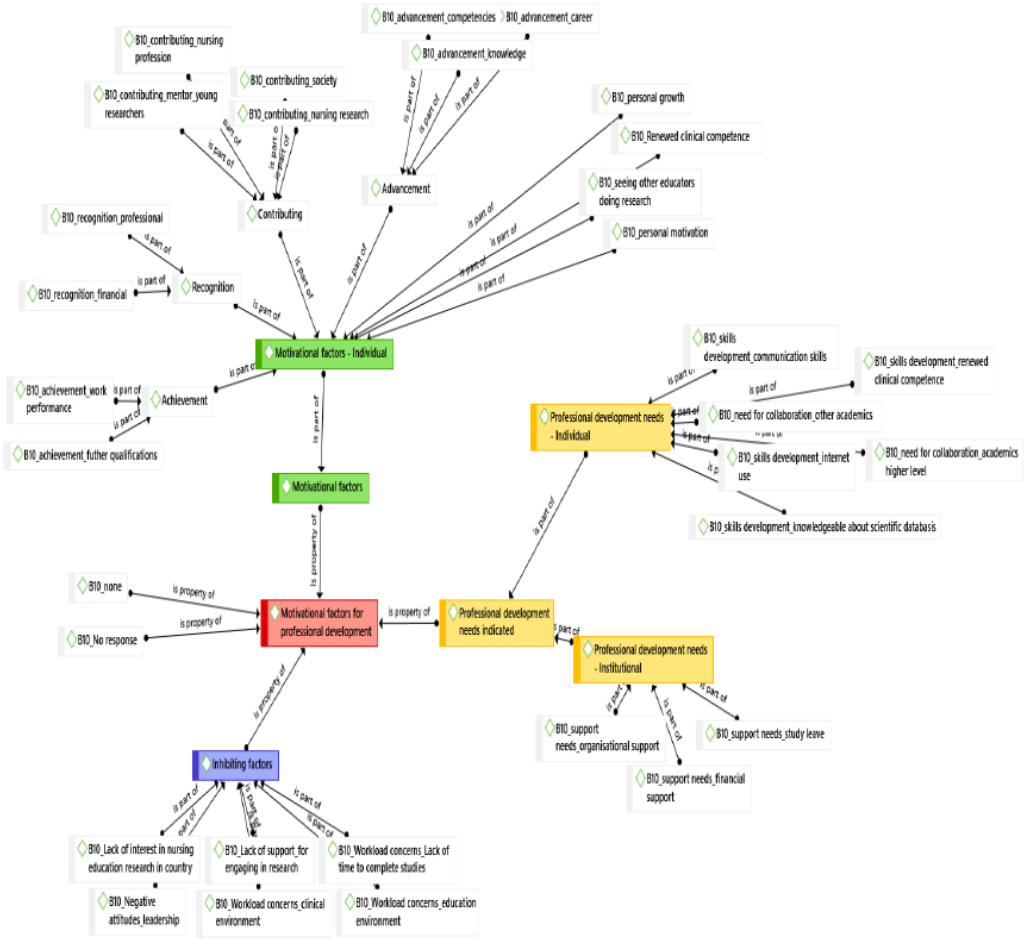


Table 3.1: Final results after deliberation for perceived motivational factors for professional development.

Description of research perceived motivational factors for professional development (163)		
Category	**Sub-category**	**Sub-sub-category**
Individual motivational factors (139)	Achievement (14)	Further qualification (11)
		Work performance (3)
	Advancement (34)	Knowledge (18)
		Competencies (3)
		Career (13)
	Contribution (26)	Nursing profession (19)
		Society (3)
		Nursing research (2)
		Mentoring young students (2)
	Recognition (10)	Financial (6)
		Professional (4)
	Renewed clinical competence (34)	
	Personal growth (16)	
	Personal motivation (3)	
	Role models (2)	Seeing other educators doing research (2)
Inhibiting factors(20)	Lack of support (5)	Research engagement (5)
	Workload concerns (12)	Educational environment (5)
		Lack of time to complete studies (4)
		Clinical environment (3)
	Lack of interest (2)	General lack of interest in nursing education research in South Africa (2)
	Leadership (1)	Negative attitudes (1)
Indicated none (2)		
No response (27)		
Participant response unclear (5)		

* Frequencies (times mentioned) are indicated in brackets after the categories and sub-categories.

Interestingly the participants not only indicated their perceived motivational factors for professional development but also responded with their current professional development needs. These professional development needs are listed below.

Table 3.2: Final results after deliberation for perceived motivational factors for professional development needs under motivational factors.

Professional development needs indicated under motivational factors(19)		
Categories	**Sub-categories**	**Sub-sub-categories**
Individual development needs (12)	Skills development (10)	Renewed clinical competence (5)
		Knowledgeable about scientific databases (3)
		Internet use (1)
		Communication skills (1)
	Collaboration (2)	Other academics (2)
Institutional development needs (7)	Support needs (7)	Study leave (4)
		Organisational support (2)
		Financial support (1)

* Frequencies (times mentioned) are indicated in brackets after the categories and sub-categories.

4. Section B: Question 11, What are your perceived research barriers?

4.1. Initial excel output for description of perceived research barriers.

Code	Grounded
B11_age	3
B11_approval from authorities takes long	2
B11_being a part time student	3
B11_ethical issues	1
B11_gatekeepers in HEI	1
B11_high workload	18
B11_high workload_many academic challenges	6
B11_high workload_number of students	2
B11_high workload_preperation lectruring activities	2
B11_high workload_shortage of staff	1
B11_institutional permission	4
B11_lack of leave_50/50 study leave not enough	1
B11_lack of leave_no sabbatical leave	2
B11_lack of resources_general	4
B11_lack of support_experts	2
B11_lack of support_management	6
B11_lack of_experience	10
B11_lack of_funding	41
B11_lack of_knowledge	10
B11_lack of_leave	5
B11_lack of_mentorship	3
B11_lack of_motivation	4
B11_lack of_organisational research infrastructure	2
B11_lack of_research activities_low implimentation oppertunities	1
B11_lack of_research activities_more research days	1
B11_lack of_resources_articles and books	6
B11_lack of_resources_internet	1
B11_lack of_resources_IT support	3
B11_lack of_support groups	2
B11_lack of_support_employer	5
B11_lack of_support_general	4
B11_lack of_support_insufficient IT access	1
B11_lack of_time	57
B11_language	1
B11_management_bad attitude toward nurse researchers	2
B11_No response	6
B11_no salary increase after obtaining degree	1
B11_None	6
B11_none_new to institution	1
B11_not involved in research	1
B11_not sure yet	2
B11_Opportnuities to serve in the research committee are limited	1
B11_participants_participant recruitment	1
B11_participants_willingness of participants	7
B11_personal reasons	4
B11_regulations hindering further studies	2
B11_responsibilities at home	4

4.2. Schematic representation: Atlas.ti network output of perceived research barriers.

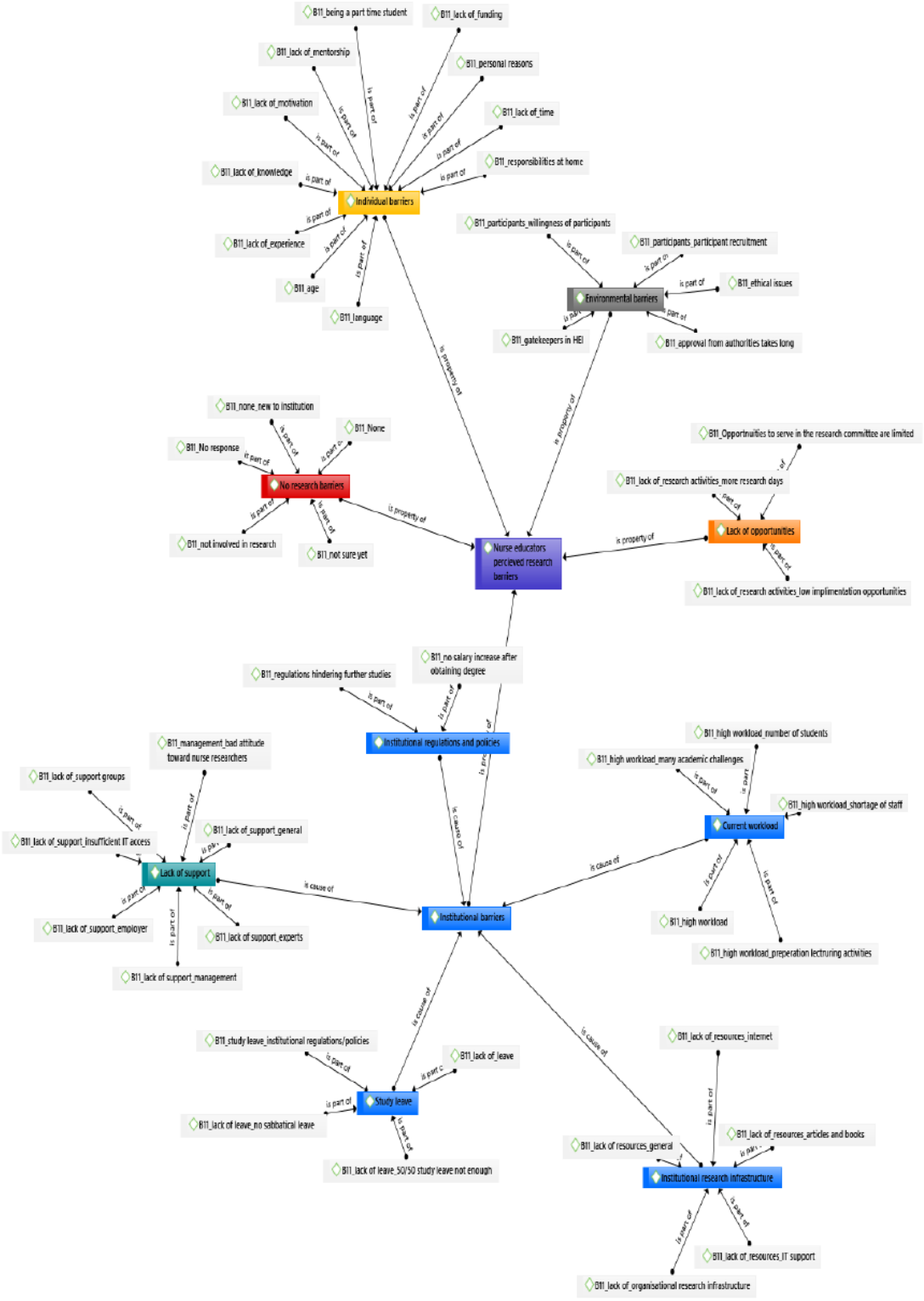


Table 4.1: Final results after deliberation for perceived research barriers.

Nurse educators perceived research barriers (239)		
Categories	**Sub-categories**	**Sub-sub-categories**
Environmental barriers(6)	Approval from authorities takes long (2)	
	Ethical issues (1)	
	Gatekeepers in HEI (1)	
	Participant recruitment (1)	
	Willingness of participants (1)	
Institutional barriers (81)	Current workload (29)	High workload (18)
		Many academic challenges (6)
		Number of students (2)
		Preparation lecturing activities (2)
		Shortage of staff (1)
	Study leave(11)	Lack of study leave (5)
		50/50 study leave not enough (1)
		No sabbatical leave (1)
		Institutional policies and regulations (4)
	Lack of institutional support(21)	Lack of support from experts (2)
		Lack of support from management (8)
		Lack of institutional support groups (2)
		Lack of support from employer (5)
		Lack of general support (4)
	Institutional regulations and policies(3)	No salary increase after obtaining degree (1)
		Institutional regulations hindering further studies (2)
	Institutional research infrastructure (17)	Lack of institutional research infrastructure (2)
		Lack of resources - articles and books (6)
		Lack of resources – internet (1)
		Lack of resources - IT access and support (4)
		Lack of resources – general (4)
Individual barriers (140)	Age (3)	

	Being a part time student (3)	
	Lack of experience (10)	
	**Lack of funding (41)	
	Lack of knowledge (10)	
	Lack of mentorship (3)	
	Lack of motivation/interest (4)	
	**Lack of time (57)	
	Language (1)	
	Personal reasons (4)	
	Responsibilities at home (4)	
Lack of opportunities (3)	Lack of research activities - low implementation opportunities (1)	
	Lack of research activities - more research days (1)	
	Opportunities to serve in the research committee are limited (1)	
Indicated none (7)	None (6)	
	Indicated not involved in research (1)	
Not sure (2)		
No response (6)		

* Frequencies (times mentioned) are indicated in brackets after the categories and sub-categories.

** Note that though lack of funding and time was categorised under individual barriers, they also have to be viewed in relation to institutional barriers.

5. Section B: Question 12, What are your perceived research priorities for the next two 2 years?

5.1. Initial excel output for description of perceived research priorities for the next two 2 years.

Code	Grounded
B12_education_complete Masters	14
B12_education_complete own studies	10
B12_education_complete PhD	8
B12_education_enroll for Masters	11
B12_education_enroll for own studies	5
B12_education_enroll for PhD	11
B12_mentoring_assist other researchers	1
B12_mentoring_encourage other to further their studies	2
B12_more involvement_quality improvement	5
B12_more involvement_research activities	7
B12_more involvement_research committee	2
B12_more involvement_research projects	4
B12_networking	1
B12_No priorities	16
B12_No response	22
B12_not research related	5
B12_participant response unclear	1
B12_publish article/s	11
B12_topic_attitude of staff and skills development	1
B12_topic_Chronic diseases management	1
B12_topic_curriculum of students should be evidence based need for more research	1
B12_topic_Effect of nursing and professional practice is a serious concern among nurses. I would prioritze it for research and speed up the work towards implementing recommendation.	1
B12_topic_effective methods to improve patient care, psychiatric pts	1
B12_topic_high failure rate of students at my college	1
B12_topic_high rate of hypertension in pregnant teenagers	1
B12_topic_is the present curriculum of nursing administration prepared nurses as business managers?	1
B12_topic_Job satisfaction in Nursing Colleges, the impact of lecturer drop-out on student performance	1
B12_topic_lack of mentorship in education	1
B12_topic_Material & child health, HIV/AIDS - adolescent	1
B12_topic_Mother and child/midwives practice - service dellivery and staffing	1
B12_topic_My priority is to research why students absent themselves from class	1

B12_topic_Pregnant women and mental health, student view of midwives , how can midwives improve the student experience	1
B12_topic_reduce practice-theory gap	1
B12_topic_reduce student failure rate	1
B12_topic_Research in health science	1
B12_topic_shortage of nurses in SA	1
B12_topic_substance abuse by adolescents and capacity for parents and families to support adolescents	1
B12_topic_Using researsch knowledge to identify problems for student terminating their course in second level	1
B12_topicExploring the feeling of 1st level students who failed the year	1
B12_uncertain	2

5.2. Schematic representation: Atlas.ti network output of perceived research priorities for the next two 2 years.

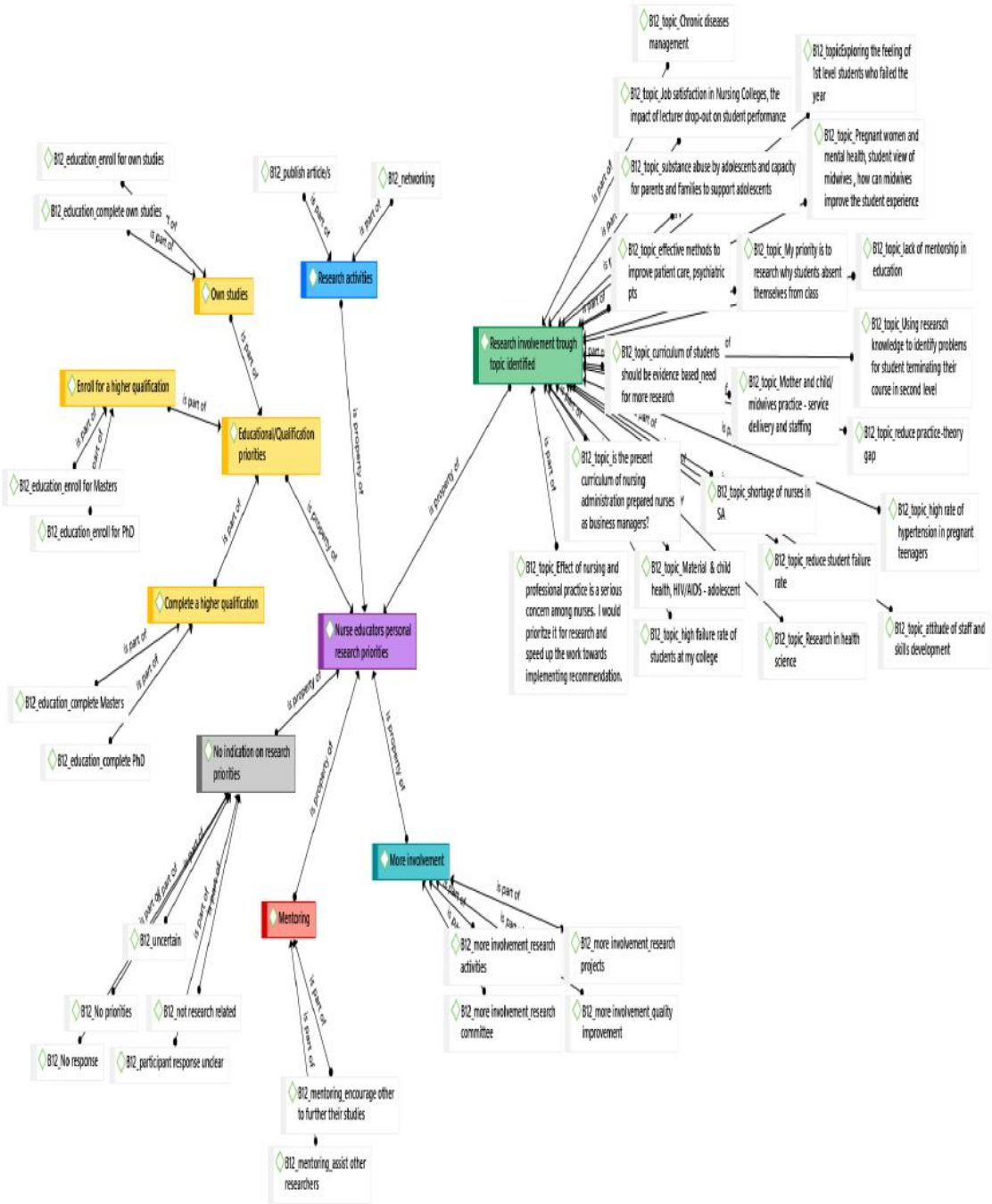


Table 5.1: Final results after deliberation for perceived research priorities for the next two 2 years.

Description of research priorities (135)		
Category	**Sub-category**	**Sub-sub-category**
Own studies (59)	Complete studies (32)	Complete PhD(8)
		Complete Masters(14)
		Others (10)
	Enrol for studies (27)	Enrol for PhD(11)
		Enrol for Masters(11)
		Others (5)
More involvement in research (18)	Research activities (7)	
	Quality improvement research (5)	
	Research project (4)	
	Institutional research committees (2)	
Research activities (12)	Publish article/s (11)	
	Networking (1)	
Research mentoring (3)	Encourage other to further their studies (2)	
	Assist other researchers (1)	
Research project 25	Identified topic of interest (25)	
No priorities (16)		
Uncertain (2)		
Participant response unclear (1)		
No response (22)		

* Frequencies (times mentioned) are indicated in brackets after the categories and sub-categories.

Interestingly 25 participants even though not indicating their research priority did indicate their interest in doing a research project by identifying a research topic that they are interested in. Though this does not reflect the participant's research priorities it does however suggest the participants' keenness in getting involved in research.

6. Section B: Question 13, How can the institution assist the nurse educators to enhance research skills?

6.1. Initial excel output for description of perceived research capacity enhancement through institutional assistance

Code	Grounded
B13_advocating_equal opportunities for part time and full time students	1
B13_advocating_importance of conducting research	2
B13_advocating_research problems from practice	2
B13_continuous research models/approach	1
B13_encouraging_all level educators to do and present research	13
B13_encouraging_publication	1
B13_encouraging_research feedback/dissimination from peers	1
B13_encouraging_teaching strategies that support researcher	1
B13_establishing networks_other HEI's	1
B13_establishing of_research committee in the workplace	4
B13_establishing_support groups an/or journal club	6
B13_free higher education	1
B13_improving_IT resources	2
B13_involve research at all levels of teaching students	1
B13_No response	4
B13_none	1
B13_providing_IT resources	5
B13_providing_libraries with updated textbooks and journals	1
B13_providing_opportunities for conducting small scale research in the institution and to publish the results	3
B13_providing_research resources	4
B13_providing_research training	5
B13_support for_attending conferences	5
B13_support for_attending inservice training	10
B13_support for_attending seminars	2
B13_support for_attending workshops	15
B13_support for_continues professional development	1
B13_support for_study leave	37
B13_support for_studying	6
B13_support through_funding	27
B13_support through_mentorship	5
B13_support trough_increasing salary after qualification	3
B13_support trough_institutional involvement	3
B13_support trough_institutional permission to study	1
B13_support trough_involving educators in research committee	2
B13_support trough_more time for research involvement	35
B13_support trough_ongoing research days for interest development	1
B13_support trough_policies and guidelines for research	1
B13_support trough_reducing workload	1
B13_support trough_strenghten insitutional committee	4
B13_support_general	5

6.2. Schematic representation: Atlas.ti network output of perceived Research capacity enhancement through institutional assistance.

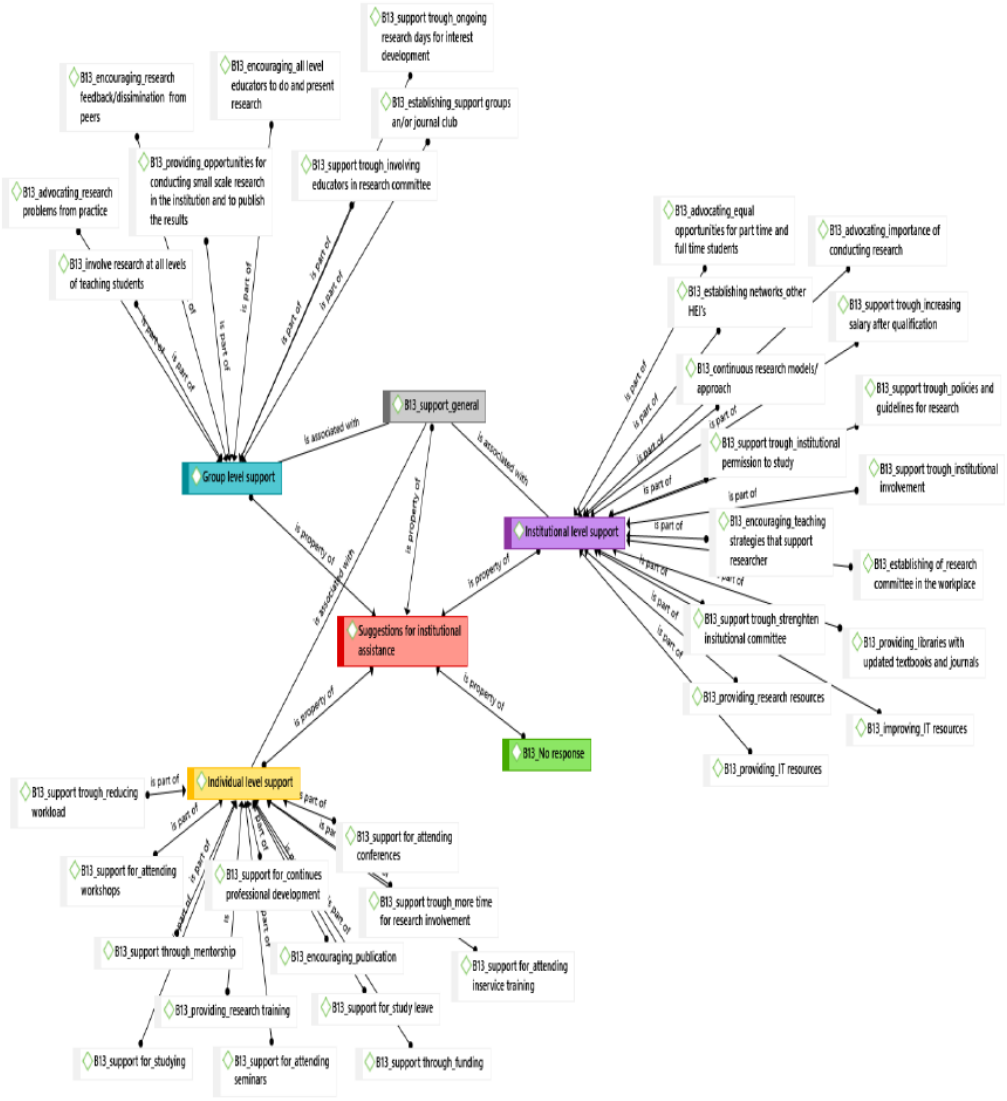


Table 6.1: Final results after deliberation for perceived Research capacity enhancement through institutional assistance.

Suggestions for institutional assistance (219)	
Categories	**Sub-categories**
Individual level support assistance (150)	Study leave (37)
	More time for research involvement (35)
	Funding (27)
	Attending workshops (15)
	Attending conferences(5)
	Attending in-service training(10)
	Attending seminars(2)
	Continuous professional development(1)
	Providing research training (5)
	Support for studying (6)
	Mentorship(5)
	Reducing workload (1)
	Encouraging publication (1)
Group level support assistance (32)	Research feedback/dissemination from peers (1)
	All level educators to do and present research (13)
	Teaching strategies that support researcher (1)
	Advocating on importance of conducting research(3)
	Support on-going research days for interest development(1)
	Establishing support groups an/or journal club(6)
	Providing opportunities for conducting small scale research in the institution(3)
	Applying research at all levels of teaching students (1)
	Free higher education (1)
	Identifying research problems from practice (2)
Institutional level support assistance(31)	Support through institutional permission to study(1)
	Support through strengthen institutional committee (4)
	Support through involving educators in research committee(2)
	Support through increasing salary after qualification (3)
	Support through institutional involvement (2)
	Support through policies and guidelines for research (1)
	Establishing networks other HEI's(1)
	Establishing of research committee in the workplace (4)
	Research resources (4)

	IT resources (5)
	Libraries with updated textbooks and journals (1)
	Equal opportunities for part time and full time students (1)
	Improving IT resources (2)
General support (5)	
None (1)	
No response (4)	

* Frequencies (times mentioned) are indicated in brackets after the categories and sub-categories.

7. Section B: Question 14, Which areas of research skill do you want to improve?

7.1. Initial excel output for description of perceived areas of research skill improvement as identified by nurse educators.

Code	Grounded
B14_All areas of the research process	14
B14_Basic research theoretical knowledge	12
B14_choosing a research topic	5
B14_clinical setting	7
B14_colleges	1
B14_conceptual framework	1
B14_data analysis	19
B14_data analysis_qualitative research	1
B14_data analysis_quantitative	1
B14_data collection	14
B14_data collection_quantitative	1
B14_Formulation of a research question	7
B14_How to identifying a research problem	3
B14_I think I fully understand research	1
B14_identifying available resources	2
B14_in text citation	1
B14_instrument development	7
B14_interpreting statistics	1
B14_literature review	9
B14_literature search	7
B14_literature study	1
B14_locating funding	1
B14_mixed methods research	2
B14_No response	9
B14_none	7
B14_none_close to retirement	3
B14_nursing education	1
B14_problem statement	2
B14_public health	1
B14_qualitative research	3
B14_quantitative research	8
B14_reading for research purposes	1
B14_reference management	3
B14_referencing	2
B14_research design	6
B14_research proposal	8
B14_rigour	1
B14_sampling	1
B14_scientific writing	4
B14_statistical analysis	3
B14_statistics	4
B14_systematic review	1
B14_theoretical framework	1
B14_time management	1
B14_unsure	5
B14_writing an article for publications	9
B14_writing-up	4

7.2. Schematic representation: Atlas.ti network output of perceived areas of research skill improvement as identified by nurse educators.

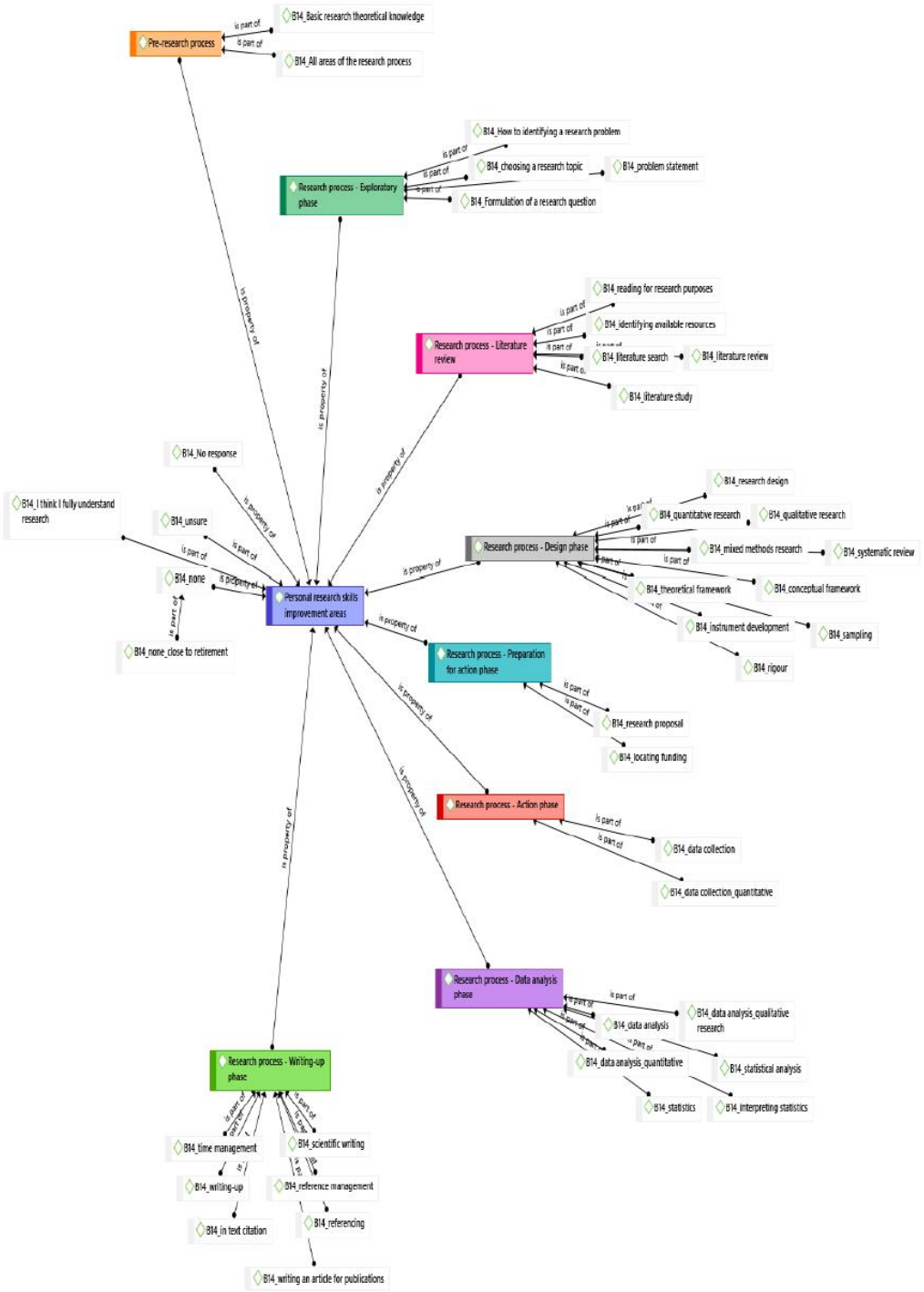


Table 7.1: Final results after deliberation for perceived areas of research skill improvement as identified by nurse educators.

Personal research skills improvement areas(187)	
Categories	**Sub-categories**
Pre-research process (26)	Basic research theoretical knowledge (12)
	All areas of the research process (14)
Research process	
Exploratory phase (17)	Choosing a research topic (5)
	How to identifying a research problem (3)
	Formulating a problem statement (2)
	Formulation of a research question (7)
Literature review (20)	Reading for research purposes (1)
	Identifying available resources (2)
	Literature search (7)
	Literature review (9)
	Literature study (1)
Design phase (31)	Research design (6)
	Quantitative research (8)
	Qualitative research (3)
	Mixed methods research (2)
	Systematic review (1)
	Theoretical framework (1)
	Conceptual framework (1)
	Instrument development (7)
	Sampling (1)
	Rigour (1)
Preparation for action phase (9)	Research proposal (8)
	Locating funding (1)
Action phase (15)	Data collection (14)
	Data collection quantitative research (1)
Data analysis phase (29)	Data analysis (19)
	Data analysis quantitative research (1)
	Data analysis qualitative research (1)
	Statistical analysis (3)
	Interpreting statistics (1)
	Statistics (4)

Writing-up phase(24)	Scientific writing (4)
	Writing up (4)
	Reference management (3)
	Referencing (2)
	In text citation (1)
	Writing an article for publication (9)
	Time management (1)
None (11)	None (7)
	None due to close to retirement (3)
	I think I fully understand research (1)
Unsure (5)	
No response (9)	

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