Evidence to inform the development of physiotherapy guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

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ABSTRACT

Background: Methods to improve women's health have become an urgent global priority. Development of clinical guidelines is viewed as a way of improving the quality of health care in South Africa. At present there are no physiotherapy guidelines for women post-caesarean section delivery (CSD) and post-hysterectomy, which are the most common procedures performed by obstetricians and gynaecologists. South African women have the highest HIV-prevalence rates in the world, but there is a global dearth of literature on common postoperative complications for this cohort of women. The aim of this study was to provide evidence supporting the development of physiotherapy clinical guidelines relevant for HIV-infected and HIV non-infected women following caesarean section delivery and hysterectomy.

Method: The overall design of the study was prospective, descriptive and explanatory, with longitudinal, comparative and cross-sectional components incorporated at the different phases of the study. An amalgamated four-phase conceptual framework with specific objectives per phase was used to achieve the study aim. Phases 1 and 2 were conducted at four public hospitals in KwaZulu-Natal. Phase 1 identified the long-term complications and quality of life for HIV-infected and non-infected women post-CSD (N=310) and hysterectomy (N=101) over a six- month period; phase 2, which was cross-sectional in nature, identified treatment strategies and complications described by physiotherapists (N=31) for this cohort of women. Purposive probability sampling and purposive convenient sampling was used to select potential participants for phases 1 and 2. A self-administrated questionnaire with close and open-ended questions was used in the first two phases of the study. During phase 3, a systematic review and Delphi method (N=12) were used to investigate current management strategies of representative physiotherapists. Purposive sampling was used to select the participants who are considered as experts in the field of women's health, for the Delphi study. The information from phases 1 to 3 was collated in phase 4 to provide the evidence to inform the development of the clinical guidelines.

Results: Phase 1 revealed that physical health complications commonly persisted for at least six months and negatively affected the quality of life of women post-CSD or post-hysterectomy. Phase 2 showed that very few patients post-CSD and hysterectomy were being

referred for physiotherapy, and of those referred, the main problem being treated was respiratory complications. A systematic review of the literature yielded only one article relevant to the outcome of management of patients post- hysterectomy, thus illustrating the dearth of literature in this area. The experts who were consulted for the Delphi study suggested treatment techniques for the postoperative complications identified in phase 1, and consensus was reached on the techniques in the second Delphi round. The results were then collated in the final phase and presented in tables containing the identified problem, treatment and best available evidence to move towards the development of the guidelines.

Discussion: The common postoperative morbidities that were identified in this study can be prevented or treated with physiotherapy, but information is needed in this area to guide treatment practices. The prevention of postoperative complications can result in a decrease in demand for services, thereby reducing the current strain on the health system. The current study contributed to 18 of the 23 criteria in the appraisal of guidelines for research and an evaluation tool. The conceptual framework used to generate the evidence can also be employed in other facets of health care.

Conclusion: In order to improve the quality of health care rendered to women, health care professionals require a complete picture of their patient. This research adds to the body of knowledge in an area where there is a dearth of literature and provides a platform to develop clinical guidelines. No national research exists that compares the postoperative complications of HIV-infected and non-infected women, which is essential to enable comprehensive care of HIV-infected women. The guidelines that will be developed can improve the quality of health care rendered to women, and establish the role of physiotherapists in this area.

KEYWORDS

Caesarean section delivery

HIV

Hysterectomy

Physiotherapy

Quality of life

Women

DECLARATION

I declare that: Evidence to inform the development of Physiotherapy Guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery is my own work and it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Name: _____ Date: _____

Signed: _____

DEDICATION

For Avi.

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RESEARCH OUTPUT

This research project has resulted in the following research output:

1. Chapter 6: Reddy P., Frantz J. (2013). Physiotherapy management strategies for women post-caesarean section delivery in public hospitals in KwaZulu-Natal, South Africa. South African Journal of Physiotherapy, 69(1), 4 – 9

2. Chapter 4: Poster presentation at the International Congress of Women's Health Issues, 10-12 November 2014
Theme: Maternal Morbidity and Mortality
Title: Long term complications of HIV-infected and HIV non-infected women following cesarean section delivery in KwaZulu-Natal South Africa

3. Chapter 6: Accpeted for poster presentation at the World Congress of Physiotherapy Singapore May 2015
Title: Physiotherapy management strategies for women post cesarean section delivery and hysterectomy in Public Hospitals in KwaZulu-Natal, South Africa.

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LIST OF ABBREVIATIONS

Acquired immunodeficiency syndrome	AIDS
Caesarean section delivery	CSD
Health related quality of life	HRQoL
Human immunodeficiency virus	HIV
KwaZulu-Natal	KZN
Lower back pain	LBP
Multidisciplinary Team	MDT
Pelvic floor muscles	PFM
Quality of life	QoL
South Africa	SA
Transcutaneous electrical nerve stimuaiton	TENS
United Nations	UN
Urinary incontinence	UI
World health organization	WHO

CHAPTER 1. INTRODUCTION

1.1 INTRODUCTION

Understanding, curing and eradicating medical conditions that plague humans is the driving force behind most medical research. This requires understanding human anatomy and more specifically, the physiological and anatomical differences between males and females. This is necessary to ensure a just society, where the health and well-being of both sexes are equally important, but while there are health issues and conditions that equally affect men and women, some health issues such as HIV have a greater impact on women owing to their biology (World Health Organization [WHO], 2010). These conditions may have a negative impact on a woman's health, well-being and quality of life (QoL) (WHO, 2010), as well as an impact on their children and consequently on society and the economy of the country. Focusing on the health of women and girls is therefore an investment in present and future generations (WHO, 2009), and highlights the need for health programmes that are tailored specifically to cater for women throughout their lifespan (WHO, 2009). Every health care provider and physiotherapist has a role to play in improving the quality of health care services offered to women. One of the known methods of improving the quality of health care services is through guideline development (National Health and Medical Research Council of Australia, 1998). However, in order to develop clinical guidelines, research in the field of women's health is required.

This chapter presents the background to the study, the problem statement, the research question, and the aim and objectives of the research. Terms that are used in the study are defined, and the chapter concludes with an overview of the remaining chapters.

1.2 BACKGROUND TO THE STUDY

In 1948, the World Health Organization defined health as a "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." The implications of this are that the QoL during recovery or a remission period from any medical ailment has equal weight to curing the condition. In spite of this sentiment, gender

inequalities have often translated into poor access to health care for women and children, particularly in developing countries (WHO, 2009), where the average life expectancy of women in 2011 was 58 years in African countries (WHO, 2013). While women might have a longer life expectancy than men, it is not necessarily a healthier one (WHO, 2009).

In many countries, political and societal norms have resulted in women being disempowered and vulnerable (Hassim, Heywood & Berger, 2007; Sen, Östlin & George, 2007), these injustices translating into women and girls having an inferior education, being paid less in the workplace, and having a smaller political voice than their male counterparts (WHO, 2009; Hassim et al., 2007; Annandale & Hunt, 2000). Violence against women and cultural expectations has compounded the problem (WHO, 2009; Hassim et al., 2007). Consequently, gender inequality has had a negative effect on the health status of females and has reduced their access to health care (Hassim et al., 2007; Sen et al., 2007; WHO, n.d). At the present time there is a growing global movement to rectify this.

Rectifying gender inequalities in health is viewed as a key aspect in promoting equitable health for all individuals (WHO, 2010), this being acknowledged by three of the eight United Nations (UN) Millennium Development Goals (MDG) (United Nations [UN], 2013). These are: MDG 3, to promote gender equality and empower women; MDG 5, improving maternal health; and MDG 6, combating HIV, malaria and other diseases (UN, 2013). As reported by Hassim et al. (2007), "a core component in South Africa's aspiration towards gender equality is ensuring that women are able to access safe, adequate and gender-sensitive health care services". While this country might not have met the MDGs as set by the UN, it has made some progress compared to other African countries (Statistics South Africa, 2013b; UN, 2013).

Globally, women have better longevity mainly due to behavioural and biological advantages (WHO, 2009). Phillips (1995) stated that "women's health involves women's emotional, social, cultural, spiritual and physical well-being, and it is determined by the social, political and economic context of women's lives as well as by biology." Furthermore, the author highlighted the need for women to be allowed the opportunity to sustain, achieve and maintain their health, based on their own specific health needs, in order to reach their full potential (Phillips, 1995). Health conditions unique to women, or that affect them in specific

ways such as autoimmune diseases (Quintero et al., 2012), depression (Hassim et al., 2007) or menopause, are well known, the majority being largely dependent on their life stage.

The female reproductive tract, which is of particular importance in this study, consists of highly specialised organs, namely two ovaries and fallopian tubes, the uterus and vagina (Haslam, 2004). Biological changes to one or more of these structures (e.g. during pregnancy) is common, but when abnormalities occur and specialised treatment is required (WHO, 2009) such as a caesarean section or hysterectomy (both of which primarily affect the uterus), the QoL of women can be negatively affected (WHO, 2010). The health care needs of women will not be met if they have identical investments in health care services with men (Sen et al., 2007; WHO, 2010). This necessitates aiding women by improving the quality of health care offered to them by identifying their needs and tailoring specific health care services and treatments that are a result of their biological role as reproducers, which will improve their QoL. This can be achieved through generating evidence for clinical guideline development, which is the aim of this study. Furthermore, in South Africa, the health problems of women are compounded by high human immunodeficiency virus (HIV) prevalence rates among women (The Joint United Nations Programme on HIV and AIDS [UNAIDS], 2013a) the impact of which also needs to be considered.

1.3 THE PREVALENCE OF HUMAN IMMUNODEFICIENCY VIRUS AMONG WOMEN

In 2002, Kofi Annan, the head of the United Nations, stated that “In Africa, AIDS has a woman's face”, in acknowledgement of the need to mobilise efforts to "save Africa’s women". Women are disadvantaged by being socially and biologically more susceptible to contracting HIV (WHO, 2009), the global HIV prevalence rate among women in low to middle-income countries being estimated at 52%. In sub-Saharan Africa, the HIV prevalence rate among women was estimated at 57% (UNAIDS, 2013a). South Africa’s epidemic remains the highest globally, with an estimated 5.26 million people living with HIV, which is approximately 10% of the population (Statistics South Africa, 2013a). The UNAIDS (2013a) global report was slightly higher, with an estimated 6.1 million (5.8 million – 6.4 million) people living with AIDS in South Africa, with approximately 17% of women in their reproductive age being HIV positive (Statistics South Africa, 2013a). Within South Africa, KwaZulu-Natal remains the epicenter of the disease, with the HIV prevalence rate estimated

at 37.4% of the total population (South African [SA] Department of Health, 2011b). The optimistic outlook for this scenario is that the HIV incidence rates are stabilising in South Africa, with the 2011 antenatal statistics revealing a slight decrease (0.7%) in the new infection rate from the previous year (SA Department of Health, 2011b). In the absence of a cure, improving the life span of infected people remains the focus of the health care system.

South Africa currently has the largest global roll out of highly active antiretroviral treatment (HAART), which has led to an increase in the longevity of the people infected with the virus (Shisana et al., 2009; UNAIDS, 2013a). The other middle- to low-income countries affected by the epidemic are also providing antiretroviral treatment through their public health sector, and for the first time since the start of the HIV epidemic, 10% of their adults infected with the virus are over the age of 50 years (UNAIDS, 2013b). The 2012 South African household survey by Shisana et al. (2014) found the HIV prevalence to be 12% among women and 6.9% among men aged 55 –59 years and 13% between both sexes aged 50 –54 years.

The general perception of the HIV infection has thus changed from a deadly disease to a chronic condition, and while the use of HAART reduces morbidity and mortality, HIV-infected women now face new health challenges. The increased life span in seropositive women makes them more susceptible to developing AIDS-related cancers and other gynaecological conditions (Smith, 2010; Cejtin, 2008). Physiotherapy management for this growing cohort of patients therefore needs to be established, as mismanagement could impact negatively on the patients' QoL following surgery. The researcher found no literature detailing the postoperative complications of HIV-infected women post obstetric (caesarean section) and gynaecological (hysterectomy) surgery specific to physiotherapy. Furthermore, in terms of HIV non-infected women post obstetric and gynaecological surgery, literature specific to physiotherapy is also scarce, with no South African studies being found. The researcher can only conclude that those patients are treated based on patient presentation, clinical reasoning and general postoperative principles. While this is not incorrect, specific complications that physiotherapists can address and prevent following obstetric and gynaecological surgery, need to be established to improve the quality of postoperative care, and to prevent complications from becoming chronic.

1.4 POSTOPERATIVE COMPLICATIONS IN OBSTETRIC AND GYNAECOLOGICAL SURGERY

The most common procedures performed by obstetricians and gynaecologists are caesarean section deliveries (CSD) (Bamigboye & Hofmeyr, 2005) and hysterectomies (Davies, Hart, Magos, Hadad & Morris, 2002) respectively. With respect to caesarean section, a reason for this rise is that obstetricians are increasingly agreeing to requests for non-medically indicated caesarean sections (Penna & Arulkumaran, 2003). The other plausible reason is that elective caesarean sections are now the most preferred delivery route for babies of HIV-infected pregnant women (Panburana, Phaupradit, Tantisirin, Sriintravanit & Buamuenvai, 2003), depending on their viral load (Read & Newell, 2005). This is due to the procedure reducing the HIV-vertical transmission rate from mother to child (The European Mode of Delivery Collaboration, 1999). While this mode of delivery is not feasible in under-resourced countries, the caesarean section rate in the South Africa public sector is above the recommended WHO norm of 10 – 15 % (WHO, 1985). Medical reasons for CSD procedures include breech presentation, fetal distress, failure to progress in labour and repeat caesarean section (Bonney & Myers, 2010).

The most common postoperative complications post-CSD are obstetric haemorrhage, infection and venous thromboembolism (Bonney & Myers, 2010), with obstetric haemorrhage being one of the leading causes of maternal death in South Africa (Moodley & Pattinson, 2012). While most research has focused on the short-term complications post-CSD (Silver, 2010), several potential long-term complications and risks post-CSD are pelvic pain, adhesions, symptoms associated with caesarean scar dehiscence, decreased fertility, placenta previa, a morbidly adherent placenta and spontaneous uterine rupture (Silver, 2010; Penna & Arulkumaran, 2003). The literature also states that a CSD is not associated with a major reduction in long-term anal and urinary incontinence (Altman, Ekström, Forsgren, Nordenstam & Zetterström, 2007; Groutz et al., 2004).

In terms of a hysterectomy, the reasons for performing this surgical procedure may vary between uterine cancer, cervical cancer and various common noncancerous uterine conditions such as multiple-fibroids, endometriosis and prolapse (Forsgren & Altman, 2013). There are several techniques to perform the procedure, namely the vaginal route, laparotomy (abdominal) and laparoscopy (Forsgren & Altman, 2013), with the selection of technique

being dependent on the medical condition and the skill of the surgeon. The presence of postoperative complications may vary depending on the risk factor profile of the patient prior to surgery (e.g. obesity and smoking), as well as the surgical route of the hysterectomy (Clarke-Pearson & Geller, 2013), with women undergoing an abdominal hysterectomy being at the highest risk for complications (Clarke-Pearson & Geller, 2013; Davies et al., 2002).

A study by Davies et al. (2002) showed a complication in 1:3 to 1:5 women undergoing a hysterectomy for benign indications. Common categories of postoperative complications post hysterectomy include infection, venous thromboembolisms, genitourinary and gastrointestinal tract injury, bleeding, nerve injury and vaginal cuff dehiscence (Clarke-Pearson & Geller, 2013). In patients undergoing a radical hysterectomy, 5–15% of patients complain about bladder dysfunction and lymphocyte formation (Ware & van Nagell, 2010). The long-term effects of a hysterectomy are not well investigated, but a recent review by Forsgren and Altman (2013) showed that urinary incontinence, pelvic organ prolapse, bowel dysfunction, sexual function and pelvic organ fistula formation are potential adverse long-term outcomes.

Obstetricians and gynaecologists usually request physiotherapy for their patients either pre- or postoperatively, depending on their diagnosis and clinical presentation. Literature has suggested that the postoperative complications of HIV-infected and HIV non-infected females undergoing obstetric and gynecological surgery are similar (Horberg et al., 2006), except in cases where the female has a high viral load prior to surgery. It is essential for the physiotherapist to understand the postoperative complications, and to establish their role in preventing or minimising the associated complications. The long-term complications that physiotherapy can address following obstetric and gynaecological surgery are not well documented in either national or international literature, and may differ depending on the HIV status of the patient. Thus the need arises to determine the long-term complications and how physiotherapists can assist in preventing and/or minimising them.

1.5 THE HISTORY AND ROLE OF PHYSIOTHERAPY IN WOMEN'S HEALTH

Physiotherapists have been involved in women's health since the early 20th century (Mantle, Haslam & Barton, 2004), this being prior to the profession being formally recognised in the 1920s (American Physical Therapy Association, 2011; Mantle et al., 2004). Initially, this role

dealt only with obstetric work, with Miss Minnie Randell, a nursing sister and midwife based at Thomas Hospital in London, becoming interested, and training in Swedish Massage and remedial exercises. She was thereafter approached by a consultant obstetrician to develop exercises for women following delivery, which led to the development of antenatal and postnatal exercises (Mantle et al., 2004). It was only in the late 1970s, thanks to British physiotherapist Helen Heardman, that this field expanded to include gynaecological problems and the treatment of incontinence (Boissonnault, 2005; Mantle et al., 2004). In the 1980s, this 'new' area became known as 'women's health', as a means of providing more holistic care. Physiotherapists continue to play an essential role as part of the multidisciplinary team managing patients who have undergone obstetric and gynaecological surgery (Cook, 2004).

In South Africa, physiotherapists have been involved in women's health since the 1970s. It was only in 1996 that the South African association changed its name to the Association for Women's Health (AWH) in order to include other areas of women's health (Boissonnault, 2005). In 2001, the AWH had 120 members (Boissonnault, 2005), and changed its name in 2008 to the Women's Health Physiotherapy Group (WHPG) (Women's Health Physiotherapy Group, n.d.) The group currently has 190 members (Women's Health Physiotherapy Group, personal communication, June 24, 2012), which is relatively small considering that 6 329 physiotherapists registered with the Health Professionals Council of South Africa (Health Professionals Council of South Africa, personal communication, July 24, 2013).

The value of physiotherapists involved in this niche area is often underestimated, despite their essential role in preventing and treating a wide range of preoperative and/or postoperative obstetric and gynaecological lifestyle-related problems throughout a woman's life, such as urinary incontinence, pelvic organ prolapse and lower back pain (Mantle et al., 2004). Women's Health forms a small part of the physiotherapy undergraduate curriculum in South Africa. Therefore, patients referred for obstetric or gynaecological problems are possibly not being seen/treated by someone with a special interest in women's health. As no clinical practice guidelines are in place, unless physiotherapists are independently keeping abreast of recent information, this can potentially affect the quality of postoperative care administered to obstetric and gynaecology patients.

1.6 CLINICAL GUIDELINES IN PHYSIOTHERAPY

In 1998 the National Health and Medical Research Council of Australia (1998) stated that there was a widespread move towards developing clinical guidelines in health care. Clinical guidelines are designed to improve the quality of health care, reduce the use of unnecessary, ineffective or harmful interventions, and to facilitate the treatment of patients with maximum chance of benefit, minimum risk of harm, and at an acceptable cost (National Health and Medical Research Council, 1998). The main purpose of clinical guidelines is to make "explicit recommendations with a definite intent to influence what clinicians do" (Hayward, Wilson, Tunis, Bass & Guyatt, 1995). In terms of physiotherapy, guidelines are viewed as a way to contribute to developing the profession, to assist in reducing the differences in treatment and to enhance uniformity in the profession (van de Wees & Mead, 2004).

There are numerous guidelines available in physiotherapy, most of which are orthopaedic related and developed internationally (www.pedro.org.au). However, no physiotherapy guidelines are currently available to manage women post CSD and post hysterectomy, either internationally or locally. Furthermore, the researcher found no national clinical guidelines on the management of patients post hysterectomy, and the clinical guidelines concerning maternal care are centred on reducing maternal mortality and are medically related with no referral system presently in place for Physiotherapy (SA Department of Health, 2001, 2007a). The guidelines that were identified also utilise the biomedical approach to advance health care, with its primary aim being the reduction in maternal mortality rates (SA Department of Health, 2001, 2007a). The biomedical approach has been criticised in the past for not having sufficient impact in human terms, so it may not appreciate the effect of a condition on the QoL of an individual (Engel, 1977). This suggests that the post-procedural QoL of women undergoing a CSD or hysterectomy is being neglected. Present medical management of patients tries to be holistic in its approach, using the biopsychosocial model rather than the biomedical model. The present research will bridge the gap and identify where physiotherapists should be included regarding patient management, and what the management should entail for this group of patients, in order to improve the QoL of women.

1.7 CONCEPTUAL FRAMEWORK OF THE STUDY

The development and implementation of clinical guidelines in health services is considered important for improving and managing the care process (Grol, Wensing & Eccles, 2004). The first step to guideline development is to identify an area or problem (van de Wees & Mead, 2004), as was the case with clinical physiotherapy guidelines for women post-caesarean section and post hysterectomy. Important goals in guideline development include a higher quality of care and reduced costs, which result in improved health outcomes (Woolf, Grol, Hutchinson, Eccles & Grimshaw, 1999). Van de Wees and Mead (2004) are of the opinion that as physiotherapy guidelines become more prominent, a common framework for guideline development will:

- avoid discrepancies between guidelines;
- enhance collaboration in guideline development; and
- increase cohesion in international guideline development in physiotherapy.

The literature search revealed a dearth of material on postoperative complications specific to physiotherapists in women post-caesarean section and post hysterectomy; the researcher thus had to amalgamate the Intervention Mapping Model (Bartholomew, Parcel & Kok, 1998) with the Framework for Clinical Guidelines Development in Physiotherapy (Van de Wees, Hendriks, Custers, Burgers, Dekker & de Bie, 2007), to achieve the aim of this research.

The Intervention Mapping model was developed in the 1990s to guide the process of guideline development (Bartholomew, Parcel, Kok & Gottlieb, 2001). The model is also a tool for planning and developing health promotion interventions by mapping the path from recognition of a need or problem to identifying a solution (Bartholomew et al., 2001). It consists of six key phases that are detailed in Table 1.1. Although it is presented in a series of phases or steps, the planning process is iterative rather than linear, which allows planners to move back and forth between the phases (Bartholomew, Parcel, Kok, Gottlieb & Fernandez, 2011).

Table 1.1: Intervention mapping model phases

Phases	Definition
The needs assessment	To provide a description of the health problem and its impact on quality of life, behavioral and environmental causes and determinants of behavior and environmental causes.
Matrices of change objectives	Provides a foundation for the intervention by specifying who or what will change as a result of the intervention.
Theory-based methods and practical applications	The use of theory-based methods and practical strategies to effect changes in the health behavior of individuals and related small groups and to change organisational and societal factors to affect the environment.
Programme production	This should include a description of the scope and sequence of the components of the intervention, completed programme materials, and programme protocols.
Adoption and implementation	Detailed plan for accomplishing programme adoption and implementation by influencing the behavior of individuals who will make decisions about adopting and using the programme.
Evaluation planning	Decisions are made about change objectives, methods, strategies and change objectives. To evaluate the effect of an intervention, researchers analyse the change in health and quality of life problems, behavior and environment, and determinants of performance objectives.

The Framework for Clinical Guidelines Development in Physiotherapy described by van de Wees and Mead (2004) was developed through a collaboration of the Chartered Society for Physiotherapy (CSP) and the Royal Dutch Society for Physical Therapy (KNGF). The framework consists of six phases that are detailed in Table 1.2. Owing to the large number of clinical guidelines being developed, a foundation called the AGREE (Appraisal of Guidelines, Research and Evaluation) collaboration published an instrument to appraise the quality of clinical practice guidelines being developed (Brouwers et al., 2010). The Framework Clinical Guidelines Development in Physiotherapy was subsequently updated, and now shows a high compliance with the AGREE criteria (Van de Wees et al., 2007).

Table 1.2: Framework for Clinical Guidelines Development in Physiotherapy Phases

Phases	Description
Organisation and structure of guideline development	Centrally coordinating the development of guidelines in collabortation with other institutes. Mono-disciplinary group (5-10) or small group (2-3) of employed staff within the development group responsible for the literature review and writing up the guidelines.
Preparation	Topics of interest need to be prioritized by special interest groups. An expectation that change is possible and desirable and there is potential to improve the quality of care. Patient outcomes should exist. An initial literature search is carried out to identify any existing systematic reviews and guidelines in the area of interest.
Guideline Development	This follows several steps, namely: Refining subject area and defining research questions that should be answered. Identifying all relevant evidence through systematic identification. Assessing the methodological quality and synthesising the evidence. Translating the evidence into recommendations; Structuring the guideline is based on the clinical reasoning process of the physiotherapist.
Validation	The draft guideline should be tested for practically, clarity and acceptability and reviewed by a patient advisory board. The final draft is checked by the clinical guideline committee
Guideline Dissemination and Implementation	Four products have been identified namely: practice guideline, review of the evidence, summary (in flow chart) and a patient version. An implementation plan should also accompany the guideline.
Guideline Evaluation and Revision.	The guideline document should include a date on which it will be reviewed/updated based on new evidence, professional developments and developments in guideline methodology, with an acceptable timeframe being 5 years after publication. Weighting of the evidence and recommendations are adjusted or adapted if necessary.

In the absence of relevant literature in this area specific to physiotherapy, the researcher had to use key concepts from the Intervention Mapping Model and the Framework for Clinical Guideline Development in Physiotherapy to achieve the aim of this study. The amalgamated framework used for this study consisted of four phases and is presented in Table 1.3.

Table 1.3: The amalgamated framework developed for the study

Phases	Intervention Mapping Model	Physiotherapy Clinical Guidelines	Framework adopted for the study	Chapter in study
1	**Needs Analysis**	**Organisation and structure of guidelines development**	Identify long-term complications and quality of life.	4 and 5
2	**Matrices of change objectives**	**Preparation**	Identify current treatment strategies and complications being addressed by physiotherapists.	6
3	**Theory-Based Methods and Practical Strategies**	**Guideline Development**	Identify current physiotherapy management strategies.	7 and 8
4	**Programme production**	**Validation**	Collation of evidence for physiotherapy clinical practice guidelines development.	9
5	**Adoption and implementation**	**Dissemination and implementation**	-	Outlined in Chapter 9
6	**Evaluation**	**Evaluation and revision**	-	Outlined in Chapter 9

1.8 PROBLEM STATEMENT

Globally, there is an increase in the incidence of obstetric and gynaecological surgery for HIV-infected and HIV non-infected women. The most common obstetric and gynaecological surgeries performed are caesarean section deliveries and hysterectomies (Bamigboye & Hofmeyr, 2005; Davies et al., 2002). Physiotherapists are often requested by obstetricians and gynecologists to treat these patients postoperatively, usually as a result of complications that arise. There are currently no physiotherapy clinical guidelines specific to managing patients who have undergone a caesarean section delivery or a hysterectomy. The long-term complications as a result of surgery that physiotherapy can address and/or prevent are also not well documented in national and international literature. Furthermore, no information is available regarding differences in managing HIV-positive and negative women who have undergone these procedures. This gap in knowledge could result in the mismanagement of patients, which might negatively affect their short- and long-term QoL. There is therefore a

need to generate evidence to facilitate the development of physiotherapy clinical guidelines to manage both HIV-infected and HIV non-infected women post caesarean section delivery and hysterectomy.

1.9 AIM

The study aims to provide evidence to inform the development of physiotherapy clinical guidelines relevant for HIV-infected and non-infected women following caesarean section delivery and hysterectomy.

1.10 OBJECTIVES

The objectives will be based on the phases of the conceptual framework of this study (Table 1.4).

1. To determine the long-term complications of HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.
2. To determine the quality of life among HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.
3. To determine the physiotherapy treatment currently administered to patients post caesarean section delivery and post hysterectomy.
4. To determine the complications currently being addressed by physiotherapists in patients post caesarean section delivery and post hysterectomy.
5. To identify the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy.
6. To identify the most effective management strategies for treating women post caesarean section and hysterectomy, using the Delphi method.
7. To collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post caesarean section delivery.
8. To collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post hysterectomy.

Table 1.4: The link between the study phases and the objectives

Study Phases	Study Objectives
Phase 1: Identify long-term complications and quality of life.	1.To determine the long-term complications of HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy. 2.To determine the quality of life among HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.
Phase 2: Identify current treatment strategies and complications being addressed by physiotherapists.	3. To determine the physiotherapy treatment currently administered to patients post caesarean section delivery and post hysterectomy. 4. To determine the complication(s) currently being addressed by physiotherapists in patients post caesarean section delivery and post hysterectomy.
Phase 3: Identify current physiotherapy management strategies.	5. To identify the most effective evidence based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy. 6. To identify the most effective management strategies for treating women post caesarean section and hysterectomy using the Delphi method.
Phase 4: Collation of evidence for physiotherapy clinical practice guidelines development.	7. To collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post caesarean section delivery. 8. To collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post hysterectomy.

1.11 SIGNIFICANCE OF THE STUDY

The biological difference between women and men translates into different health risks, conditions and needs in both groups (WHO, 2010). Due to past gender inequalities, the area of women's health has been neglected, resulting in national and international efforts to improve the quality of health care services offered to women (UN, 2013; WHO, 2010; Hassim et al., 2007). There are currently no physiotherapy clinical guidelines on how to manage women following obstetric and gynaecological surgery, despite their being referred for physiotherapy postoperatively. This could negatively impact on the patient's QoL, as potential complications, excluding pulmonary complications, might be overlooked by the attending physiotherapist. In addition, specific long-term complications following surgery,

which can be prevented with the appropriate physiotherapy management in both HIV-infected and HIV non-infected patients, are not well documented in national and international literature. Owing to the improved longevity of HIV-infected individuals as a result of HAART, a higher number of HIV-infected women could be expected to undergo surgery. The correct management strategy is therefore essential, as mismanagement postoperatively can lead to treatable conditions becoming chronic, which will negatively affect the patients' QoL.

South Africa is a developing country, and an increased use of public sector health services (Cooper et al. 2004) coupled with a lack of human and financial resources, especially in the rural areas of South Africa, has resulted in inadequate service delivery (Cooper et al. 2004). Many women live in informal settlements and/or rural areas with limited access to health care facilities, which can be attributed to financial and/or social constraints. Women from disadvantaged backgrounds are also not well-educated on health conditions, and may not perceive a health problem until it is too late or requires intensive therapy.

The information generated from this study will provide insight into the possible long-term complications of patients' post-CSDs and hysterectomies. This information would be made available to physiotherapists, thereby adding to their body of knowledge and hence improving the quality of health care given to patients. In the South African context, this will assist in reducing the number of out-patient post-surgical follow-up patient visits, saving the patient time and money, and reducing the strain on the health system. While physiotherapists treat a variety of women's health-related conditions, no clinical guidelines are available to guide management for these two common operative procedures. This study may add to the body of knowledge in the physiotherapy profession, which could also contribute to strengthening the role of the physiotherapy profession among obstetricians and gynaecologists.

1.12 OPERATIONAL DEFINITIONS

AIDS: is an acronym for "acquired immunodeficiency syndrome" and is a surveillance definition based on signs, symptoms, infections, and cancers associated with the deficiency of the immune system that stems from infection with HIV (UNAIDS, 2008).

Caesarean section: is "a surgical procedure in which the abdomen and uterus are incised and a baby is delivered trans-abdominally. It is performed when abnormal maternal or fetal conditions make vaginal delivery hazardous" (Mosby's Medical Dictionary, 2009).

Clinical practice guidelines: are the "systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances" (Field & Lohr, 1990).

Gender: is the "culturally determined attitudes, perceptions or beliefs that tell people how to think, feel and act as male or female members of a particular society" (Phillips, 1995).

Health Related Quality of Life: is "a person's appraisal of her current level of functioning and satisfaction with it compared with a perceived ideal" (Cella & Tulsky, 1990).

HIV: is an acronym for "Human Immunodeficiency Virus" and is the virus that destroys the immune system and renders a person susceptible to infections (Whiteside & Sunter, 2000).

Hysterectomy: is the "surgical removal of the uterus, performed to remove fibroid tumours of the uterus or to treat chronic pelvic inflammatory disease, severe recurrent endometrial hyperplasia, uterine hemorrhage, and precancerous and cancerous conditions of the uterus. Types of hysterectomy include total hysterectomy, in which the uterus and cervix are removed, and radical hysterectomy, in which ovaries, fallopian tubes, lymph nodes, and lymph channels are removed with the uterus and cervix" (Mosby's Medical Dictionary, 2009).

Quality of Life: is defined by WHO (1997) "as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment."

1.13 OUTLINE OF SUBSEQUENT CHAPTERS

The study is presented in the following chapters:

Chapter 2: Literature Review. This chapter provides in-depth background information on the study relevant to understanding the need for the study as well as achieving its aim. It will be discussed under various sections, which are divided according to the operative procedures.

Chapter 3: Methodology. The research methodology of the study is described in this chapter, and includes the research setting, study population, sampling, the methods for data collection and the analysis. This is done with respect to the study objectives, and the rationale for the research method and study design for each phase of the study is also explained.

Chapter 4: The long-term complications and quality of life according to women following caesarean section delivery. The results identifying the long-term complications and quality of life of HIV-infected and HIV non-infected women post-CSD are presented in this chapter. Due to the magnitude of the results, this chapter focuses only on patients post CSD, while the next chapter focuses on patients post hysterectomy. The format of the chapter will be: introduction results, discussion, and conclusion.

Chapter 5: The long-term complications and quality of life according to women following a hysterectomy. The results identifying the long-term complications and quality of life of HIV-infected and HIV non-infected women post hysterectomy are presented in this chapter. The format of this chapter will be identical to Chapter 4. The information generated from Chapters 4 and 5 were used later in the study to determine if physiotherapists involved in treating this cohort of patients are currently addressing the complications identified in these chapters. The results also formed a baseline for the systematic review search (Chapter 7) to determine the most effective physiotherapy management techniques in this cohort of patients.

Chapter 6: Treatment strategies and complications addressed by physiotherapists in HIV-infected and non-infected women post-caesarean section delivery and hysterectomy. The treatment strategies and complications currently being addressed by physiotherapists treating HIV-infected and HIV non-infected women post CSD and post-

hysterectomy will be described in this chapter. These results will be compared to and combined with the results from Chapters 4 and 5 to provide search terms for the systematic review. The format of the chapter will be: introduction results, discussion, and conclusion.

Chapter 7: Current physiotherapy treatment techniques according to literature. This chapter outlines the systematic review process that was conducted to determine the current physiotherapy management strategies according to literature for complication(s) and/or potential complication(s) of women following a caesarean section and a hysterectomy. All articles meeting the inclusion criteria are presented and discussed. The information from this phase of the study was intended to be combined with the results of Phases 1 (Chapters 4 and 5) and 2 (Chapter 6) to assist in the drafting physiotherapy clinical guidelines. However, the search yielded only one article in the hysterectomy section. The researcher was therefore unable to draft the clinical guidelines based on available evidence. The information from the search will therefore be used to provide evidence to inform the clinical practice guidelines. The format of the chapter will be: introduction results, discussion, and conclusion.

Chapter 8: Physiotherapy management strategies of women post-caesarean section and hysterectomy. The results of the Delphi method that was followed to reach consensus on the appropriate management of HIV-infected and HIV non-infected women following caesarean section delivery and hysterectomy are presented and discussed in this chapter. The researcher used the two-round modified Delphi process, with the first round comprising structured questions to avoid participant fatigue (Hsu & Standford, 2007) due to the length of the questionnaires. The format of the chapter will be: introduction results, discussion, and conclusion.

Chapter 9: Collation of evidence for physiotherapy clinical guideline development. In the penultimate chapter, the information obtained from Phases 1, 2 and 3 are collated and presented. The AGREE tool is also used to highlight the quality and rigour of the information provided for guidelines development thus far. The clinical suggestions are based on the expert opinion and literature. The format of the chapter will be: introduction, evidence to inform clinical practice guidelines development for HIV-infected and non-infected women following caesarean section delivery and hysterectomy, applying the evidence to develop physiotherapy clinical guidelines and conclusion.

Chapter 10: Conclusion. The study draws conclusions in this chapter, and an overall summary of the study phases as well as the results is presented. The study limitations, implications and recommendations are also presented.

1.14 SUMMARY

This chapter presented the background to the study, the framework to be incorporated in the study, the formulation of the problem, the aims and objectives of the study. The current relevance of the research to the physiotherapy profession as well as women undergoing obstetric and gynaecological surgery was also explained and the terms used in the study were defined. The next chapter will focus on national and international literature relevant to the study.

CHAPTER 2. LITERATURE REVIEW

2.1 INTRODUCTION

This chapter explores the literature that provides a background for the aim and objectives of the study. The policies and documents governing the health care system of South Africa specifically pertaining to women's health and quality of care are reviewed. Various aspects that affect the operative procedures underpinning the study, namely caesarean section and hysterectomy, are discussed along with the physiotherapy management for the procedures. Finally, literature on evidence-based research relevant to the field of physiotherapy, and highlighting research in women's health, is presented and discussed.

The literature review was achieved by conducting regular searches on various available databases (Cochrane, EbscoHost, Pedro, PubMed and ScienceDirect) and searching grey literature.

2.2 IMPROVING HEALTH CARE IN SOUTH AFRICA

South Africa has a rich ethnic and cultural diversity that is marred by a dark past of discrimination based on race and gender (Coovadia, Jewkes, Barron, Sanders & McIntyre, 2009). This was a double problem for women who were already marginalised due to socio-cultural factors (Amollo, 2009). After 82 years of multiracial struggle, democracy was born in 1994 and with it the 'foundation of democratic institutions' and human rights (Coovadia et al., 2009). The history of South Africa has a profound effect on the health care policy and services of the present day, and despite the progress made, the country is still struggling to promote equitable health care (Pillay & Skordis-Worrall, 2013; Coovadia et al., 2009).

Low staff morale, a higher burden of disease linked to HIV/AIDS, and weak health systems management have resulted in erosion of the health care system (Harrison, 2009). It was previously highlighted (Costello, 2002) that by 2020, health care systems in most nations would have to treat more people with illnesses, using less money and fewer staff. Many health care systems that are already under strain will therefore either undergo a transformation or fail (Coiera, 2004). South Africa currently has a two-tiered health care

system – a large public section and a small but fast-expanding private sector (SA Department of Health, 2007b). The private sector, where personnel and finances are concentrated, services the wealthy urban minority, while 68% of the South African population is fully dependent on a public sector health care system (Pillay & Skordis-Worrall, 2013). In South Africa, females (54.1%) have a higher poverty headcount than males (50.4%) (Statistics South Africa, 2012), indicating that more women rely on the public health system. South Africa's history of a substandard health care system dates back to the 1920s, a fact which the government has tried to rectify over a number of years. Finally in 2009, the Advisory Committee on the National Health Insurance was mandated to deliver recommendations regarding a health insurance system, which led to the birth of the National Health Insurance (NHI) (Sekhejane, 2013). In 2011, South Africa launched the Green Paper on the NHI (Sekhejane, 2013), which aims to improve the quality of health care services and provide financial risk protection against health-related catastrophic expenditure for the whole population (Matsotso & Fryatt, 2013).

The NHI will be implemented gradually over a 14-year period that started in 2012 (Sekhejane, 2013) and will consist of three phases, with Phase 1 currently underway. The scope of this system is governed by section 27 of the South African Bill Of Rights, which states that every person has the right "to have access to health care services, including reproductive health care" (The Constitution of the Republic of South Africa, 1996). Although the NHI system has factors that could hinder its efficiency, if it works, it could be a "sustainable method for rolling out an accessible and affordable health care system" (Harrison, 2009).

While the NHI system is being implemented in an effort to improve access to health care, South Africa has a National Developmental Plan for 2030 in place to aid in the efforts to implement the NHI. Of significance to this study are the developmental priorities and methods highlighted in this document for health care, specifically priority 4, which aims to "prevent and reduce the disease burden and promote health" (National Planning Commission 2011). Certain methods said to achieve priority 4, are to provide comprehensive care and improve the health systems management by improving the quality of care (National Planning Commission 2011). Although both these methods are essential, improving the quality of care offered to patients is a focal point, and providing comprehensive care is one of the ways to achieve it.

South Africa has a policy in place that provides the necessary strategy for improving the quality of health care in the country (SA Department of Health, 2007b). The policy on Quality in Health Care for South Africa has several key aims, and of importance to this research is the aim to reduce underlying causes of illness, injury, and disability through preventative and health promotion activities (SA Department of Health, 2007b), which should also be the core of health care systems in order to reduce demands for service (Coiera, 2004). The policy expands on how the aims are to be achieved, with various methods being suggested to ensure that correct clinical preventative services are available as well as research on treatments that work specifically on South Africa's needs (SA Department of Health, 2007b). The policy states that in targeting quality assurance interventions, health professionals and patients should be targeted. Developing expertise in health care professionals, to assist in improving and modernising their practice by means of printed guidelines, was one of the suggestions (SA Department of Health, 2007b). With regard to patients, the policy stated that "providing patients with understandable information about their condition and treatment options has a positive effect on health outcomes" (SA Department of Health, 2007b).

The present research focuses on these aims because the complications described might be preventable, and physiotherapists may be able to reduce the impact of these postoperative problems. In addition, the research will be specific to the needs of the South African population, and generating evidence to develop clinical guidelines will assist physiotherapists to provide effective up-to-date care. This is therefore aligned with the information required to improve the quality of health care set out in the National Developmental Plan for health care, which is also linked to the implementation of the NHI (National Planning Commission 2011).

While the NHI aims to improve the access to health care for all South Africans, women face specific challenges, both social and economic, that also affect their right and access to basic health care. The present injustices are addressed in South Africa's National Policy Framework for Women's Empowerment and Gender Equality, which outlines South Africa's vision for gender equality (The Office on the Status of Women, 2000). The primary indicators highlighted are as follows:

- reduction of women's vulnerability to social injustice such as poverty, HIV/AIDS and violence;
- enhanced access of women to resources for economic development;
- improvement in women's earning power and their involvement in the economy;
- the extent to which women participate in political decision-making;
- a change in attitude to women and enhanced recognition of the value they add to society;
- women's access to professional opportunities.

The recently released Women Empowerment and Gender Equality Bill in South Africa (Republic of South Africa, 2013), despite having received public criticism for not offering anything new to women (Vetten, 2014), does address the indicators highlighted in the framework for women's empowerment and gender equality. While the process is slow, change is imminent and progress is being made. An example is the Prevention of Mother to Child Transmission (PMTCT) programme, which is currently the largest in Africa (SA Department of Health, 2008). A recent evaluation of this programme has shown that it has been successful in reducing the mother to child transmission of HIV in South Africa (Goga, Dinh & Jackson, 2012). While South Africa still grapples with improving the health care system of the country, it is evident that health care providers can play their part and improve the quality of care offered, which is what this research hopes to do through providing evidence to inform the development of clinical guidelines.

2.3 THE ROLE OF CLINICAL GUIDELINES IN HEALTH CARE

Clinical guidelines are defined as systematically developed statements to assist practitioners and patients in making decisions about appropriate health care for specific circumstances (Field & Lohr, 1990), with the aim of disseminating information from high quality studies (van der Weijden, Boivin, Burgers & Elwyn, 2012). Literature (Owens, 1998; Eddy, 1990) has highlighted four types of clinical guidelines:

- Evidence-based approach: this is based on reviewing studies (mainly on RCTs and observational studies) and developers base their recommendations on the selected studies.

- Expert consensus approach: experts in the area meet and develop the guidelines based on their experiences. There is identification of outcomes analysis of evidence or assessment of patient preferences.
- Outcome-based approach: developers utilise methods such as meta-analysis, decision analysis or cost effective analysis to estimate the potential benefit or harm of an intervention.
- Preference based approach: this combines the evidence-based and outcome-based approaches and assesses patient preferences for the health outcome.

In terms of the accuracy of the four approaches, they each have their advantages and disadvantages; the evidence-based approach is more accurate than expert consensus because scientific evidence is used (Owens, 1998; Eddy, 1990). The outcome-based approach is more accurate than the evidence-based approach because it considers the benefits and harms of interventions. Finally, the patient preference approach is more accurate than the outcome-based approach as the patient preferences are considered for management options (Owens, 1998; Eddy, 1990). All the guideline approaches have theirs merits with the categorisation based on the information offered in the guideline (Scalzitti, 2001). However, organisations often combine the evidence-based approach and the expert consensus approach to develop guidelines in areas where there is a dearth of information (Owens, 1998; Eddy, 1990). This study will also adopt the combined evidence-based and expert consensus approach when drawing up the evidence tables due to the paucity of research in this area. Furthermore, the information will be updated as evidence becomes available to improve the scientific rigor of the guidelines.

Over the past decade, the development of clinical guidelines has become increasingly common globally, with its use varying from clinical decision making to rules of operating the hospital and health spending of governments and insurers (Woolf et al., 1999). According to Woolf et al. (1999) countries such as Australia, New Zealand, Europe and North America have an extensive interest in guideline development, particularly in the issues that health care systems face, such as the following:

- increasing demands in health care costs fuelled by more expensive technology;
- an aging population;

- variations in service delivery among hospitals and service providers resulting in inappropriate care from either overuse or underuse of services;
- for patients to receive and health care providers to deliver the best possible care.

In order to ensure the rigour and methodological quality of guidelines the AGREE tool was developed (Brouwers et al., 2010). The AGREE tool consists of 23 items organised in six domains which are used to determine the overall quality of the guidelines (Brouwers et al., 2010), thus creating higher quality guidelines.

In general, South Africa has very few national guidelines for the management of health conditions (http://www.health.gov.za/policies.php). In light of the Health Care Policy (SA Department of Health, 2007b) and the changing health care system in South Africa with the implementation of the NHI system, there should be a multidisciplinary initiative to develop guidelines within the country to ensure that the aims of the policy and NHI are achieved. This includes using the AGREE tool to ensure the development of a high quality guideline. Relevant to this study is the National Institute for Health Clinical Excellence (NICE) caesarean section clinical guideline (NICE, 2012). This could have been adapted to suit the South African population, but while physiotherapy is mentioned postoperatively in this guideline, respiratory physiotherapy is mentioned as being non-essential as a prophylaxic treatment for patients under general anaesthetic (NICE, 2012). Although this is correct, treating respiratory conditions is not the only role of physiotherapists with postoperative patients. What is noteworthy is that although early mobility is mentioned to prevent thromboembolism, there is no mention of a referral to physiotherapy in this regard (NICE, 2012). The possible reason for the lack of referral to physiotherapy is that there is no research that analyses the long-term complications of women post CSD and outlines the role of physiotherapists to prevent these postoperative complications.

The South African guidelines that have been identified, namely: Guidelines for maternity care in South Africa (SA Department of Health, 2007a) and Saving Mothers: policy and management guidelines for common causes of maternal deaths (SA Department of Health, 2001) are more medically based and follow the biomedical approach, which is centred on treating and preventing mortality and morbidity (Engel, 1977). In physiotherapy there is presently a drive within the South African Society of Physiotherapy (SASP) to develop

clinical guidelines with the aim “to lift the image of the physiotherapy profession within the Health Industry”, to improve patient care, and ultimately increase referrals to physiotherapy by proving the profession's importance (South African Society of Physiotherapy, 2012). Task teams in the SASP have been established to achieve this, and in this way the need for clinical practice guidelines in women’s health was recognised. However, in order to provide holistic patient care, the biological aspect must be considered along with the social and psychological aspects. This approach, which is being incorporated into the various disciplines, is known as the 'biopsychosocial model'.

2.4 INCORPORATING THE BIOPSYCHOSOCIAL MODEL INTO CLINICAL GUIDELINES

The biopsychosocial model was proposed by Engel in 1977 as a way of integrating the psychological and social variables into the biomedical model (Engel, 1977). This was done as a means to understand the patient, while ensuring that the biological, psychological and social dimensions of illness are managed. Engel criticised the biomedical model for having a narrow focus leading attending clinicians to view patients as objects, and ignoring the subjective experience of the patient (Engel, 1977). Using the biomedical model, treatments were considered successful if the biological state returned to normal function, but how the patient felt following the treatment was irrelevant (Wood-Dauphinee & Korolija, 2006). Despite criticism the biomedical model has played a vital role in the advancement of medicine, but the present proposed way forward for medicine is using the biopsychosocial approach.

Determining the impact of treatments using patient-reported outcomes is a method of using the biopsychosocial model. This ensures that how a patient functions and feels following a procedure is considered as well as how long they live. Measuring the health related quality of life (HRQoL), symptoms or patient satisfaction (Wood-Dauphinee & Korolija, 2006) are ways to ensure holistic management of the patient. The model or approach is in line with the policy on Quality in Health Care for South Africa (SA Department of Health, 2007b), which highlights that empowering patients by educating them on their condition is key to a positive health outcome. However, this is achieved by first understanding what information is needed, which is best coming from the patient (SA Department of Health, 2007b). Considering the current guidelines offered (SA Department of Health 2001, 2007a) there is still a large

amount of research that needs to be done to ensure that the patient is managed holistically, and South African guidelines also have to consider the HIV-infected population owing to the sheer numbers infected, especially among women (UNAIDS, 2013a).

Through the development of clinical guidelines in women's health, attention will be drawn to preventative interventions to a neglected population and high-risk groups (Woolf et al., 1999). A guideline using the biopsychosocial approach will also assist in improving the postoperative QoL of women, thus enabling them to effectively continue their multifaceted roles. Although there are many areas in women's health that require research, this research is focused on the two most common life-changing operative procedures performed that women, irrespective of social background, will most likely undergo, namely caesarean section and hysterectomy.

2.5 CAESAREAN SECTION

Caesarean section is the "delivery of an infant though incisions in the abdominal and uterine wall" (Haslam, 2004). The term 'caesarean' is thought to have originated from the belief that Julius Caesar was born that way. The procedure was initially introduced as a life-saving technique for both mother and baby (Gibbons et al., 2010). A caesarean section delivery may be classified as 'elective', signifying that it has been selected ahead of labour and membrane rupture due to obstetric complications or emergency, when it is decided that ending the labour is safer for mother and baby (Jamieson et al., 2007; Haslam, 2004). While variations to the caesarean section (CS) technique have been developed over the years (Hofmeyr, Novikova, Mathai & Shah, 2009), there are mainly two types (Haslam, 2004). The first involves a longitudinal incision in the upper uterine segment, the second, which is also the norm, is a Pfannenstiel incision (bikini line or low transverse skin incision) (J. Bell, S. Bell, Vahratian & Awonuga 2011; Haslam, 2004). The latter is also favoured by women for cosmetic reasons (Bell et al., 2011; Haslam, 2004). The Pfannestiel incision is usually made 2 – 3cm above the symphysis pubis with an incision 8 – 12 cm long (Fatušić, Hudić, Sinanović, Kapidžić, Hotić & Musić, 2011).

Despite various authors noting a global increase in the caesarean section rate (Robson, Hartigan & Murphy, 2013; Betrán et al., 2007), there is still considerable controversy around what the appropriate CS rate is (Robson et al., 2013), as the primary use of the procedure is

for pregnancy complications. What they do agree on is that the rate is continually increasing (Lavender, Hofmeyr, Neilson, Kingdon & Gyte, 2012).

2.5.1 Global and national rate of caesarean section deliveries

Caesarean section delivery rates vary considerably between developed and developing countries, with the lack or inaccessibility to health care facilities resulting in an underuse of CSD in developing countries (Betrán et al., 2007). A recent study showed that in developed countries, the CSD rate was 21.1% whereas the rates were only 2% in developing countries (Betrán et al., 2007). However in Africa, South Africa has the highest CSD rates (Betrán et al., 2007), with the national caesarean section rate gradually increasing in the last decade from 12.7% in 2001/2002 to 20.8% in 2012/2013 indicating that a significant number of all births were by this procedure (Massyn et al., 2013). This is higher than the recommended 10% – 15% level set by the World Health Organization in 1985 (WHO, 1985). In KwaZulu-Natal Province (KZN) the delivery rate in 2008/09 was 82.9%, with a CSD rate of 22.5% in district hospitals, which was the highest in the country (Health Systems Trust, 2009). The province has kept this title as the CSD rate increased to 27% in 2012/2013 (Massyn et al., 2013). It is noteworthy that all the districts within the KZN province recorded CSD rates above the national norm of 20.8%, with the highest rate being 79.8% at a central hospital in the eThekwini district (Massyn et al., 2013).

This high CSD rate could be attributed to the large number of high-risk patients attending public hospitals (Naidoo & Moodley, 2009), this being especially true for KZN as it has the highest HIV prevalence rates in South Africa (SA Department of Health, 2011b). However, while a CSD is the preferred route of delivery for reducing mother to child transmission of HIV in women with a high viral load, there is still a debate over the dangers of normal vaginal delivery in patients with an undetectable viral load (Naidoo & Moodley, 2009). This is due to a school of thought that suggests that viral loads in blood may not correlate with the levels in vaginal genital tract secretions (Naidoo & Moodley, 2009). The main reasons for performing a CSD in sub-Saharan Africa have been obstructed labour and poor presentation following previous CSDs (Chu et al., 2012). While the researcher could not find literature on the reasons for CSDs in the South African public sector, in KZN, research conducted in the private sector by Naidoo and Moodley (2009) found that previous caesarean sections, emergency caesarean sections for cephalo-pelvic disproportion and elective caesarean

sections for previous CSD X 2 were the main indicators for a CSD. Because of the increase in these rates, physiotherapists will be exposed to more patients who have undergone a CSD than previously. Specific medical complications have been highlighted in the literature for both HIV non-infected and HIV-infected women (Belfort et al., 2010; Jamieson et al., 2007; Koroukian, 2004; van Ham, van Dongen & Mulder, 1997). However, there is currently no literature available on specific complications that physiotherapy can address in this cohort of patients.

2.5.2 Complications of post caesarean section delivery

The percentage of complications following a CSD has been reported at 36% regardless of type of caesarean section (van Ham et al., 1997). This is also dependent on the patient's general health prior to surgery. Caesarean section deliveries have also been associated with increasing rates of maternal morbidity (Kuklina et al., 2009) sepsis, thromboembolic problems, anaesthetic complications (Bonney & Myers, 2010; Koroukian, 2004) and hospital readmission (Belfort et al., 2010). Specific to South Africa, obstetric haemorrhage, hypertension and pregnancy related sepsis are the major direct causes of maternal death, with obstetric haemorrhage during or after a caesarean section accounting for 26.2% of maternal deaths (Moodley & Pattinson, 2012). Other contributory factors to maternal death that have been identified are the HIV infection (70%) and anaemia (43%) (Moodley & Pattinson, 2012). In terms of HIV-infected women and post-CSD complications, research has suggested that the risk of complications is dependent on the viral load of the patient (Moodliar, Moodley & Esterhuizen, 2007; Panburana et al., 2003). The higher the viral load, the more susceptible the patient is to developing complications post-CSD (Moodliar et al., 2007; Panburana et al., 2003).

A retrospective analysis done in KZN found that there was an overall complication rate of 14.2% among HIV-infected women post-CSD (Moodliar et al., 2007). Medical postoperative complications identified were bladder injury, endometritis, wound sepsis, and postpartum hemorrhage (Moodliar et al., 2007). However this study was done in an era when antiretroviral therapy was not easily accessible. At present, South Africa has the largest antiretroviral rollout globally (UNAIDS, 2013a) and the guidelines from the Department of Health state that all HIV-infection pregnant women are to be given antiretroviral treatment regardless of their viral load (SA Department of Health, 2013). Based on previous research,

the implication is that researchers can now expect the rate of complication of HIV-infected and HIV non-infected women to be similar (Moodliar et al., 2007; Panburana et al., 2003). A type of complication that is similar despite HIV status is urinary incontinence (UI).

There remains a long-standing debate over whether a caesarean section can prevent pelvic floor trauma when compared to vaginal delivery (Chin, Chen, Lui & Wang, 2006). Literature has shown that a CSD cannot completely protect against injury to the pelvic floor area, as pregnancy has been shown to increase the prevalence of UI. This is largely attributed to the increase of mechanical compression on the pelvic floor area during pregnancy (Faundes, Guarisi & Pinto-Neto, 2001; Mant, Painter & Vessey, 1997). There are conflicting studies on the incidence of stress UI following a CSD (Borges et al., 2010; Chin et al., 2006). Research has suggested that women who underwent a CSD are more at risk for developing stress and mixed UI, though women who had a normal vaginal delivery were more at risk for stress UI (Rortveit, Daltveit, Hannestad, & Hunskaar, 2003). Chin et al., (2006) found that women who underwent an emergency CSD were more at risk for developing UI than the elective CSD group. While researchers continue to weigh the benefits and risks of this growing procedure, one aspect that is agreed upon is that a CSD cannot guarantee protection against injury to the pelvic floor (Chin et al., 2006; Rortveit et al., 2003; Faundes et al., 2001; Mant et al., 1997). There are no South African physiotherapy studies that deal specifically with physiotherapy complications post CSD; the present study will bridge that gap, and highlight the relevant aspects that physiotherapists need to address in women post-CSD.

2.5.3 The postnatal quality of life of women post caesarean section delivery and postnatal care

The postnatal QoL based on mode of delivery has received minimal attention (Cheng & Li, 2008; Symon, 2003) when compared to preventing mortalities (Moodley & Pattinson, 2012) and the morbidities of childbirth (Bonney & Myers, 2010; Kuklina et al., 2009; Koroukian, 2004). Despite childbirth not being an illness, it does have an impact on women's health and subsequently their QoL (MacArthur, 1999). Postnatal issues that have been reported affecting the health-related quality of life (HRQoL) of women were: sex-related concerns, hemorrhoids/constipation, anxiety, stress, depression, sleep disorders, endometriosis and urinary incontinence (Cheng & Li, 2008). Most of these problems are said to have been resolved in less than six months (Cheng & Li, 2008). However, there are problems such as

backache and fatigue that persisted beyond six months (Cheng & Li, 2008) meaning that they have become chronic in nature. The poor health of mothers as a result of childbirth are known to negatively affect the physical health of their children under the age of three, and can also lead to behavioural problems (Kahn, Zuckerman, Bauchner, Homer & Wise, 2002). This indicates the importance of researching the impact of CSD on patients' QoL, considering the substantial rise in prevalence rates.

There are only a few studies that have examined the effect of the mode of delivery on the QoL of women, the results of which have been largely inconsistent (Huang, Tao, Liu & Wu, 2012; Torkan, Parsay, Lamyian, Kazemnejad & Montazeri, 2009; Janse et al., 2007). Studies by Jansen et al. (2007) and Torkan et al. (2009) using the SF-36 health questionnaire showed that a normal vaginal delivery (NVD) should be favoured in the absence of medical conditions because participants who had a NVD had scored higher, especially in the physical health section, than the CSD group. In addition Jansen et al., (2007) found that patients who underwent an elective CSD scored the lowest overall when compared to the elective CSD and NVD groups. In contrast a more recent study by Huang et al. (2012) found no difference between the mode of delivery and the QoL of participants. The authors concluded that socio-cultural determinants rather than the operative procedure may influence the postnatal QoL of women (Huang et al., 2012). Although the results differ, the link between all the studies is that, irrespective of mode of delivery, the postnatal QoL of the patients was affected (Huang et al., 2012; Torkan et al., 2009; Janse et al., 2007). At present there are no South African studies in this area, and none during the literature search on HIV-infected compared to uninfected women. One would however anticipate a slightly longer recovery time for HIV-infected women as they have delayed healing (Young & McNaught, 2011).

Postnatal care in this area to improve the QoL thus becomes essential. However, despite input being required from the health care providers responsible for the postnatal care of patients, there is insufficient evidence available on the effectiveness of postnatal management (Albers, 2000; MacArthur, 1999). In South Africa, postnatal care has not been adequately prioritised in the maternal health care service, with the services being task-orientated rather and patient-orientated, which has resulted in impersonal and incomplete patient care (Beksinska, Kunene & Mullick, 2006). Interestingly enough, although this has been established, there has been no recent literature on the current situation of postnatal care in the country.

2.6 HYSTERECTOMY

Hysterectomy, which is the surgical removal of the uterus (Cook, 2004), dates back to ancient times (Sparic, Hudelist, Berisavac, Gudovic & Buzadzic, 2011) and was first succesfully performed in 1853 (Cook, 2004). There are four main types of hysterectomy:

- a subtotal abdominal hysterectomy, where only the uterus is removed;
- a total abdominal hysterectomy, where the uterus including the cervix is removed;
- a total abdominal hysterectomy with bilateral salpingo-oophorectomy, where the uterus, both fallopian tubes and the cervix are removed;
- a radical hysterectomy, where the uterus, both fallopian tubes, the cervix, upper vagina, ovaries, lymph glands and fatty tissue are removed (Sparic et al., 2011; Cook, 2004) (Figure 2.1).

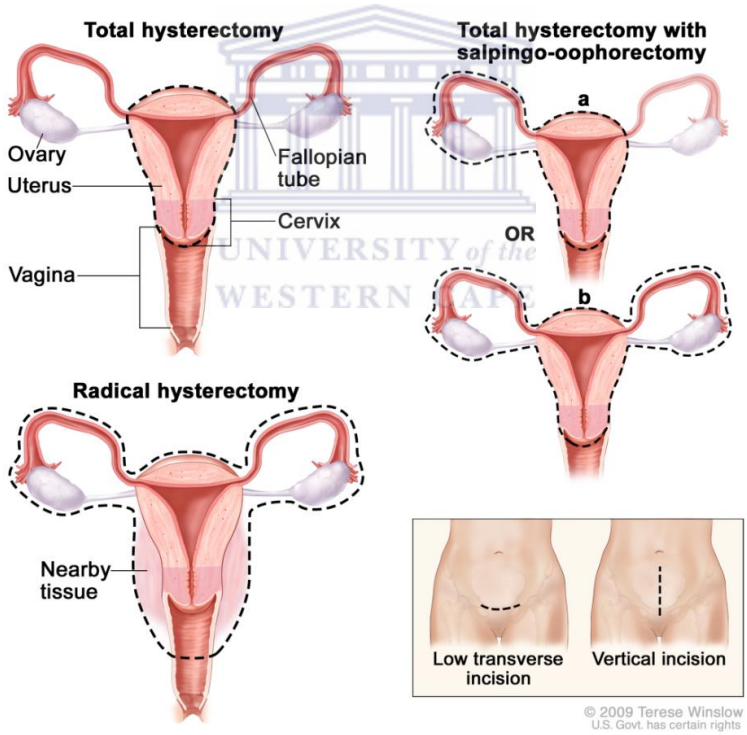


Figure 2.1: Terese Winslow. Illustration of types of hysterectomy

There has been a longstanding debate regarding the operative procedures with the subtotal hysterectomy being preferred over a total hysterectomy for benign conditions because the operation is shorter and there is less intraoperative and postoperative blood loss (Lethaby, Mukhopadhyay & Naik, 2012). However, a recent systematic review (Lethaby et al., 2012)

found no difference in the outcomes in terms of sexual, urinary and bowel function between the two procedures, with women who underwent a sub-total hysterectomy being more likely to experience cyclic bleeding up to a year postoperatively (Lethaby et al., 2012). A radical hysterectomy is performed for malignancies (Forsgren & Altman, 2013). This technique is classified into five types known as the Piver classification, which was fairly recently clarified by the European Organisation for Research (Clayton, 2006). The extent of the surgery or the type selected is dependent on the size of the tumour (Mota et al., 2008).

The procedure can be carried out by different operative routes, namely vaginally, abdominally and laparoscopically (Forsgren & Altman, 2013; Cook, 2004). The selected operative route is usually dependent on the skill of the surgeon, the size of the uterus, and the condition to be treated (Butt, Jeffery & Spuy, 2012; Chrysostomou, 2008; Cook, 2004). At the present time, the abdominal route is still the most common method of performing the hysterectomy (Goolab, 2013), despite it having the highest incidence of postoperative complications (Butt et al., 2012; Nieboer et al., 2009). A systematic review by Nieboer et al. (2009) showed that a hysterectomy should be performed vaginally wherever possible, as it results in a quicker return to normal activities, a shorter stay in hospital, and fewer infections compared to an abdominal hysterectomy. There was no benefit for the laparoscopic procedure over a vaginal procedure, but the laparoscopic procedure resulted in less blood loss, a shorter stay in hospital, and fewer wound infections when compared to an abdominal hysterectomy (Neiboer et al., 2009). The laparoscopic procedure also carries a greater risk of damaging the bladder or ureter, and is a longer operation associated with a higher rate of substantial bleeding (Neiboer et al., 2009). However, regardless of what the literature may suggest, as the hysterectomy prevalence rates continue to rise, the decision of weighing the risks and benefits of performing a laparoscopic hysterectomy rather than an abdominal hysterectomy when a vaginal hysterectomy cannot be performed, rests solely on the skill of the surgeon (Neiboer et al., 2009).

2.6.1 Global and national prevalence of hysterectomy

A hysterectomy is currently one of the most common major surgeries performed on women (Sparic et al., 2011; Davies et al., 2002). On average 600 000 hysterectomies are performed annually in the United States of America, while in the United Kingdom, the figure per annum is approximately 100 000 (Goolab, 2013; Wu, Wechter, Nguyen, Visco & Geller, 2007).

Unfortunately in South Africa there are no nationwide statistics on the hysterectomy prevalence rate (Chrysostomou, 2008), but what is known concerning the prevalence rate is that HIV-infected females are more likely to have a hysterectomy than HIV non-infected females (Massad et al., 2007).

HIV-infected women are more prone to cervical neoplasia (Massad et al., 2007) and cervical dysplasia (Franz, Jamieson, Randall & Spann, 2005), which are conditions that often result in a hysterectomy. Therefore, although the hysterectomy prevalence rate for South Africa is unknown, taking into consideration the high HIV prevalence rates (Statistics South Africa, 2013a) and the fact that HIV-infected women are living longer healthier lives due to improved access to antiretroviral medication and of the drug itself (Cejtin, 2008; Frantz et al., 2005) and are more likely to undergo a hysterectomy (Massad et al., 2007), an increased rate can be anticipated among the HIV-infected women alone (Frantz et al., 2005). This suggests that there will be a substantial increase in the number of women requiring postoperative physiotherapy management. The researcher found no articles specific to post hysterectomy physiotherapy management, but medical complications which physiotherapists can address following the procedure have been highlighted in literature.

2.6.2 Complications post hysterectomy

South African data on the prevalence and complications of hysterectomy are scarce (Butt et al., 2012). In a recent Cape Town-based study, the authors (Butt et al., 2012) identified the immediate postoperative complications as being pyrexia, hemorrhage, wound sepsis, pain, urinary complaints and pulmonary embolism. The number of complications identified by Butt et al. (2012) was higher than in a study in Johannesburg, where the researcher identified three complications in hysterectomy patients postoperatively, namely: deep-vein thrombosis, pyrexia, and wound erythema (Chrysostomou, 2008). However, the Johannesburg sample was substantially smaller (Chrysostomou, 2008) than the Cape Town study (Butt et al., 2012). Complications noted by Butt et al. (2012) six weeks postoperatively were: pain, poor wound healing, urinary tract complications, uterine prolapse, bowel complications, deep vein thrombosis, femoral nerve injury, and tuberculosis. These complications are similar to an international review, with additional complications being gastrointestinal tract injury, femoral, iliohypogastric, ilioinguinal and peroneal nerve injury, and vaginal cuff dehiscence (Clarke-Pearson & Geller, 2013, Garry et al., 2004).

All the aforementioned complications can have a negative impact on patients' QoL over a long term following the surgery. In terms of HIV-infected women, there is no significant difference in the complications experienced between HIV-infected and HIV non-infected women who undergo gynaecological surgery, provided the CD4 count of the HIV-infected women is not too low (Cejtin, 2008; Smith, 2010). HIV-infected patients with a low CD4 count have an increased hospital stay and are at a greater risk of developing postoperative complications such as pneumonia (Cejtin, 2008; Smith, 2010).

The average length of stay following gynaecological surgery has been reported as being four days (Garry et al., 2004). Postoperative chest physiotherapy and mobilization which was first implemented in the early 20th century (Macmahon, 1915) are generally requested by the surgeon to prevent pulmonary complications and deep vein thrombosis, respectively. The postoperative role of chest physiotherapy as a prophylactic treatment in abdominal surgery has been inconclusive, largely as the result of trials with low methodological quality (Pasquina, Tramèr, Granier, & Walder, 2006). While the long-term complications of women post hysterectomy has been receiving some attention, there are still very few national studies (Butt et al., 2012; Chrysostomou, 2008), with physiotherapists being trained to mitigate some of the short- and long-term problems (Mantle et al., 2004) highlighted in these studies. Unfortunately, there are currently no clinical guidelines available internationally or nationally to guide physiotherapists in managing this increasing group of women. There is also a dearth of literature available focusing on specific physiotherapy complications in HIV non-infected and HIV-infected women post hysterectomy. The subsequent sections and chapters will add to this body of literature and aid physiotherapists in making informed management decisions.

2.6.3 The postoperative quality of life of women post hysterectomy and postoperative care

Women often undergo a hysterectomy to improve their and their QoL; unfortunately there is limited evidence internationally (Reitsma, Vandenkerkhof, Johnston & Hopman, 2011) and no evidence locally as to whether the QoL of women does improve following surgery, as most research has yet to measure QoL as a significant outcome variable (Rannestad, 2005). Undergoing a hysterectomy can result in the development of new problems for women, such as incontinence, fatigue, weight gain, anxiety, depression and pelvic pain (Altman, Granath, Cnattingius & Falconer, 2007; Gustafsson, Ekstrom, Brismar & Altman, 2006; DeCherney,

Bachmann, Isaacson & Gall, 2002; Carlson, Miller & Flower, 1994a). This may function as a stressor for some women, resulting in dissatisfaction with life, or trigger a preexisting condition (Yang, Chao, Chen & Yao, 2006). This highlights the importance of evaluating QoL postoperatively because many of the problems are preventable with the correct management.

The majority of the hysterectomy research is focused on which surgical procedure results in an improved postoperative QoL (Janda et al., 2010; Kluivers et al, 2007), which is followed by comparing the QoL of women pre and post hysterectomy (Yang et al., 2006) and more recently comparing the pre and postoperative values with women who have not undergone a hysterectomy (Reitsma et al., 2011). There are at present no studies that evaluate the QoL difference between the HIV status of women despite the increased rate of HIV-infected women undergoing a hysterectomy (Massad et al., 2007). A review by Korolija et al. (2004) of the effect of the various operative procedures showed that the laparoscopic group reported higher satisfaction and a better QoL than patients who underwent an abdominal hysterectomy. In studies that used the SF-36 questionnaire, the review also showed no significant differences in the HRQoL between the patient groups postoperatively after six weeks (Korolija et al., 2004). In research evaluating pre and postoperative results, results indicated that the HRQoL of women significantly improved at six months postoperatively (Reitsma et al., 2011; Yang et al., 2006) and remained constant thereafter (Yang et al., 2006). When compared with normative values, there were domains in both the physical and mental health scales where scores remained lower for the postoperative group, but the results were not significantly different (Reitsma et al., 2011). A key point to note is that most women have a poor QoL preoperatively as a result of their condition, and surgery is usually their last option for benign conditions when non-surgical management has failed (Carlson et al., 1994b). Furthermore, it is often difficult to evaluate the studies as there is variation in the type of hysterectomy (selected according to the condition of the patient) and the operative procedures selected (Reistma et al., 2011; Yang et al, 2006; Korolija et al., 2004). Therefore although the results might not meet the norms of age-matched peers on an individual level, surgery does result in an improvement of QoL (Reistma et al., 2011; Yang et al, 2006).

A closer look at the results of the studies using a generic quality of life tools reveals that the health and physical functioning of women undergoing the procedure were more sensitive to change postoperatively than social or psychological dimensions (Reistma et al., 2011; Yang

et al, 2006; Rannestad, 2005). None of the studies considered the role of preoperative counselling although it was suggested that such counselling might lead to better QoL outcomes (Yang et al., 2006). This begs the question whether a more structured postoperative management would result in improved health outcomes by preventing problems that lead to a poor a QoL. A study evaluating the effect of nursing interventions on the QoL to improve the physical and physiological effect of a hysterectomy on women with gynecological cancer showed favourable results when compared with the non-invention group (McCorkle et al., 2009). This research showed that addressing the postoperative problems that result in a reduced QoL postoperatively needs to be addressed. For physiotherapists, although they are involved in the postoperative management of patients (Mantel et al., 2004), research on postoperative long-term complications that they can address or prevent to improve the QoL, is lacking.

2.7 PHYSIOTHERAPISTS AND THE MANAGEMENT OF PATIENTS POST CAESAREAN SECTION DELIVERY AND POST HYSTERECTOMY

While physiotherapists have been involved in women's health for well over a century (Mantle et al., 2004), there is still a lack of literature on obstetric and gynaecological management. Postoperative medical complications post-caesarean section (Silver, 2010; Moodliar et al., 2007; Chin et al., 2006; Panburana et al., 2003; Rortveit et al., 2003) and post hysterectomy (Butt et al., 2012; Clarke-Pearson & Geller, 2013) have been highlighted in the literature. However, to the researcher's knowledge, there are no articles describing complications specific to physiotherapy in this group of patients.

While physiotherapists are well equipped to address a wide variety of complications and prevent the onset of new ones with the use of manual therapy, exercise and/or electrotherapeutic modalities, there is a dearth of evidence-based literature specific to the management of patients' post-caesarean section and post hysterectomy. The available literature guiding physiotherapists on postoperative management is mainly restricted to transcutaneous electrical nerve stimulation (TENS) (Rakel & Franz, 2003; Reynolds, Gladstone & Ansari, 1987; Smith, Guralnic & Gelfond, Jeans, 1986). A recent comparative study by Karakaya et al. (2012) used an integrated physiotherapy approach to manage patients post CSD. The treatment, which consisted of thoracic expansion, huffing, active lower limb exercises, TENS, connective tissue manipulation, posterior pelvic tilt exercises,

retraining postural awareness, improving straight posture, education on proper body mechanics and pelvic floor exercises, was found to reduce postoperative pain and promote earlier return to ambulation when compared with the control group (Karakaya et al., 2012). However, the sample size was small, treatment was performed on patients who had the procedure under general anaesthesia, the physiotherapy techniques were not individually assessed and the patients were not followed up upon discharge (Karakaya et al., 2012). Physiotherapists often have time restrictions with patients owing to the high numbers and turn-over rates in public hospitals, so it is important to know which techniques are most effective in treating this cohort of patients.

The lack of clinical guidelines and the paucity of research in this area indicate that physiotherapeutic management of women post-CSD and post hysterectomy is primarily based on patient presentation and clinical reasoning. This suggests that complications or potential complications could therefore probably not be addressed using best-practice methods. As there are no standardised physiotherapy management strategies for post CSD and post hysterectomy complications used in South African hospitals, the need to facilitate the process becomes essential.

2.8 PHYSIOTHERAPY AND EVIDENCE-BASED PRACTICE

As the physiotherapy profession evolved, physiotherapists were granted first-line practitioner status. However, the responsibility of accurate diagnosis, prognosis and effective patient care (Herbert, 2005) arose in addition to the new-found autonomy that should be governed by informed decision making. The concept of evidence-based care or evidence-based practice is far from new (Cochrane, 1972) with its rise being prompted by the large variety of methods used in clinical practice (Walshe & Rundall, 2001).

The use of evidence-based practice has been promoted since the early 1990s (Turner, 2001) across all disciplines, and is described as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett, Rosenburg, Gray, Haynes & Richardson, 1996). The physiotherapy profession was criticised just over a decade ago for its use of anecdotal information, lack of research, and limited evidence (Turner, 2001). Since the start of the new millennium, the number of RCTs and systematic reviews in physiotherapy has increased exponentially (Maher, Moseley,

Sherrington, Elkins & Herbert, 2008). There has also been a shift in the profession with the establishment of the Centre of Evidence-Based Physiotherapy in 1999 in Australia and PEDro[tm], which is the physiotherapy evidence database (Sundelin, 2010). The most rigorous method for evaluating interventions in medicine is experimental, randomised, controlled trials (RCTs), (Lindegger, 2009) with the best evidence yielded regarding physiotherapy interventions being from RCTs or systematic reviews of RCTs (Bury, 2003, 1998). While there has been an improvement in the quality of RCTs in physiotherapy over the past decade (Moseley, Herbert, Maher, Sherrington & Elkins, 2011), there is still scope to improve across all the physiotherapy sub-disciplines (Moseley, Elkins, Janer-Duncan & Hush; 2014). With the new wealth of information being generated that should govern decision making when treating a patient, the question that arises is how to keep clinicians up to date with the new research being generated (Maher et al., 2008). Information from previous studies (Iles & Davidson, 2006; Schreiber & Stern, 2005; Stevenson, Lewis & Hay, 2004) shows that physiotherapists often do not use evidence-based research to make informed decisions. This highlights the need for developing clinical guidelines (van der Wees & Mead, 2004) because generating guidelines is an effective way of translating evidence-based knowledge into clinical practice (Sciarra, 2012).

Women's health has started to receive a great deal of attention globally (UN, 2013). A review of RCTs and systematic reviews in the PEDro database showed that Incontinence and Women's Health ranked fifth out of the 11 sub-disciplines in terms of number of reports generated (Moseley et al., 2014), which is a marked improvement considering it was ranked eighth out of ten in 2002 (Moseley, Herbert, Sherrington & Maher, 2002). However, in more recent studies the authors combined incontinence with the Women's health category and did not indicate whether the added incontinence category is unique to females (Moseley et al., 2014), as men also experience anal and urinary incontinence. This further highlights the need to improve and drive research in this area.

2.9 SUMMARY

There are currently no South African clinical practice guidelines available to inform the practice of physiotherapists managing HIV-infected and HIV non-infected women post - caesarean section delivery and post hysterectomy. Women are important members of society whose rights have been overlooked in the past. HIV, violence and poverty are known key

factors that women in South Africa face, and are more susceptible to (Statistics South Africa, 2012, 2013a). Policies and frameworks have been developed to assist in guiding and rectifying the past and current injustices to women (Republic of South Africa, 2013; SA Office of the Presidency, 2000). Using the biopsychosocial approach, patients and health care professionals play an important role in holistic management. The role of health care professionals such as physiotherapists is essential in improving the quality of care offered to women postoperatively and positively affecting their QoL. However, this can only be achieved if they are knowledgeable in the area, which can be accomplished through research and clinical guideline development. Futhermore this is also in line with the South African Quality of Health Care Policy (SA Department of Health, 2007b) and National Development Plan for health care (National Planning Commission, 2011). There is currently a paucity of research surrounding the physiotherapy-related postoperative complications and QoL of HIV-infected and HIV non-infected women post-caesarean section delivery and post hysterectomy, which this research aims to address. The following chapter will focus on the methodology that was used to achieve the aim of the study.

CHAPTER 3. METHODS

3.1 INTRODUCTION

This chapter provides an overview of the methods used in this study, and describes the research design, as well as the framework on which the study is based. The study methods are outlined with respect to the four study phases, with the rationale of the research design, sample size, research tool, pilot study, research process and data analysis being explained for each. The validity and reliability of the data collection tools used are described as well as the ethical issues that were taken into considerations.

3.2. RESEARCH DESIGN

In order to address the research question, the study utilised the quantitative research paradigm to investigate the causes of health problems and to provide answers that will enable medical interventions to be designed (Peat, Mellis, Williams & Xuan, 2002). The overall design of the study was prospective, descriptive and explanatory, with longitudinal, comparative and cross-sectional components being incorporated at the different phases. The research design was based on similar recent studies conducted in other developing countries to identify urinary incontinence (Chin et al., 2006) and the QoL (Torkan et al., 2009) among women post caesarean section delivery and hysterectomy. In the present study, the researcher used a prospective approach, and compared HIV-infected and HIV non-infected women in terms of QoL and possible complications that may arise following a caesarean section delivery and post hysterectomy. The framework adopted in the study (Table 3.1) is an amalgamation of two frameworks, namely the intervention mapping model (Bartholemew et al., 1998) and the framework for clinical guideline development in physiotherapy (Van de Wees et al., 2007) as discussed in Chapter 1 section 1.7. The objectives of the study, framework and data collection tools are outlined in Table 3.1

Table 3.1: Study outline to achieve the research aim

Objectives		Method	Chapter	Phases	
1	To determine the long-term complications of HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.	- Patient files - Short-form 36 (SF-36) - EORTC QLQ-CX24 -Open-ended questions - PFIQ-7	**4**	**1**	Identify long-term complications and quality of life.
2	To determine the quality of life among HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.		**5**		
3	To determine the physiotherapy treatment currently administered to patients post caesarean section delivery and post hysterectomy.	Questionnaire	**6**	**2**	Identify treatment strategies and complications addressed by physiotherapists.
4	To determine the complications currently being addressed by physiotherapists in patients post caesarean section delivery and post hysterectomy.				
5	To identify the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy.	Systematic review	**7**	**3**	Identify current physiotherapy management strategies
6	To identify the most effective management strategies for treating women post caesarean section and hysterectomy using the Delphi method.	Delphi Technique	**8**		
7	To collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post caesarean section delivery.	Collated information from: -Patient questionnaires -Physiotherapists questionnaires -Systematic review -Delphi rounds	**9**	**4**	Collation evidence for physiotherapy clinical practice guidelines development.
8	To collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post hysterectomy.				

3.3 PHASE 1: IDENTIFY LONG-TERM COMPLICATIONS AND QUALITY OF LIFE

In this section the study setting, population and sampling, data collection tools, pilot study, data collection process and data analysis for phase 1 of the study will be described. This phase of the study addressed study Objective 1 to determine the long-term complications of HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy, and Objective 2 to determine the quality of life among HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy respectively.

3.3.1 Study setting

Phases 1 and 2 were conducted at the following public sector hospitals in KwaZulu-Natal:

- Inkosi Albert Luthuli Central Hospital (IALCH),
- King Edward VIII Hospital (KEH),
- Mahatma Gandhi Memorial Hospital (MGMH) and
- R K Khan Hospital.

As mentioned in Chapter 1, this province was selected as it has the highest HIV prevalence rates of all nine provinces (Statistics South Africa, 2013a). Initially, only KEH and IALCH were considered for data collection. However, due to the restructuring of KEH and IALCH and the commencement of the initial data collection period in December 2011, patients from KEH and IALCH were referred and/or transferred to MGMH and RK Khan Hospital. The researcher therefore had to include MGMH and RK Khan Hospital to ensure that a correct reflection of the population was achieved.

- Albert Luthuli Central Hospital is a tertiary hospital and currently the only facility in KZN that performs radical hysterectomies with pelvic lymphadenectomy, and was opened in 2002. On average, 80 hysterectomies and 360 caesarean sections (specialised cases only, which are not considered in the scope for this study) are performed per annum. The hospital has total of 846 beds. The gynaecological ward has 32 beds while the oncology ward has 25.
- King Edward VIII Hospital is the second largest hospital in the Southern hemisphere and opened in 1936, providing regional and tertiary services to the whole of KZN and the Eastern Cape Province. On average, 240 hysterectomies and 2400 caesarean

sections are performed per annum. It is a 922 bedded hospital, while the obstetric and gynaecological ward, excluding the labour ward, is a 130 bedded unit.

- Mahatma Gandhi Memorial Hospital offers regional obstetric and gynaecological services and was opened in 1997. On average, 104 hysterectomies and 3600 caesarean sections are performed per annum. The hospital has 350 beds, with the gynaecological ward being a 32 bedded unit and the obstetric ward having 42 beds.
- RK Khan Hospital is one of the four major hospitals in the Durban area and was established in 1969. On average, 144 hysterectomies and 2400 caesarean sections are performed per annum. It is a 543 bedded hospital, with the obstetric and gynaecological ward being a 64 bedded unit.

3.3.2 Population and sampling

The population for the first phase comprised of patients following obstetric surgery at KEH, MGMH and RK Khan Hospital and gynaecological surgery at KEH, IALCH, MGMH and RK Khan Hospital. The sample size was calculated using a confidence level of 95% and ±5% precision by a qualified statistician. The calculation was based on an article by Watson (2001) using the caesarean section and hysterectomy surgery numbers over a six-month period at KEH and IALCH, which was based on the time allocated to the researcher for baseline data collection. Stratification of the population into HIV-infected and HIV non-infected groups was done prior to calculation by the researcher, based on anecdotal information from the relevant consultants at KEH and IALCH.

The sample size for obstetric surgery (caesarean section) was calculated at 90 and 96 based on 20% variability for the HIV infected and HIV non-infected participants respectively. The gynaecological surgery (hysterectomy) sample size calculated was 37 for both the HIV-infected and HIV non-infected participants based on 10% variability. The variability was based on the inclusion and exclusion criteria as well as anecdotal information from the consultants at the relevant hospitals. The researcher increased the sample size by 30% and rounded the figures to compensate for non-response (Isreal, 1992). This was considered because of the longitudinal nature of the study, with the majority of people attending the selected hospitals living in rural areas and/or informal settlements. The researcher therefore targeted 300 obstetric and 100 gynaecological patients (Figure 3.1).

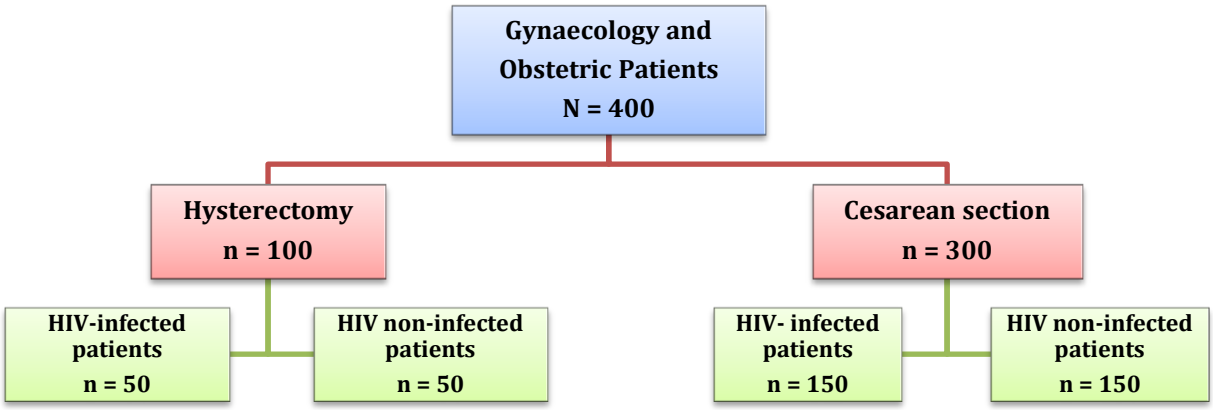


Figure 3.1: Patient stratification

Purposive probability sampling was used to select potential participants, following which participants were scrutinised to ensure that they met the inclusion criteria (Table 3.2 for caesarean section participants, Table 3.3 for hysterectomy participants). The participants selected were then stratified into HIV-infected and HIV non-infected groups.

Table 3.2: Inclusion and exclusion criteria for participants following caesarean section delivery

Inclusion Criteria	Exclusion Criteria
Female	Uncontrolled Diabetes
> 18 years old	Uncontrolled Hypertension
Not currently on TB medication	Morbidly obese females with BMI > 30
No neurological conditions	Uncontrolled Epilepsy
Controlled Diabetes	Neurological deficits
Controlled Hypertension	Cardiovascular problems
No previous cardiovascular diseases	Pre-existing pulmonary problems
No previous or current pulmonary conditions	Requiring other pelvic support surgery
	Chronic lower back pain (> 6 months)
	Urinary or bowel incontinence prior to surgery (>3months)

Table 3.3: Inclusion and exclusion criteria for participants following hysterectomy

Inclusion Criteria	Exclusion Criteria
Female	Uncontrolled Diabetes
> 18 years old	Uncontrolled Hypertension
Not currently on TB medication	Uncontrolled Epilepsy
No neurological conditions	Morbidly obese females with BMI > 30
Medically diagnosed with cervical cancer stage I and II	Cardiovascular problems
Controlled Diabetes	Pre-existing pulmonary problems
Controlled Hypertension	Neurological deficits
No previous cardiovascular diseases	Medically diagnosed with cervical cancer stage III and IV
No previous or current pulmonary conditions	Requiring other pelvic support surgery
	Chronic lower back pain (> 6 months)
	Urinary or bowel incontinence prior to surgery

3.3.3 Data collection tools

In order to address the objectives, several data sources were used to create one questionnaire (Appendix A), namely:

- Patients' files: for data on their socio-demographic details and medical history (Appendix C);
- Short-form 36 (SF-36) health survey questionnaire: to evaluate the patient's quality of life at baseline, month one, three and six (Appendix A, questions 1 – 11);
- European Organisation for Research and Treatment of Cancer Quality-of-Life Questionnaire Cervical Cancer Module (EORTC QLQ–CX24): two questions were extracted to explore the complications that physiotherapy can address at baseline months one, three and six (Appendix A, question 12a and question 12b);
- One open-ended and one close-ended question (included by the researcher): for participants' comments (Appendix A, question 13 and question 14);
- Pelvic Floor Impact Questionnaire short-form7 (PFIQ-7): to determine specific information relating to the pelvic floor post caesarean section delivery and hysterectomy procedure at months one, three and six (Appendix A, question 15).

Each of the tools used will be described below:

a. Patients' files

Permission was obtained from the hospital medical manager and attending consultant to access information from the participants' hospital files, which consisted of the following variables: age, race, marital status and medical history [number of children, number of

previous CSDs, type of procedure (elective vs emergency for the caesarean section and the type and route of procedure for hysterectomy), current level of bowel and bladder function]. This information was clarified with the patient and the attending doctor if necessary

b. The SF-36 health survey

This survey is the most frequently used health-related QoL instrument. This survey instrument assisted in determining the quality of life and the complications that physiotherapy can address following surgery. It consists of eight multi-item scales (35 likert scale questions) that are collated and summarised into two measures: the Physical (PCS) and Mental (MCS) Component Summary scores (Ware, Snow, Kosinski & Gandek, 1993). The eight scales are designed to address the following areas (Ware et al., 1993): assessing physical function (10 items), role limitations due to physical health problems (4 items), bodily pain (2 items), general health (5 items), vitality (4 items), social functioning (2 items), role limitations due to emotional problems (3 items) and emotional well-being (5 items). The questionnaire is a reliable and valid tool, and has been translated in more than 40 countries, which included South Africa (Appendix H for English and Appendx I for isiZulu) (Ware, 2000). The reliability of the questionnaire was determined using both internal consistency and the test–retest methods. With a reliability coefficient range of 0.70 – 0.90 the questionnaire is considered a reliable tool (Ware, 2000). In addition, the questionnaire was deemed valid with studies having yielded content, concurrent, criterion, construct and predictive evidence of validity (Ware, 2000).

c. EORTC QLQ–CX24

The EORTC QLQ–CX24 questionnaire was developed to assess the QoL of women with cervical cancer in clinical trials to be used as a supplement to the 30-item EORTC QoL questionnaire (QLQC30) (Greimel et al., 2006). Two questions were taken from this questionnaire to establish the extent of lower limb swelling and lower back pain among the participants following surgery. The questionnaire is a cross-culturally validated and reliable tool (Greimel et al., 2006). The internal consistencies ranged from 0.72 – 0.87 while the convergent and discriminant validity were fulfilled by obtaining scaling errors below 3%. The selected questions consisted of two Likert scale items, namely the extent of swelling in the lower limb and the extent of lower back pain.

d. Additional questions

Two additional questions were added by the researcher, the open-ended question providing an opportunity to add any other complication or problem as a result of surgery that might not have been covered in the questionnaires and to provide information about the resulting medical attention at baseline, months one, three and six.

e. The PFIQ-7

This is a condition-specific tool that was developed to evaluate the QoL of women with all forms of pelvic floor disorders (Barber, Walters & Bump, 2005). The questionnaire is a valid and reliable tool (Barber et al., 2005). The test-retest reliability had a correlation coefficient range of 0.70 to 0.93, and in terms of validity, the scales "demonstrated significant association with appropriate measures of symptom severity and pelvic floor diagnoses, thereby demonstrating construct validity" (Barber et al., 2005). The questionnaire consists of the following three scales with seven Likert scale items, namely urinary impact questionnaire, colorectal-impact questionnaire, and pelvic organ prolapse impact questionnaire.

As isiZulu is the most commonly spoken home language in KwaZulu-Natal (Statistics South Africa, 2001), questions (Appendix A for English; Appendix B for isiZulu), the information letter (Appendix D for English; Appendix E for isiZulu) and the consent form (Appendix F for English and Appendix G for isiZulu) were translated into isiZulu by a qualified translator (Appendix J). A second qualified translator translated the questions back into English (Appendix K) to ensure that they were not altered in any way. Table 3.4 shows which questions of the composite questionnaire were used to achieve Objectives 1 and 2. The explanatory variables used were extracted from the socio-demographic and medical history section of the questionnaire and is detailed under the data analysis section (3.4.4).

Table 3.4: Questions from the tool relating to the study objectives

Objective	Questions within the tool
1. To determine the long-term complications of HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.	• Questions from medical history (urinary incontinence and bowel problems). • Question 3 (physical functioning) • Question 7 and 8 (Pain) • Question 12 (extent of swelling and lower back pain) • Open ended question
2. To determine the quality of life among HIV-infected and HIV non-infected women post caesarean section delivery and post hysterectomy.	SF 36 questionnaire (questions 1-11), which is sub-divided into: a) Physical health measure b) Mental health measure c) Reported health transition Pelvic floor Impact questionnaire (months 1,3 and 6)

3.3.4 Pilot study

The composite questionnaire was piloted for content and face validity, first by experts in the field, and then by a focus group of women. Experts (N=5) in the area of obstetrics and gynaecology and HIV/AIDS were asked to review the questionnaire for content validity. Two suggestions were: question seven of the SF 36 questionnaire should reflect the pain experienced at the operation site rather than general body pain; and question 14 should have a follow-up question asking why the participants did not seek medical attention for their complications. The researcher concurred that it would be more feasible to address the study question by modifying the questions, which were changed. The original question from the SF 36 read: "How much bodily pain have you had during the past 4 weeks?" the amended question reads: "How much pain have you had during the past 4 weeks at your operation site?" The follow-up request added to question 14 (ie.14b) was "If no, please state the reasons".

A focus group (N=10) was held with women who had undergone the same operation(s), to scrutinise the questionnaires for face validity. The only feedback received was that the word "taxi" be added to question 4 of the PFIQ-7. The original question in the PFIQ-7 read "Ability to travel by car or bus for a distance greater than 30 minutes away from home?" while the modified question reads "Ability to travel by car bus, or taxi for a distance greater than 30 minutes away from home?" Thereafter, a second focus group (N=10) was held five days later where the questionnaire was scrutinised in the same manner by a different group of women. They understood the questionnaire and no faults were reported to the researcher.

3.3.5 Data Collection procedure

In order to identify patients, the researcher went to each hospital, depending on their scheduled operation days, as indicated by the relevant hospitals' obstetric and gynaecology consultants. The ward admission books (patients post-CSD are kept in a separate ward from patients post hysterectomy) were made available to the researcher by the unit managers, and the researcher then used purposive probability sampling to select potential participants. Every second patient in the ward admission books was selected (provided they underwent a CSD and did not have a normal vaginal delivery), however, towards the end of the research, when the researcher needed more HIV non-infected participants, every second or third patient, depending on their status, was selected. The researcher individually approached each patient in a window period of 1 - 3 days postoperatively (following removal of the urinary catheter), and an information sheet was handed to her in either English or isiZulu to read alone, following a short introduction. A registered nurse who was fluent in both English and isiZulu was allocated to the researcher by the unit managers of the respective hospitals and assisted with illiterate patients to eliminate bias and coercion (n=8). The nurse was instructed by the researcher to read the information sheet verbatim to the potential patient, which was done in the presence of a witness (either a family member or a nurse). The researcher was available at all times to answer any questions pertaining to the study and supervised the process. Following this procedure, patients willing to participate were given a consent form to sign. The willing participants hospital files were scrutinised by the researcher to ensure that they met the inclusion criteria of the study. Excluded participants were given reasons why they could not participate in the study. The researcher then proceeded to take socio-demographic and medical information from the participants' files. The participants were asked to confirm or provide information not present in the file. The attending doctor was also asked to clarify medical information in the participants' files.

Participants were then given the composite questionnaire (excluding the PFIQ-7 section, as this was only completed from months one, three and six) to fill as a baseline or initial questionnaire to determine their postoperative level of health. The nurse allocated to the researcher assisted with participants who were illiterate and wanted to participate in the study. Thereafter, the patient was followed up at one, three and six month intervals by the researcher. The follow-up questionnaires were completed according to the patients' requests as well as their geographic locations, with four options being available, telephonic, hand-delivery (geographic dependent, participants needed to reside within the eThekwini area),

posting or emailing the questionnaire. Of the total 411 women who agreed to participate, the following means of communication were chosen preoperatively: 383 telephonic (292 post-CSD, 91 post hysterectomy), 28 hand delivered (18 post-CSD, 10 post hysterectomy).

3.3.6 Data Analysis

The data received from the completed questionnaires were analysed under the guidance of a qualified statistician employed at the university. The data were captured within seven days of being collected, on Microsoft Excel, and subsequently analysed using the Statistical Package for Social Sciences (SPSS version 21). Each participant was given a unique code that only the researcher knew to assist in identifying participants for the subsequent data entries. Questionnaires that were not fully completed were discarded by the researcher. The questionnaires were locked in a filing cabinet, to which only the researcher had access. Descriptive statistics was used to summarise the socio-demographic data from the questionnaire.

Certain questions in the questionnaires were re-coded by the statistician for statistical analysis reasons so that the higher the code, the better the state of health it represented (Table 3.5). The Likert measurement scale options and allocated valued of the items from the SF-36 (questions 1-11) and the EORTC QLQ–CX24 (question 12) components are given in Table 3.5.

Table 3.5: Re-coding and Measurement scales of the SF36 questionnaire (Q1-Q11) and the EORTC QLQ–CX24 (Q12)

Variable	Re-coded	Measurement scale (values and codes)
q1	Yes	poor, fair, good, very good, excellent (1-5)
q2	Yes	much worse, somewhat worse, same, somewhat better, much better (1-5)
q3	No	limited a lot, limited a little, not limited at all (1-3)
q4	No	all , most, some , little, none of the time (1-5)
q5	No	all , most, some , little, none of the time (1-5)
q6	Yes	extremely, quite a bit, moderately, slightly, not at all (1-5)
q7	Yes	very severe, severe, moderate, mild, very mild, none (1-6)
q8	Yes	extremely, quite a bit, moderately, slightly, not at all (1-5)
q9 **a, d, e, h,** **b, c, f, g, i,**	 Yes No	all , most, some , little, none of the time (1-5)
q10	No	all , most, some , little, none of the time (1-5)
q11 **b, d** **a, c.**	 Yes No	definitely true, mostly true, don't know, mostly false, definitely false (1-5)
q12	Yes	very much, quite a bit, a little, not at all (1-4)

In terms of the PFIQ-7 (question 15), all the response variables were on the ratio scale. Each score was the sum of seven ratings (1-4). The responses were recoded so that the higher the code the better the state it represented (Table 3.6)

Table 3.6: Measurement scale of pelvic floor response variables

Variable	Range of values	Measurement scale
Bladder or urine	7-28	Ratio
Bowel or rectum	7-28	Ratio
Vagina or pelvis	7-28	Ratio

For each of the response variables in the questionnaire, the mean was calculated for each of the levels of the explanatory variables over the various time periods (baseline, one month, three month and six month). Table 3.7 demonstrates the response and the explanatory variables. The generalised estimating equation (GEE) for longitudinal data (Zeger & Liang, 1986) were then used to determine the effect of the explanatory variables on the response variables used during data analysis. There were different explanatory variables used for the post caesarean section group and the post hysterectomy group. In the post caesarean section group, for each of the response variables (Q1 – Q12 and Q15) the GEE method (Zeger &

Liang 1986) was applied to the data using time, HIV, time*HIV, age, time*age, number of children, time*number of children, incontinence, number of previous CSDs, time* number of previous CSDs and type of CSD as explanatory variables. In the post hysterectomy group, for each of the response variables (Q1 – Q12 and Q15), the GEE method (Zeger & Liang, 1986) was applied to the data using time, HIV, time*HIV, age, time*age, number of children, time*number of children, incontinence, type of operation, time*type of operation and the site of the operation as explanatory variables. Because the majority of the participants were undergoing a total hysterectomy, the rest of the procedures (sub-total hysterectomy, radical hysterectomy, total hysterectomy with bilateral salpingo-oophorectomy or radical hysterectomy with pelvic lymphadenectomy) were grouped under "other" in order to run the GEE statistical test. The same was done for the site of operation where most of the participants had undergone an abdominal incision and the rest of the procedures (vaginal or laparoscopic assisted vaginal hysterectomy) were grouped under "other".

The entries in the GEE output tables are the test statistics. The results are summarised and presented in the tables and graph format. Owing to the complex nature of the study with regard to data analysis and differences and comparisons, the data were analysed according to various levels of significance. In all the tables showing results of tests, the following references were made to the degree of significance of the results:

* Significant at the 10% level of significance ($1.645 \leq$ test statistic < 1.96)

** Significant at the 5% level of significance ($1.96 \leq$ test statistic < 2.58)

*** Significant at the 1% level of significance ($2.58 \leq$ test statistic < 3.29)

**** Significant at the 0.1% level of significance ($3.29 \leq$ test statistic)

Table 3.7: Variables used in the study

Study	Responses variables	Explanatory variables
Caesarean section delivery	**Health and well-being variables** **SF 36 Questionnaire** ***Physical*** • General health (q1, q11) • Physical functioning (q3) • Physical role (q4) • Bodily pain (q7, q8) ***Mental*** • Vitality (q9) • Social functioning (q6, q10) • Emotional role (q5) • Reported Health Transition (q2) **Pelvic floor impact Questionnaire** • Bladder • Bowel • Vagina	• HIV status • Age • Number of children • Incontinence • Type of caesarean section delivery • Number of previous caesarean section deliveries
Hysterectomy		• HIV status • Age • Number of children • Type of operation • Site of operation

3.4 PHASE 2: IDENTIFY TREATMENT STRATEGIES AND COMPLICATIONS ADDRESSED BY PHYSIOTHERAPISTS

In this section the study design, population and sampling, data collection tools, pilot study, data collection process and data analysis for Phase 2 of the study will be described. This phase of the study addresses Objective 3, to determine the physiotherapy treatment currently administered to patients post caesarean section delivery and post hysterectomy and Objective 4, to determine the complication(s) currently being addressed by physiotherapists in patients post caesarean section delivery and post hysterectomy.

3.4.1 Study design

To achieve these objectives, a quantitative, cross-sectional, descriptive questionnaire survey design was used.

3.4.2 Population and sampling

The population for Phase 2 of the study consisted of a purposive convenient sample of all physiotherapists employed at IALCH (N=14), KEH (N=11), RK Khan Hospital (N=6) and MGMH (N=6) at the time of the study, irrespective of the number of years that they had worked there or elsewhere, or their type of working experience.

3.4.3 Data collection tool

A cross-sectional descriptive study design using a self-administered questionnaire was utilised. The questionnaire used in this phase was based on previous literature (Hay-Smith, Morkved, Fairbrother & Herbison, 2008; Pasquina et al., 2006; Mantle et al., 2004). It contained a mixture of open-ended and close-ended questions (Appendix L), its purpose being to establish how patients who had undergone a caesarean section delivery or hysterectomy were being managed in hospital by physiotherapists, and the postoperative complications being addressed.

The survey was divided into two parts with a total of seven sections. Part one addressed the socio-demographic details of the physiotherapists and the management of patients' post-CSD, while part two addressed the management of patients' post hysterectomy. All the sections comprised of closed and open-ended questions.

The four sections in part one (post-CSD) were:

- Section A: demographic details of the participants;
- Section B: number of patients treated post caesarean section delivery;
- Section C: physiotherapy management post caesarean section delivery;
- Section D: referral to members of the multidisciplinary team and discharge advice.

Three sections in part two (post hysterectomy) were:

- Section A: number of patients post hysterectomy treated and reasons for not treating patients;
- Section B: physiotherapy management post hysterectomy;
- Section C: referral to members of the multidisciplinary team and discharge advice.

3.4.4 Pilot Study

A pilot study was conducted to determine the validity and reliability of the questionnaire. Five experts in the area of women's health were asked to review the questionnaire for content validity. The experts were selected on the basis that they had to be presently involved in the area of women's health, were registered as part of South African Society women's health special interest group (n=2) and/or were academics involved in women's health (n=3). Following the review minor changes were made to the questionnaire. The changes were that 'mobilisation' and 'pelvic floor exercises' be included as part of the treatment selection question for both sections of the questionnaire. This was followed by a focus group discussion for face validity with five physiotherapists working in private practice and presently involved in women's health; no problems were noted. Finally, the reliability of the study using the test-retest method was conducted among another group of physiotherapists (N=15) employed in a regional public hospital who were not part of the study. The results of the pilot study were not included in the study. Repeatability analysis was undertaken using McNemar test between the same questions at pre- and post-test stage. No statistical difference ($p = 1.00$) was noted between the responses pre- and post-test.

3.4.5 Data collection process

All the physiotherapists employed in the hospital were included in the study. The heads of the respective hospitals allocated the researcher a time-slot to verbally address the physiotherapists and conduct the study. The researcher provided the potential participants with an information sheet (Appendix M) to read, and explained the aim of the study, its significance and benefits. The researcher then addressed all questions and concerns relating to the study. All physiotherapists who agreed to participate in the study were given a consent form to sign (Appendix N), while those who did not want to participate could leave. The self-administered questionnaire was then given to the participants to complete. On average the questionnaire took 30 minutes to complete, and the researcher was available to address any queries. Following completion of the questionnaire, the participants put the questionnaires and the consent forms into separate sealed boxes and exited the venue. The sealed boxes were removed from the venue by the researcher, following which, the questionnaire along with the signed consent forms were stored in a locked filing cabinet for data capturing.

3.4.6 Data Analysis

The data received from the completed questionnaires were analysed under the guidance of a qualified statistician. The data collected were captured within seven days of being collected on Microsoft Excel and subsequently analysed using the Statistical Package for Social Sciences (SPSS version 21). Each questionnaire was given a unique serial number, which correlated with the number on Microsoft Excel. The number allowed the researcher to identify the questionnaire should any problems arise later on. The questionnaires that were not fully completed were discarded by the researcher. The questionnaires were locked away in a filing cabinet, to which only the researcher had access. Descriptive statistics was used to summarise the results. Inferential statistics was used to examine the relationship between the different variables. The level of significance was set at 0.05. For the open-ended questions, content analysis was descriptive in reporting how many times certain phenomena were mentioned.

3.5 PHASE 3: DETERMINE CURRENT PHYSIOTHERAPY MANAGEMENT STRATEGIES

This phase of the study addressed objective 5 and 6 of the research, which was to determine the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy, as well as to determine the most effective management strategies for treating women post caesarean section and hysterectomy using the Delphi method.

3.5.1 Methodology for Objective 5

A systematic review was conducted of both local and international literature to address the research objective. The articles to be reviewed were systematically collected and reported in a narrative form. Before the commencement of the review, a systematic review protocol was drawn up in order to guide the process (Appendix O).

The research questions for this phase were:

- To determine what physiotherapy technique(s) are used to prevent or treat postoperative complications in patients following a caesarean section delivery.
- To determine what physiotherapy technique(s) are used to prevent or treat postoperative complications in patients following a hysterectomy.

3.5.1.1 Inclusion and exclusion criteria

The inclusion criteria for the journal articles were:

- Written in English.
- All articles until September 2012 (end of systematic review).
- International and national.
- Women must be more than 18 years old.
- Relevant trials to compare physiotherapy intervention(s) with no intervention or with each other.
- Interventions need to be administered more than once to the participants.
- Physiotherapy intervention(s) to prevent or treat urinary dysfunction post-surgery (caesarean section and hysterectomy).
- Physiotherapy intervention(s) to prevent or treat respiratory complications post-surgery (caesarean section and hysterectomy).
- Physiotherapy intervention(s) to prevent or treat lower back pain post-surgery Physiotherapy interventions to prevent or reduce swelling following surgery (caesarean section and hysterectomy).
- Effect of physiotherapy intervention on a patient's QoL following caesarean section delivery or hysterectomy.

The exclusion criteria were:

- Inadequate randomisation methods.
- Trials with patients with uncontrolled medical conditions.
- Trials with patients with no differentiation in the results between type of delivery or mode of surgery.
- Case studies.
- Pilot studies.

The articles selected were then critiqued according to Population, Intervention, Comparison, Outcome, Type of question being asked (therapy, diagnosis, prognosis, harm, etc.) and the best Type of study design for that particular question (PICOTT) (Table 3.8) to improve the relevance of search results (Schardt, Adams, Owens, Keitz & Fontelo, 2007).

Table 3.8: PICOTT criteria for caesarean section and hysterectomy article selection

Headings	Criteria
Population	▪ Women ≥ 18 yrs post caesarean section delivery ▪ Women ≥18 yrs post hysterectomy
Intervention	▪ Physiotherapy intervention ▪ Physiotherapy intervention for incontinence ▪ Physiotherapy intervention for incontinence and pelvic floor dysfunction ▪ Physiotherapy intervention for LBP ▪ Physiotherapy intervention for swelling ▪ Physiotherapy intervention for respiratory complications
Comparison	▪ No intervention ▪ Education ▪ Another intervention
Outcome	Self-reported and/or measureable outcome in: • Quality of life • Incontinence. • LBP • Swelling
Type of Question	▪ Does Physiotherapy intervention improve the patient's condition? ▪ Does Physiotherapy intervention improve the patient's Quality of life?
Types of Studies	▪ Randomised controlled trails ▪ Cohort Studies ▪ Quasi –experimental studies

3.5.1.2 Data collection process

The databases used to conduct the search were MEDLINE, CINAHL, Cochrane library, and PEDro, as suggested by van de Wees and Mead (2004). The Science Direct database was also used to broaden the search, while grey literature was searched using PubMed, online conference proceedings from the World Confederation for Physical Therapy (WCPT), and the use of the snowball method where the references of the articles selected for review were searched (Giustin, 2012) as well as electronic citations tracking. The use of the CINAHL database was also considered as searching for grey literature (Giustin, 2012). The researcher also posed the question on ResearchGate for other researchers to suggest articles as well as contacting an international physiotherapist who is an expert in Women's Health to suggest articles. As per the World Conference of Physiotherapy website, the following guideline sites were also searched: Australian government, Canadian Medical Association information base of clinical practice guidelines, eGuidelines which was redirected to NICE, NICE, Guidelines international network, L'agencenationaled'accréditation et d'évaluation en santé (National French Guidelines), National Library for Health guidelines database which was redirected to

NICE, New Zealand Guidelines Group, Scottish Intercollegiate Guidelines Network, US National Guidelines Clearing House, and the Guidelines and Audit Implementation Network.

The review included articles that were published in English prior to and including September 2012 (end of systematic review search), articles being identified based on the research questions. Search terms were selected based on the research question, and Boolean words as well as truncation were used as part of the search strategy. The phrase 'caesarean section' was interchanged with the American spelling (caesarean section) and British spelling (caesarean section) (Appendix O). Where articles were not available on the UWC electronic database or the search was limited, the researcher had access and retrieved the information from either the University of Cape Town, University of KwaZulu–Natal or University of Witwatersrand electronic database. The search terms used in the guidelines search engines were simplified due to the nature of the site (Table 3.9).

Table 3.9: Caesarean section and Hysterectomy key words

Caesarean section search words	Hysterectomy search words
Cesarean section OR caesarean section	Hysterectomy
Cesarean section and physiotherapy OR caesarean section and physiotherapy	Hysterectomy and physiotherapy
Cesarean section and physical therapy OR caesarean section and physical therapy	Hysterectomy and physical therapy

The articles selected were critiqued according to the PICOTT criteria (Table 3.8). While RCT's remains the most rigorous method to evaluate interventions (Lindegger, 2009), the paucity of research in this field led the researcher to include cohort study designs and quasi-experimental study designs. The search was conducted independently by the researcher and a research assistant, with no discrepancies being noted in the exclusion of articles.

3.5.1.3 Data analysis

Following the inclusion/exclusion process, the researcher and research assistant independently used the PEDro tool to critically analyse the methodological quality and reliability of the selected articles, with discrepancies in the scoring discussed verbally until consensus was reached. The articles were then summarised in a narrative table format by the researcher. To eliminate bias and error, the reviews were conducted independently. The entire process was overseen by the supervisor, who also independently audited the process and the

articles. The outcome of the systematic review is summarised in evidence tables that were drawn up by the researcher (Chapter 7). The information from this phase played an important role in providing evidence for the development of the clinical guidelines.

3.5.2 Methodology for Objective 6

In an effort to improve the quality of care provided to women postoperatively due to the paucity of literature yielded in this area by the systematic review, this phase of the study was adapted by the researcher to assist in providing evidence for developing clinical guidelines based on expert opinion. As there is no literature detailing the physiotherapy complications of women post caesarean section and post hysterectomy, the results from Phase 1 of the study were collated and presented to the Delphi panel to assist in developing the clinical guidelines for the management of HIV-infected and HIV non-infected women following obstetric and gynaecological surgery. This addressed study Objective 6, namely to determine the most effective management strategies for the treatment of women post caesarean section and hysterectomy using the Delphi method.

The Delphi method is a well-recognised research tool for solving problems in the health care setting (Fink, Kosecoff, Chassin & Brook, 1991). Specific to this research, the Delphi technique was selected to address the incomplete state of knowledge in this area (Delbecq, van de Ven & Gustason, 1975) though the pooling of expert opinion in this area that would not have been possible because of the geographical spread of the experts (Hsu & Sandford, 2007). The Delphi technique comprises several rounds, with each round informing the next. The initial round begins with an open-ended questionnaire that serves to extract specific information about the desired field from the participants (Hsu & Sandford, 2007). The researcher then collates the information into a structured questionnaire for the subsequent rounds, where the participants are requested to rate or rank the statement, usually using the Likert Scale (Hsu & Sandford, 2007; Stitt-Gohdes & Crews, 2004). Two rounds were used to collect the information for this study as two or three rounds are preferred for a Delphi (Green, Jones, Hughes & Williams, 1999; Proctor & Hunt 1994), because too many rounds may cause sample fatigue and tax resources (Schmidt, 1997).

3.5.2.1 Study population

Literature has suggested that a panel of 10 – 15 participants is sufficient to obtain consensus in a homogeneous group of participants (Hsu & Sandford, 2007). Women's Health is a niche area in physiotherapy. The researcher purposively selected 20 physiotherapists who would be considered 'experts' in the field. They were either currently involved in guideline development, academics involved in women's health, and/or were active members in the South African Society of Physiotherapy's Women's Health Special Interest Group. Three internationally recognised experts in the field of women's health were also identified and requested to participate in the study. The selected group was initially approached telephonically (n=6), via appointment (n=3) or via email (n=11). Thirteen physiotherapists in total responded and agreed to be panel members, two of whom were international.

3.5.2.2 Data collection tools and process

The Delphi consisted of two rounds, which were conducted in several steps, with the information from round one used as a basis for round two. Figure 3.2 indicates the flow of the Delphi study.

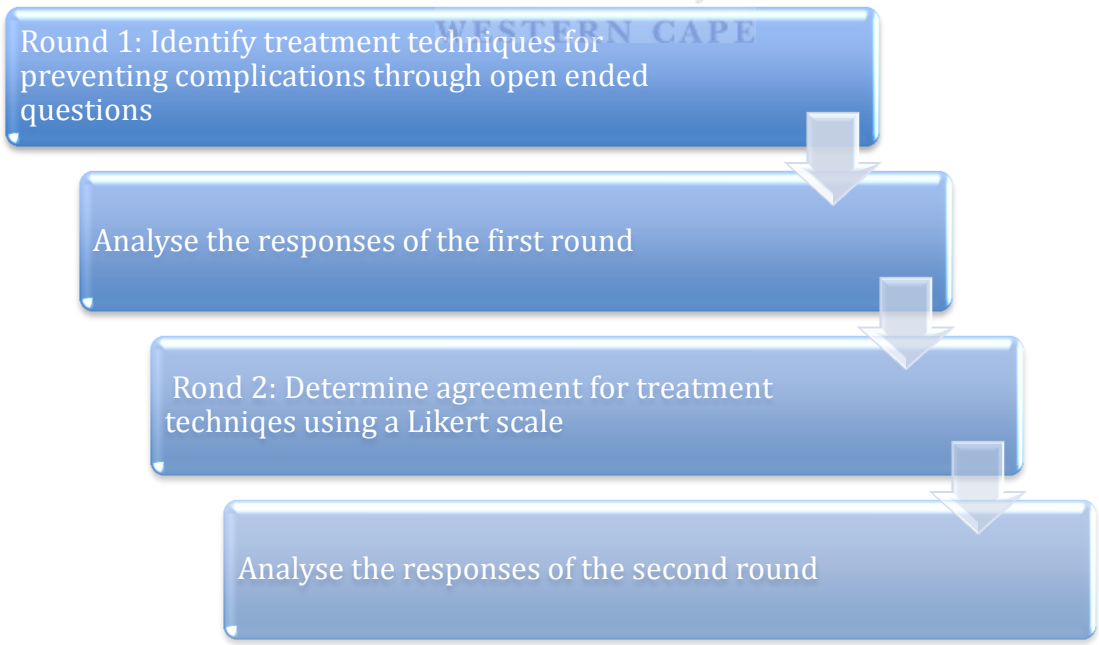


Figure 3.2: Steps in the Delphi study

The process will be explained below. a. Delphi round 1 and b. Delphi round 2.

a. Delphi round 1

The first round sought to determine treatment techniques or strategies related to treating or preventing complications identified in phase 1 using an open-ended questionnaire. The aim of this round was to obtain a list of the common treatment techniques or strategies identified and then rank them in round two. The questionnaire was piloted for content and face validity by six physiotherapists (academic physiotherapists n=2; private practice physiotherapists n=2; public physiotherapists n=2) who were not included in the study. Feedback received included minimal grammatical corrections, which were amended on the questionnaire and a recommendation to include "Have you had post-graduate training in women's health?" No other comments were made. The questionnaire was then given to a different set of six physiotherapists for scrutiny and no problems were found.

The survey began with the researcher sending out an electronic invitation to participants, which also included the study details. Upon reading the study details the selected physiotherapists were requested to provide online consent via the survey created by the researcher on GoogleDrive™ (Appendix P). Participants were only linked to the survey once individual online consent was provided. In round one an electronic questionnaire was created on GoogleDrive™. The survey comprised a mixture of multiple choice questions and open-ended questions. The questions took ≤ 30 minutes to complete and were divided into three sections:

- Section A: demographics (multiple choice) and qualification (open-ended)
- Section B: complications of women post-CSD (open-ended)
- Section C: complications of women post hysterectomy (open-ended)

This round lasted for three weeks, during which the researcher sent out four reminders.The responses were collated and presented in round two for ranking.

b. Delphi round 2

The collated information from round one was presented to the panel (round two) using a likert scale in order to measure the level of agreement about which management strategy the panel were most likely to use and why (Appendix Q). The complications found in phase one of the study were presented verbatim as per round one, with treatment and modality options for the panel to select. A five point balanced Likert scale commonly

used in research (Hartley, 2014), was utilised in this study with 1 representing 'very unlikely', 2 representing 'unlikely', 3 representing 'neutral', 4 representing 'likely', and 5 representing 'very likely'. A balanced scale with a ‘midpoint’ was preferred with equal favourable and unfavourable responses (Friedman & Amoo, 1999). The midpoint of the scale usually ‘neutral’ is important as its absence could result in distortion of the results (Garland, 1991). The scale items were rated from low to high with the negative items on the left and positive on the right (Hartley, 2014). The scale was used to determine the level of agreement amongst the panel members, which also provided the researcher with insight into the management techniques for that specific complication. In this round, the panel members were exposed to the other panel members' input, and could select how ‘likely’ they were to use that specific modality to treat the complication presented, while still retaining anonymity (Hsu & Sandford, 2007).

The questionnaire was scutinised for content and face validity by five physiotherapists (academic physiotherapists n=3; private practice physiotherapists n=2). The comment received was to add the request “please state the reason(s) behind the 'very likely' and 'likely' selections” at the end of each section, which was done. No other comments were made. This questionnaire consisted of two sections that comprised of mixture of multiple-choice and open-ended questions, which took ≤ 30minutes to complete:

- Section A: Management of patients post caesarean section and
- Section B: Management of patients post hysterectomy

This round lasted for three weeks during which the researcher sent out four reminders. The information received was then collated by the researcher and used to provide evidence for the development of the clinical guidelines based on clinical expertise and current literature.

3.5.2.3 Data Analysis

For Delphi round 1, the researcher collated the responses (modalities and treatment techniques) by grouping them quantitatively. In Delphi round 2 the raw data were captured and cleaned on Excel, following which it was exported for analysis using SPSS V21. Analysis was done using descriptive statistics. Although all central tendencies are favoured when interpreting the results, the use of the median (Jacobs, 1996) and mode (Ludwig, 1994) are generally preferred. The reasoning is simply that the median “best reflects the convergence of opinion” compared to the mean, whereas the mode is useful when there is

convergence at two or more points, as the mean and median could be misleading in this situation (Ludwig, 1994). The researcher used percentages, mean, median and mode to determine consensus among the panelists. The percentage used was the level of agreement, which was determined by adding the 'likely' and 'very likely' scores. There was no set percentage set by the researcher owing to the lack of literature on the topic. Convergence and the level of agreement was used to determine how favoured the treatment option was.

3.6 PHASE 4: COLLATION EVIDENCE FOR PHYSIOTHERAPY CLINICAL PRACTICE GUIDELINE DEVELOPMENT

The final phase of this study addressed objectives 7 and 8, being to collate the evidence to inform the development of physiotherapy guidelines for treating of HIV-infected women and HIV non-infected women post caesarean section delivery and post hysterectomy. The information was based on the collation of evidence from Phases 1, 2 and 3 of this study and will be presented in evidence tables in Chapter 9. The AGREE tool is also presented in Chapter 9 to assess the extent to which the information meets the criteria for guideline development.

3.7 ETHICAL CONSIDERATIONS

The following ethical considerations were observed:

- Permission to conduct the study was sought from the Faculty Higher Degrees Committee at the University of the Western Cape and the Senate Higher Degrees Committee (Appendix R).
- The study was conducted according to ethical practices pertaining to the study of human subjects as specified by the Faculty of Community and Health Sciences Research Ethics Committee of the University of the Western Cape.
- Once ethical clearance was obtained, the researcher provided the necessary documentation and obtained permission from the Head of the Physiotherapy Department and the Head of the Obstetrics and Gynaecology Department at IALCH, KEH, MGMH and RK Khan Hospital. Permission was then granted from the hospital managers of IALCH, KEH, MGMH and RK Khan Hospital.

- The hospital permission letters (IALCH, KEH, MGMH and RK Khan Hospital) and the ethical clearance letter were sent to the eThekwini District office and then to the KZN Department of Health for approval to conduct the study.
- Once approval was granted from the KZN Department of Health, the researcher provided the hospitals mentioned with a copy of the approval letter (Appendix S). Thereafter, the researcher arranged times with the physiotherapists, the ward sisters, matrons and consultants, and data collection commenced.
- The participants (patients and physiotherapists) were given an information sheet in a language they could read and understand (Appendix D, Appendix E and Appendix M). Written and verbal consent was obtained by the researcher before commencement of the study (Appendix F, Appendix G and Appendix N).
- For the Delphi survey, the panel members were requested to provide online consent via the survey created on GoogleDrive™. Panel members who did not give consent were not allowed to continue with the survey and were automatically exited from the site.
- The researcher was available to answer all questions and concerns about the study. The participants were assured of confidentiality and anonymity. The participants were allowed to withdraw from the survey at any time and did not need to fear victimisation.
- Once the completed questionnaires and consent forms were received, they were locked in a filing cabinet, to which only the researcher had access. Data stored on the computer were password protected by the researcher. Counselling was offered to the participants if they were negatively affected by the study in any way.

3.8 SUMMARY

This chapter outlined the phases of the study according to the framework of the study. The reasoning behind the choice of methodology to achieve the research objectives was also described. The subsequent chapters will focus on the results before finally drawing to a conclusion.

CHAPTER 4. THE LONG-TERM COMPLICATIONS AND QUALITY OF LIFE ACCORDING TO WOMEN FOLLOWING CAESAREAN SECTION DELIVERY

4.1 INTRODUCTION

The first phase of the study addressed Objectives 1 and 2. This chapter will address the long-term complications and quality of life of HIV-infected and HIV non-infected women post caesarean section delivery (CSD), while Chapter 5 will address the long-term complications and quality of life of HIV-infected and HIV non-infected women post hysterectomy. The results, discussion and conclusion are presented in this chapter.

4.2 RESULTS

This section will present the results of the combined questionnaire that consisted of 15 questions. It is presented in the following sections: socio-demographic profile of participants; long-term complications specific to physiotherapy experienced by HIV-infected and non-infected women post caesarean section delivery; the quality of life of HIV-infected and non-infected women post caesarean section delivery; and the health- seeking behaviour of HIV-infected and non-infected women post caesarean section delivery.

4.2.1 Socio-demographic and medical profile of participants post caesarean section delivery

A total of 310 participants (HIV-infected n=155, HIV non-infected n=155) were evaluated at baseline level. The overall attrition rate was 9 participants (2.9%; Figure 4.1).

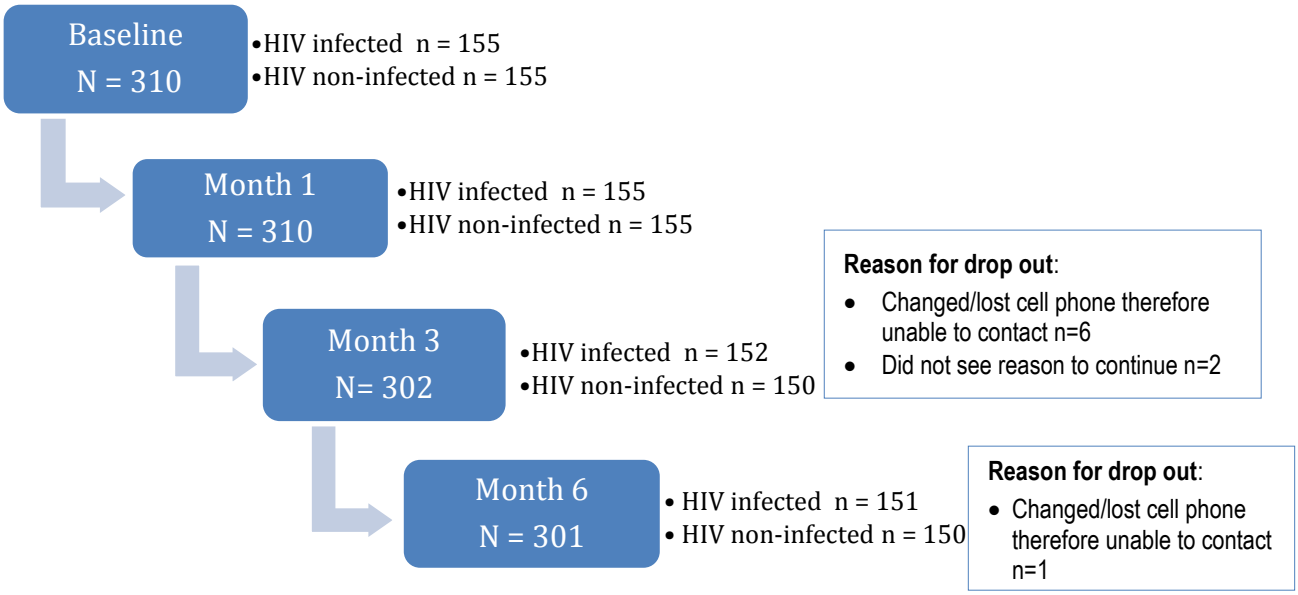


Figure 4.2: Attrition rate of participants over six-months

The ages of the participants ranged from 18 to 43 years with a mean age of 26.49 years (SD ± 5.52). There were no significant differences (p=0.069) between the mean ages of the HIV-infected and non-infected group. With regard to the various race groups, 89%(n=276) were African, 8.1% (n=25) were Indian, and 2.9% (n=9) were Coloured (mixed ancestry). Eighty-three per cent of the participants (n=258) had never been married, while 17% (n=52) were married. There was a significant statistical difference between the marital status of the HIV-infected and HIV non-infected participants (p=0.000), with more HIV non-infected participants being married (n=39). The mean number of children the participating mothers (N=310) had was 3.01 (SD ± 0.96). A significant association (p=0.027) between the number of children and the HIV status of the participants was found where the HIV non-infected participants were found to have given birth to fewer children than the HIV-infected participants. The demographic data are represented in Table 4.1

Table 4.1: Demographic profile of participants post-CSD

Variables	HIV non-infected n=155	HIV infected n=155	Total N =310 (%)
Age			Mean = 26.49 SD ±5.52
Race			
African	123	153	276 (89%)
Coloured (mixed ancestry)	8	1	9 (3%)
Indian	24	1	25 (8%)
Marital status			
Never been married	116	142	258 (83%)
Married	39	13	52 (17%)
Number of children			
0	1	0	1 (0.3%)
1	62	46	108(34.8%)
2	45	67	112(36.1%)
3	38	31	69 (22.3%)
4	8	8	16 (5.2%)
5	1	2	3 (1%)
Other	0	1	1 (0.3%)

The majority (n=303; 98%) of participants had undergone previous caesarean section deliveries, with over half (n=165; 53.2%) being emergency caesarean section deliveries. However, there was no significant statistical difference (p=0.56) between the HIV-infected and non-infected participants and the type of CSD (Table 4.2).

Table 4.2: Caesarean section delivery profile of participants

Variables	HIV non-infected n=155	HIV-infected n=155	Total N =310 (%)
Number of previous CSDs			
0	3	4	7 (2.3%)
1	93	97	190 (61.3%)
2	47	46	93 (30%)
3	12	8	20 (6.5%)
Other	0	0	0
Type of CSD			
Emergency	80	85	165 (53.2%)
Elective	75	70	145 (46.8%)

4.2.2 Long-term complications specific to physiotherapy experienced by HIV-infected and non-infected women post caesarean section delivery

For comparative reasons, the means of Questions 3, 7 and 8 were converted into percentages (Table 4.3). Question 3 determined the physical functioning of the participants, while Questions 7 and 8 determined the amount of pain at the operation site and the extent to which the pain interfered with their normal work, respectively. At baseline, the participants scored the lowest in physical functioning (47.3%). After six months, the overall results indicated that the participants scored the lowest in Question 7 of the bodily pain scale (78.3%). The results also showed that at the six-month point, 81.7% of participants (n=246) felt no pain, while 18.3% (n=55) felt 'mild pain' at the operation site.

Table 4.3: Percentages for physical functioning and bodily pain

Time	Physical functioning	Bodily pain	
	Q3	Q7	Q8
Baseline	47.9%	49.2%	53.4%
1	88.9%	78.2%	81.8%
3	94.7%	90%	94.4%
6	98.1%	97%	99%
Mean average over 6 months	82.2%	78.3%	82%

Question 3 determined the physical functioning of participants post-CSD, with Figures 4.2 – 4.5 presenting the results at baseline and over the six-month time-period. The results from Figures 4.2 – 4.4 and Table 4.3 show a marked improvement in the participants from baseline to month one, and from month one to month three. At the six-month point (Figure 4.5), 33.2% (n = 100) of participants still struggled with performing vigorous activities, while 14.3% (n = 43) struggled with bending, kneeling or stooping six-month post-CSD (Figure 4.5).

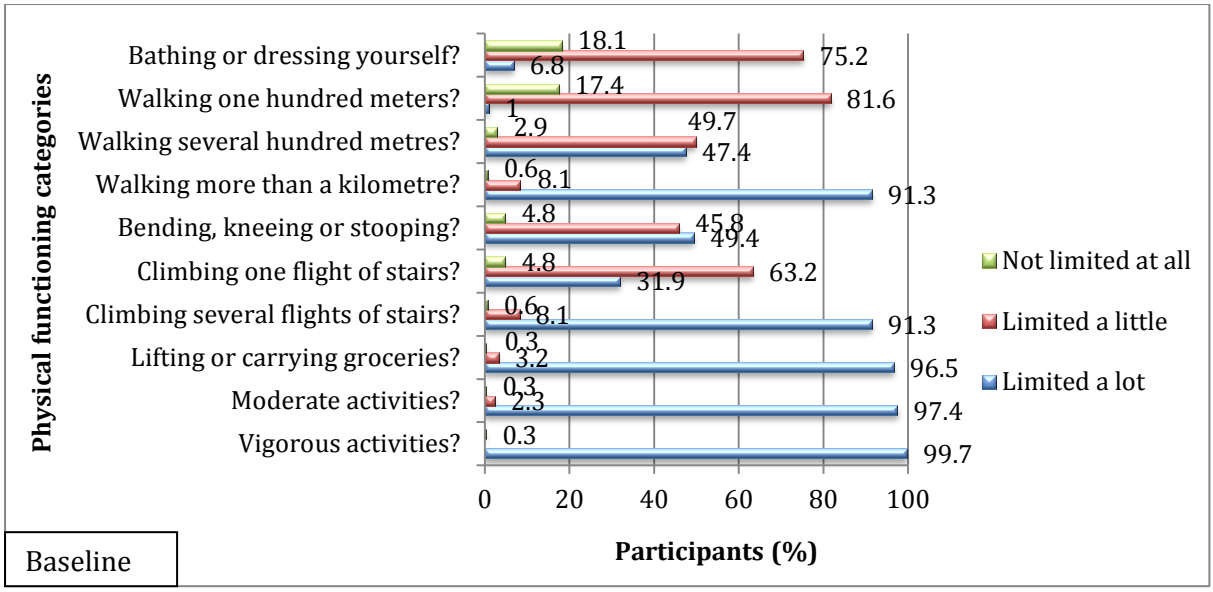


Figure 4.2 Physical functioning at baseline (N=310)

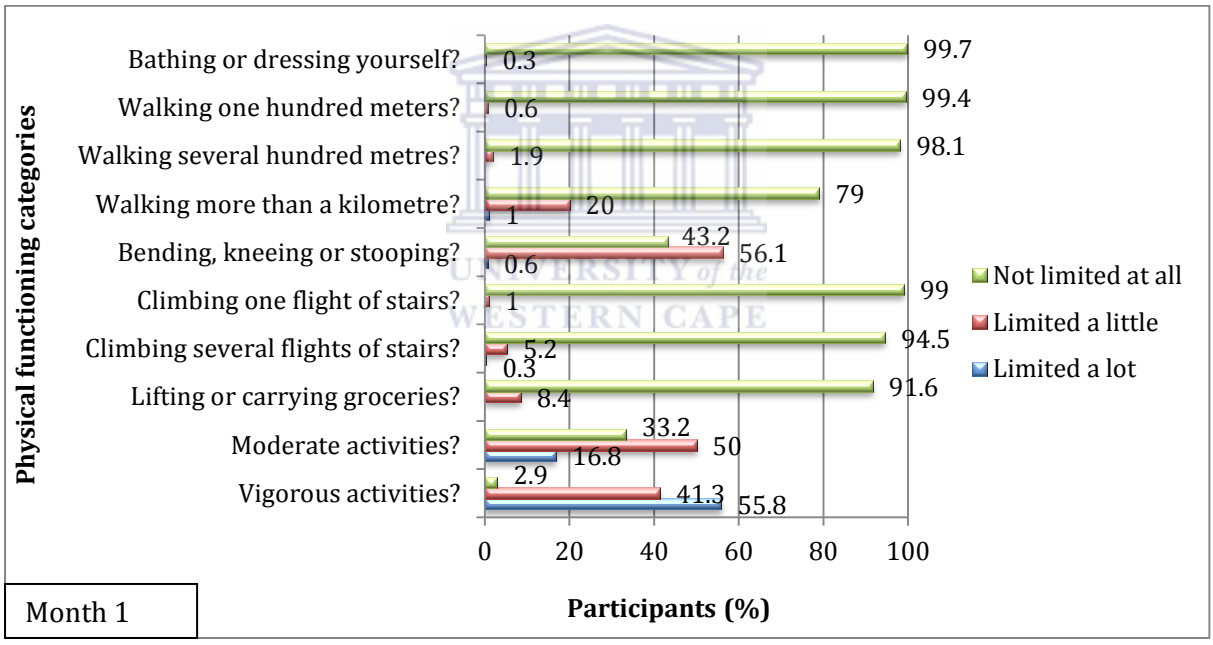


Figure 4.3 Physical functioning at month one (N=310)

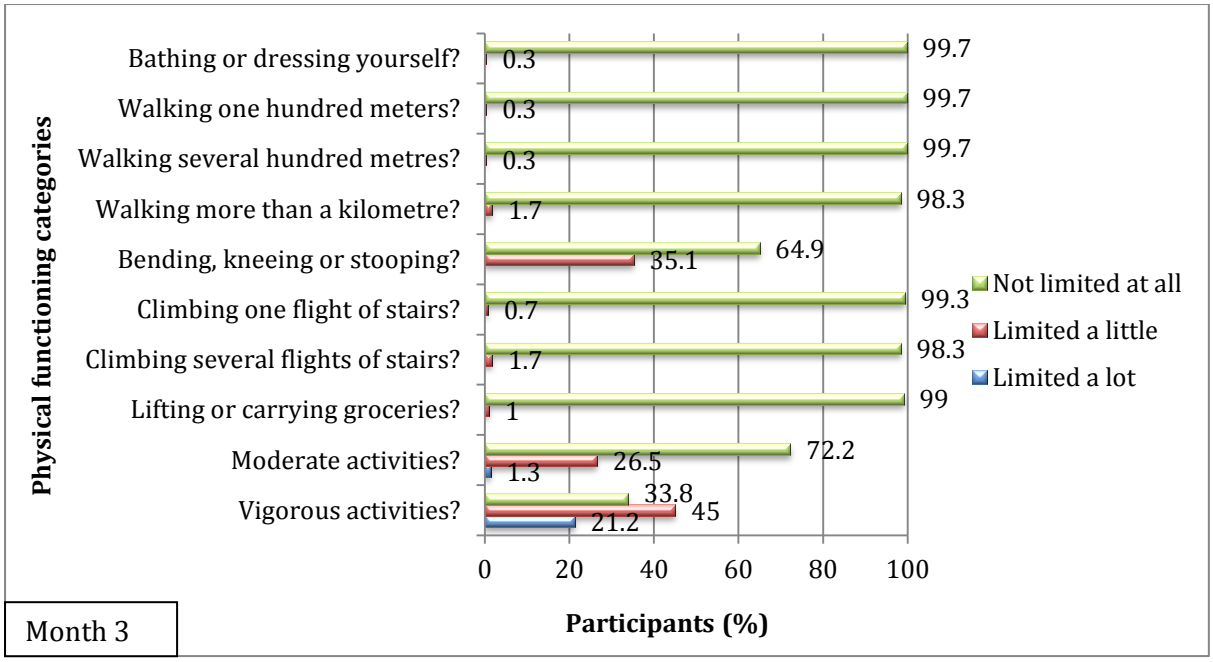


Figure 4.4 Physical functioning at month three (N=302)

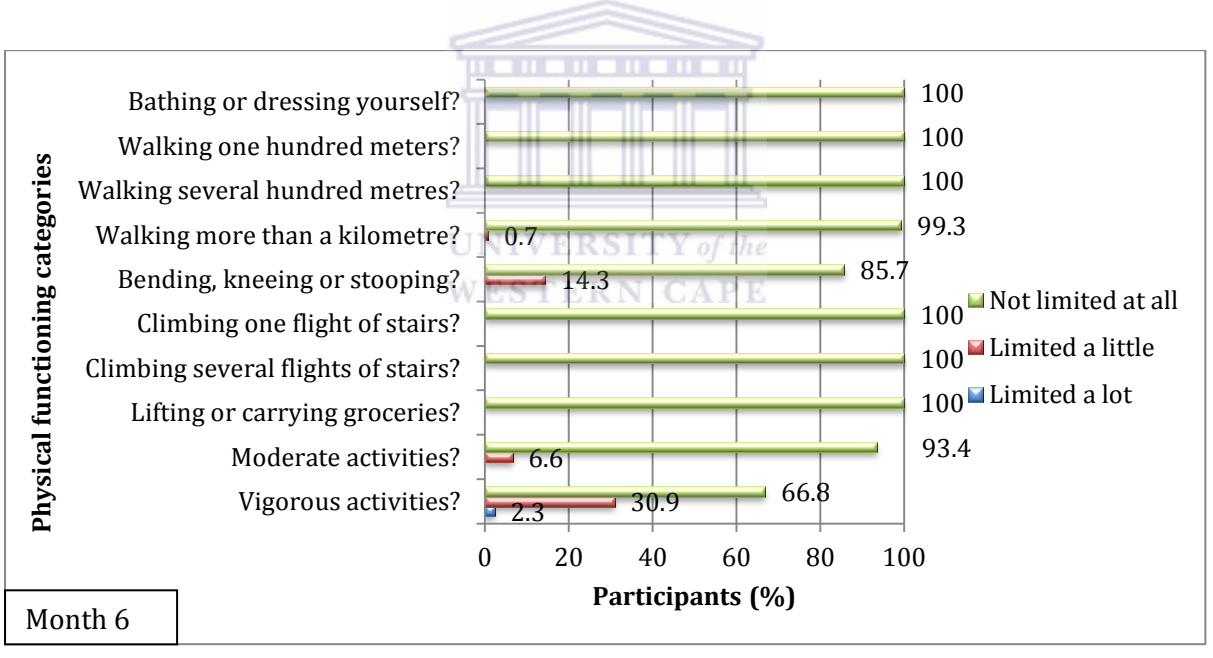


Figure 4.5 Physical functioning at month six (N=301)

Time had a significant effect on lower limb swelling (Question 12a) (t=2.448; p=0.014) and lower back pain (LBP) (Question 12b) (t=2.837; p=0.005) with the mean increasing for both over time. This indicated an improvement in lower-limb swelling and LBP over the six-month period. In terms of LBP, after three months, at least 54% (n=163) experienced LBP,

which decreased to 36.5% (n=110) after six months. The factors (explanatory variables) that influenced lower limb swelling and lower back pain of the participants are detailed below.

a) Factors influencing lower limb swelling and lower back pain post caesarean section delivery

There were no significant associations noted between the variables (HIV status, age, number of children, number of previous CSDs, and type of CSD) for lower limb swelling. The only significant variable for LBP, was at the 10% level between the age groups and their relationship with time (t=-1.755; p=0.079). The results show that the rate of increase of the ≥ 30-year-old age group mean from baseline to one month was less than that for the < 30-age groups. The rates of increase from one month to six months were approximately the same for the three age groups (Figure 4.6).

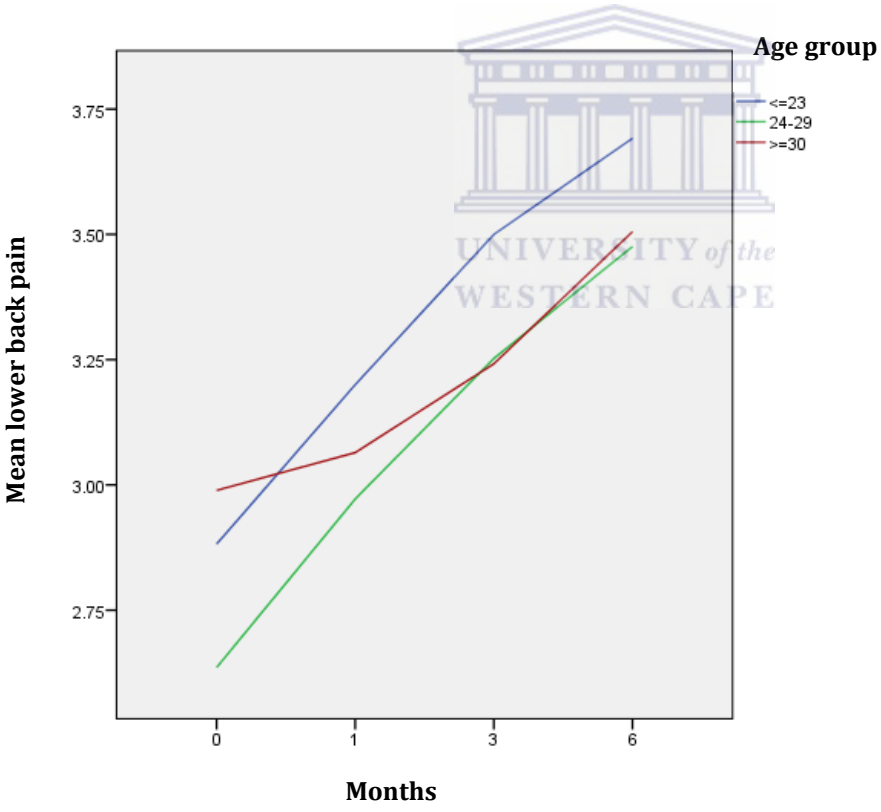


Figure 4.6: Lower back pain mean per age group over time

The open-ended Question 13 related to the most common problems verbalised by the participants, which they indicated were "the wound site becoming infected" (n=16) at month

one and "pain at the incision site when cold" at months three (n=16) and six (n=15) (Figure 4.7).

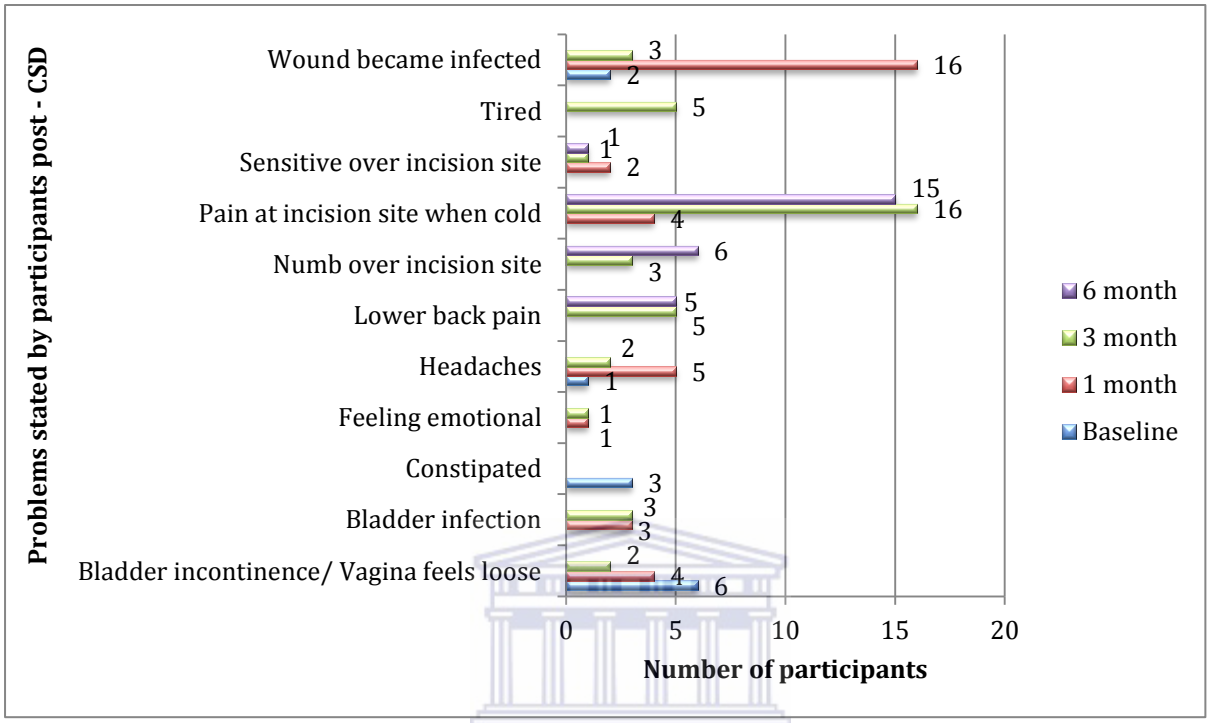


Figure 4.7: Problems experienced post-CSD over the six-month time period

In terms of bladder and bowel function, 66% (n=203) of participants experienced urinary incontinence (UI) immediately post-CSD and at the six-month time point 16% (n=48) still had a problem with bladder control. Participants who experienced UI immediately post-CSD were significantly (t=3.576; p=0.000) more likely to struggle with bladder control over the six months. Only two participants experienced urinary incontinence prior to surgery, which was a result of pregnancy, and did not affect the results.

4.2.3 Quality of life of HIV-infected and non-infected women post-caesarean section delivery

The QoL of the participants was determined by various scales within the SF 36 health survey part of the composite questionnaire (Questions one – eleven). These scales were summarised to calculate the physical health measure and the mental health measure of the participants.

The results showed that their QoL improved over the six-month time period (Table 4.4 and Table 4.5). However, there was a substantial difference between the scores, with lower scores in the physical health summary measure (Table 4.4) compared to the mental health summary measure (Table 4.5). This indicates that the physical health of the participant was more affected than their mental health post-CSD. Although the percentage at the six-month point is high, the results indicated that they still experienced some degree of limitation in terms of their physical health. These aspects will be explained in detail in the later sections.

Table 4.4: The physical health summary scores post-CSD

Time	Physical functioning	Physical Role	Bodily Pain		General Health		Physical health summary measure
	Q3	Q4	Q7	Q8	Q1	Q11	Total
Baseline	47.9%	60.5%	49.2%	53.4%	62%	81.8%	**59.1%**
1	88.9%	86.4%	78.2%	81.8%	66.4%	84.3%	**81%**
3	94.7%	93.6%	90%	94.4%	71.8%	85.9%	**88.4%**
6	98.1%	97.9%	97%	99%	74.8%	87.1%	**92.3%**
Average over 6 months	**82.2%**	**84.4%**	**78.3%**	**82%**	**68.6%**	**84.8%**	

Table 4.5: The mental health summary scores post-CSD

Time	Vitality/ Mental health	Social functioning		Emotional Role	Mental health summary measure
	Q9	Q6	Q10	Q5	Total
Baseline	66.3%	90.6%	94.6%	85.7%	**84.3%**
1	78.4%	99%	98%	97.9%	**93.3%**
3	84.2%	99.8%	99.2%	99.1%	**95.5%**
6	90.4%	100%	99.8%	99.8%	**97.5%**
Average over 6 months	**79.8%**	**97.2%**	**97.8%**	**95.6%**	

4.2.3.1 Physical health of HIV-infected and non-infected women post caesarean section delivery

As mentioned previously, in order to determine the impact of a CSD and establish which factors influenced the physical health of the participant, Questions 3 (physical functioning), 4 (physical role), 7, 8 (bodily pain), 1 and 11 (general health) of the questionnaire were independently evaluated. With regard to overall improvement, the results showed that time had a statistically significant effect on the variables, and as time increased, the physical health of the participants improved (Table 4.6). The factors influencing these results (explanatory variables) will be presented below.

Table 4.6: The effect of time on physical health

	Physical functioning	Physical Role	Bodily Pain		General Health	
	Q3	Q4	Q7	Q8	Q1	Q11
Time	11.347****	5.922****	6.992****	4.832****	2.395**	5.058****

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

a. Factors influencing physical health post caesarean section delivery

The results in Table 4.7 indicated that there was a statistically significant difference between the means of the physical health among the HIV-infected and non-infected participants. The results showed that the physical functioning (Question 3) mean of the HIV non-infected participants was greater than that of the HIV-infected participants at months one, three and six than at baseline (t=-4.190; p=0.000). The trend, indicating the difference between the two groups (HIV non-infected and HIV-infected) at each time point over the six-month period, showed that there was no significant difference (p=0.998) between the groups. The implication of this is that the means of both groups improved at the same rate over the six-month time period, even though there was an overall difference in the mean. The effects could be attributed to a small difference at baseline, month one, and month six, between the groups.

The mean of the physical role (Question 4) for the HIV non-infected participants was slightly smaller than for the HIV-infected participants at baseline, and then greater at months one, three and six, which was significant at the 5% level (t=-2.064; p=0.039). The mean of both the groups behaved identically over the six months, therefore there

was no significant difference (t=-0.628; p=0.053) between the two groups in terms of their interaction over time (Table 4.7).

Table 4.7: The effect of HIV status on physical health post-CSD

		Physical functioning	Physical Role	Bodily Pain		General Health	
HIV	***Time***	*Q3*	*Q4*	*Q7*	*Q8*	*Q1*	*Q11*
Non-infected	*Baseline*	14.45	11.96	2.91	2.65	3.25	16.63
	1	27.54	18.06	5	4.46	3.72	17.5
	3	29.14	19.35	5.68	4.87	4	17.78
	6	29.71	19.81	5.9	4.97	4.16	18.03
Infected	*Baseline*	14.31	12.21	3	2.68	2.94	16.1
	1	25.78	16.48	4.39	3.73	2.92	16.23
	3	27.69	18.08	5.11	4.56	3.18	16.57
	6	29.15	19.35	5.73	4.93	3.31	16.79
HIV	*GEE test*	-4.190**** (p=0.000)	-2.064** (p=0.039)	-2.901*** (p=0.004)	-4.797**** (p=0.000)	-6.782**** (p=0.000)	-2.392** (p=0.017)
Time*HIV		0.003 (p=0.998)	-0.628 (p=0.053)	-0.590 (p=0.555)	2.73*** (p=0.006)	-4.51**** (p=0.000)	-2.671*** (p=0.008)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

The mean for pain experienced at the operation site (Question 7) and the extent to which the pain interfered with normal activities (Question 8) [both variables are classified under bodily pain] showed that the HIV non-infected participants had a slightly smaller mean at baseline than the HIV-infected participants. There was a significant difference (t=-2.901; p=0.000) in the means between the groups in terms of amount of pain experienced at the operation site (Question 7), where the mean was greater for HIV non-infected participants. There was no significant difference in the interaction between the groups over time (t=-0.590; p=0.555). A significant difference (t=-4.797; p=0.000) was noted between the means of the groups for the extent to which the pain interfered with normal activities (Question 8). This difference (t=2.73; p=0.006) between the groups in their interaction with time over the six-months was maintained. This indicates that the groups improved at significantly different rates over the six-month time period.

For Questions 1 and 11 (general health) the results showed a significant difference between the groups for both questions. Question 1 was significant at the 0.1% level (t=-6.782, p-0.000) and Question 11 at the 5% level (t=-2.392, p=0.017), with the mean of the HIV non-infected group being greater. There was also a significant difference in the relationship between the groups (HIV non-infected and HIV-infected) with respect to their interaction over time for Question 1 (t=-4.51, p=0.000) and 11 (t=-2.671; p=0.008). The means of the HIV non-infected group were significantly greater than for the HIV-infected participants at months one, three and six than it was at baseline (Table 4.7).

Table 4.8 shows the effect of age on the various variables. The results for physical functioning (Question 3) demonstrated a significant difference (t=-2.349; p=0.019) between the groups, where the means for participants ≤ 23 years of age were slightly greater than the other age groups from baseline. There was a significant difference at the 10% level between the groups and their interaction with time (1.671, p=0.095). The slight difference was due to the mean score decreasing with age at baseline, and the remaining constant with age over the four time points.

Table 4.8: The effect of age on physical health post-CSD

		Physical functioning	Physical Role	Bodily Pain		General Health	
Age	***Time***	Q3	Q4	Q7	Q8	Q1	Q11
≤ 23	*Baseline*	14.73	11.65	3.03	2.71	3.19	15.87
	1	27.29	17.77	4.78	4.25	3.6	16.86
	3	28.78	19.12	5.49	4.75	3.79	17.22
	6	29.59	19.73	5.88	4.95	3.86	17.5
24-29	*Baseline*	14.31	12.8	2.9	2.71	2.99	16.54
	1	26.31	17.15	4.64	4.03	3.15	16.8
	3	28.19	18.54	5.36	4.65	3.47	17.21
	6	29.35	19.54	5.78	4.94	3.61	17.32
≥ 30	*Baseline*	14.04	11.77	2.94	2.57	3.11	16.74
	1	26.32	16.82	4.65	3.98	3.18	16.94
	3	28.26	18.44	5.34	4.75	3.51	17.09
	6	29.33	19.44	5.79	4.95	3.74	17.4
Age	GEE test	-2.349** (p=0.019)	-0.645 (p=0.519)	-0.517 (p=0.605)	-1.374 (p=0.169)	-1.86* (p=0.063)	2.576** (p=0.01)
Time*Age		1.671* (p=0.095)	0.068 (p=0.946)	-0.123 (p=0.902)	1.842* (p=0.065)	1.072 (p=0.284)	-4.093**** (p=0.000)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*
** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

There was no statistical difference (t=-0.645; p=0.519) between the means of the age groups for physical role (Question 4), with no significant difference noted between the different age groups (t=0.068; p=0.946) in their interaction with time. In addition, no significant difference was found for Question 7 of the bodily pain scale (t=-0.517; p=0.605) or in the trend between the different groups with time (t=-0.123; p=0.902). There was also no significant difference between the groups for Question 8 (t=-1.374; p=0.169), but there was a significant difference noted at the 10% level (t=1.842; p=0.065) between them over time. This was due to the mean for the ≤ 23 year old increasing steadily and being greater than the other age groups at months one and three, following which, there was a slight difference between the age groups (Table 4.8).

In terms of general health, Question 1 indicated that there was a significant difference at the 10% level (t=1.86; p=0.063) between the various age groups. The ≤ 23 years age group had the greatest mean scores, while the 24-29 year group had the lowest mean scores across the age categories. There was no difference between ≥ 30 years and 24-29

year means at one and three months, and there was no statistical difference noted in the trend between the groups over time (t=1.072, p=0.284). In Question 11 there was a small difference between the means of groups except at baseline, where the ≤ 23-year-old mean is smaller than that of the other two groups. This result was significant at the 5% level (t=2.576; p=0.01). There was a significant difference (t=-4.093; p=0.000) in the trend of the different age groups over time, where the mean increased less with age as time increased (Table 4.8).

The mean scores for the ≤2 children group appeared to be slightly greater than that for the ≥3 children group across all scales and time frames (Table 4.9). Only two questions were statistically significant, namely Question 4 (physical role) at a 10% level (t=1.697; p=0.09), and Question 11 in the general health scale at a 0.1% level (t=2.775; p=0.006) (Table 4.9).

Table 4.9: The effect of number of children on physical health post-CSD

		Physical functioning	Physical Role	Bodily Pain		General Health	
Number of Children	***Time***	Q3	Q4	Q7	Q8	Q1	Q11
≤1	*Baseline*	14.63	12.12	3.05	2.72	3.19	16.72
	1	27.16	17.75	4.83	4.26	3.49	17.29
	3	28.83	19.11	5.5	4.78	3.76	17.76
	6	29.62	19.74	5.86	4.95	3.88	17.87
≥2	*Baseline*	14.24	12.07	2.91	2.64	3.04	16.17
	1	26.39	17.01	4.62	4	3.23	16.63
	3	28.2	18.51	5.35	4.68	3.5	16.86
	6	29.33	19.49	5.8	4.94	3.66	17.16
Number of children	GEE test	1.53 (p=0.126)	1.697* (p=0.09)	1.441 (p=0.15)	1.619 (p=0.105)	1.036 (p=0.3)	2.775*** (p=0.006)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*

The results for incontinence indicated that the mean for participants who did not experience a problem with urinary incontinence following the procedure at baseline was greater over time and across the scales than for those who did. These results were statistically significant for the participants for the bodily pain scale (Question 7 and 8) and for general health (Question 1). The level of significance varied with a 5% level of

significance (t=2.224; p=0.026) for Question 7 and 1% level of significance (t=2.906, p=0.004; 2.652, p=0.008) for Question 8 and 1, respectively (Table 4.10).

Table 4.10: The effect of urinary incontinence post-CSD on physical health

		Physical functioning	Physical Role	Bodily Pain		General Health	
Incontinence	***Time***	**Q3**	**Q4**	**Q7**	**Q8**	**Q1**	**Q11**
Yes	*0*	14.25	12.07	2.85	2.6	2.98	16.3
	1	26.4	17.05	4.61	3.98	3.19	16.64
	3	28.25	18.56	5.33	4.69	3.46	17
	6	29.37	19.5	5.8	4.92	3.65	17.3
No	*0*	14.63	12.11	3.15	2.79	3.32	16.49
	1	27.16	17.68	4.86	4.32	3.56	17.29
	3	28.75	19.03	5.53	4.77	3.85	17.52
	6	29.54	19.72	5.86	4.99	3.89	17.62
Incontinence	GEE test	1.039 (p=0.299)	0.821 (p=0.412)	2.224** (p=0.026)	2.906*** (p=0.004)	2.652*** (p=0.008)	0.299 (p=0.765)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*

The mean for the participants who underwent an elective caesarean section appeared to be greater than for those who underwent an emergency caesarean section across the time frame. The results were statistically significant for all questions (Table 4.11) except for Question 8 t=-1.411; p=0.158) in the bodily pain scale. In terms of the number of CSD's and the impact they had on the patients' physical health, there was a slight difference in the mean, which was not significant (Table 4.11). The mean across the time frame for all the scales increased slightly as the number of CDSs a participant had increased in most for the time points (Table 4.11).

Table 4.11: The effect of the type and number of CSDs on physical health

		Physical functioning	Physical Role	Bodily Pain		General Health	
	Time	***Q3***	***Q4***	***Q7***	***Q8***	***Q1***	***Q11***
Type of CSD							
Elective	*Baseline*	14.72	12.22	2.97	2.65	3.23	16.8
	1	26.97	17.62	4.77	4.22	3.46	17.35
	3	28.74	18.98	5.52	4.79	3.78	17.59
	6	29.55	19.69	5.88	4.96	3.9	17.77
Emergency	*Baseline*	14.08	11.97	2.94	2.68	2.98	15.98
	1	26.39	16.96	4.63	3.98	3.19	16.44
	3	28.14	18.49	5.29	4.65	3.43	16.82
	6	29.32	19.48	5.76	4.94	3.59	17.09
	GEE test	-4.237**** (p=0.000)	-2.086** (p=0.037)	-1.722* (p=0.085)	-1.411 (p=0.158)	-5.003**** (p=0.000)	-2.938*** (p=0.003)
Number of CSDs							
≤1	*Baseline*	14.37	12.13	3.01	2.71	3.14	16.48
	1	26.64	17.19	4.67	4.06	3.31	16.88
	3	28.39	18.68	5.36	4.67	3.58	17.28
	6	29.45	19.55	5.79	4.94	3.72	17.52
2	*Baseline*	14.34	11.89	2.84	2.57	3.02	16.03
	1	26.74	17.37	4.75	4.14	3.33	16.76
	3	28.49	18.76	5.46	4.78	3.61	16.97
	6	29.39	19.59	5.84	4.94	3.78	17.16
3	*Baseline*	14.6	12.6	3	2.75	3.05	16.8
	1	26.5	17.6	4.65	4.2	3.35	17.15
	3	28.45	18.95	5.5	4.9	3.65	17.2
	6	29.45	19.8	5.95	5	3.75	17.5
	GEE test	0.917 (p=0.359)	1.63 (p=0.103)	0.444 (p=0.657)	1.329 (p=0.184)	-1.321 (p=0.187)	0.08 (p=0.936)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*
** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

4.2.3.2 Mental health of HIV-infected and non-infected women post caesarean section delivery

In order to determine the impact of a CSD on the mental health of the participant, Questions 9 (vitality/ mental health), 6, 10 (social functioning) and 5 (emotional role), which were scales within the composite questionnaire, were independently evaluated. In terms of overall improvement, the results showed that time had a significant effect on the variables (vitality/mental health, social functioning and emotional role), with the mental health of participants improving as the time passed (Table 4.12). The factors influencing these results (explanatory variables) will be presented below.

Table 4.12: The effect of time on mental health

	Vitality/ Mental health	Social functioning		Emotional Role
	Q9	Q6	Q10	Q5
Time	9.131**** p(0.000)	2.496** (p=0.013)	2.725*** (p=0.006)	3.028*** (p=0.002)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

a. Factors influencing mental health post caesarean section delivery

The results in Table 4.13 show that except for at baseline, there was a small difference regarding mental health and vitality (question nine) between the HIV non-infected and the HIV-infected participants, with the former mean being greater than the latter. This was significant at the 10% level (-1.638, p=0.101). However, the groups behaved significantly differently (-7.502; p=0.000) over time, with the HIV non-infected participants improving considerably therefore having greater mean scores at months one, three and six.

In terms of social functioning (Questions 6 and 10), the difference in scores between the HIV non-infected and HIV-infected group was minimal. The percentages for Question 6 for the HIV non-infected group were 97%, 99% and 100% for months one, three and six respectively, while the percentages for the HIV-infected group were 94%, 99% and 100% respectively for the same months. These results showed no significant difference (t=-0.371, p=0.711) between the two groups overall, and there was also no

variation in their interaction with time (t=0.556; p=0.578). For Question 10 on social functioning, these figures for months one, three and six were 94%, 96% and 99% for the HIV non-infected group, and 94%, 97% and 100% for the HIV-infected group. The overall results for Question 10 were significant at the 10% level (t=1.968; p=0.049) with the results between the groups over time showing a significance level of 5% (t=-2.073; p=0.038). The mean results for the emotional role (Question 5) showed no significant difference between groups (t=0.579; p=0.563) overall as well as in terms of the groups' interaction over time (t=-0.745; p=0.456 (Table 4.13).

Table 4.13: The effect of HIV status on mental health following a CSD

		Vitality/ Mental health	Social functioning		Emotional Role
HIV	***Time***	*Q9*	*Q6*	*Q10*	*Q5*
Non-infected	*Baseline*	29.51	4.56	4.66	12.73
	1	35.44	4.97	4.88	14.78
	3	37.95	4.98	4.95	14.89
	6	39.26	5	4.99	14.99
Infected	*Baseline*	30.14	4.5	4.81	12.99
	1	32.43	4.93	4.92	14.59
	3	34.18	4.99	4.97	14.84
	6	35.79	5	5	14.95
HIV status	*GEE test*	-1.638* (p=0.101)	-0.371 (p=0.711)	1.968* (p=0.049)	0.579 (p=0.563)
Time*HIV status		-7.502**** (p=0.000)	0.556 (p=0.578)	-2.073** (p=0.038)	-0.745 (p=0.456)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*
** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

Table 4.14 shows there was no significant difference noted between the various age groups and mental health. In terms of the interaction between the groups over time, only the mean for Question 9 was significant (-2.351, p=0,019). The results for the question show that the mean score increased linearly over age at baseline. At months one, three and six, the mean for the ≤ 23-year age group was greater than that for ≥ 24-year age groups.

Table 4.14: The effect of age on mental health post-CSD

		Vitality Mental health	Social functioning		Emotional Role
Age	***Time***	*Q9*	*Q6*	*Q10*	*Q5*
≤23	*Baseline*	29.5	4.53	4.7	12.67
	1	34.41	4.95	4.86	14.78
	3	36.9	4.97	4.94	14.89
	6	38.21	5	4.98	14.96
24-29	*Baseline*	29.69	4.56	4.78	13
	1	33.26	4.96	4.95	14.72
	3	35.44	5	4.98	14.89
	6	36.97	5	5	15
≥30	*Baseline*	30.35	4.49	4.72	12.92
	1	34.14	4.93	4.88	14.53
	3	35.82	4.99	4.96	14.81
	6	37.36	5	5	14.95
Age	*GEE test*	1.013 (p=0.311)	0.73 (p=0.465)	0.01 (p=0.992)	0.659 (p=051)
Time*Age		-2.351** (p=0.019)	-0.687 (p=0.492)	0.348 (p=0.728)	-0.748 (p=0.454)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*

The differences between groups with regard to the number of children, were minimal for the all the mental health scales across the time frame (Table 4.15). These results were only significant at a 10% level for Q6 in the social functioning scale for the overall result (t=1.876; p=0.016) and for the difference between the groups over time (t=-1.806; p=0.071).

Table 4.15: The effect of the number of children on mental health post-CSD

Number of children		Vitality/ Mental health	Social functioning		Emotional Role
	Time	Q9	Q6	Q10	Q5
≤1	*Baseline*	29.95	4.58	4.71	12.87
	1	34.36	4.96	4.87	14.78
	3	36.79	5	4.97	14.92
	6	38.26	5	4.99	14.97
≥2	*Baseline*	29.75	4.5	4.75	12.86
	1	33.7	4.94	4.92	14.63
	3	35.69	4.98	4.95	14.84
	6	37.14	5	4.99	14.97
Number of children	*GEE test*	1.476 (p=0.140)	1.876* (p=0.016)	0.911 (p=0.362)	1.381 (p=0.167)
Time*number of children		0.275 (p=0.783)	-1.806* (p=0.071)	-0.804 (p=0.421)	-1.181 (p=0.238)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*

The results for incontinence indicated that there were no significant differences between the mean for participants who did not experience a problem with urinary incontinence following the procedure and those who did (Table 4.16).

Table 4.16: The effect of incontinence on mental health post-CSD

Incontinence	*Time*	Vitality/Mental health	Social functioning		Emotional Role
		Q9	Q6	Q10	Q5
Yes	*Baseline*	29.64	4.49	4.74	12.9
	1	33.34	4.95	4.89	14.6
	3	35.62	4.98	4.94	14.82
	6	37.07	5	4.99	14.97
No	*Baseline*	30.17	4.61	4.71	12.79
	1	35.06	4.95	4.92	14.85
	3	36.95	4.99	4.98	14.95
	6	38.4	5	5	14.97
Incontinence	GEE test	1.433 (p=0.152)	1.07 (p=0.258)	0.827 (p=0.408)	0.551 (p=0.582)

Only Question 9 showed a statistically significant difference between the groups (t=-2.349; p=0.019) (Table 4.17). The mean results for elective CSD groups were greater than for the emergency group across the six-month time period. The results for the

effect the number of previous CSDs had on the participants' mental health showed that there was only a significant difference in terms of social functioning (Questions 6 and 10) between the groups (Table 4.17). The means increased linearly with the rise in number of caesareans at baseline. After month one, the increased rate was less, and after months three and six, the means were constant over the number of caesarean sections. The results between the groups regarding differences in their behaviour over time for this scale were significant at a 5% level for both Questions 6 and 10 (Table 4.17).

Table 4.17: The effect of type number of previous CSDs on mental health post-CSD

Type		Vitality /Mental health	Social functioning		Emotional Role
	Time	**Q9**	**Q6**	**Q10**	**Q5**
Elective	*Baseline*	30.62	4.59	4.77	13.1
	1	34.69	4.95	4.9	14.73
	3	36.8	4.99	4.94	14.87
	6	37.99	5	4.99	14.97
Emergency	*Baseline*	29.12	4.47	4.7	12.65
	1	33.27	4.95	4.9	14.64
	3	35.44	4.98	4.97	14.86
	6	37.12	5	4.99	14.97
	GEE test	-2.349** (p=0.019)	-0.443 (p=0.658)	0.673 (p=0.501)	-0.628 (p=0.530)
No. of CSD					
≤1	*Baseline*	29.92	4.5	4.7	12.9
	1	33.69	4.93	4.86	14.7
	3	35.9	4.98	4.95	14.84
	6	37.49	5	4.99	14.95
2	*Baseline*	29.33	4.55	4.78	12.59
	1	34.33	4.97	4.97	14.62
	3	36.22	5	4.97	14.93
	6	37.39	5	5	15
3	*Baseline*	31.1	4.75	4.85	13.75
	1	34.45	5	4.95	14.85
	3	37.1	5	4.95	14.85
	6	38.55	5	5	15
	GEE test	0.763 (p=0.445)	2.194** (p=0.028)	2.365** (p=0.018)	1.556 (p=0.12)
Time * No. of CSD		0.724 (p=0.469)	-2.249** (p=0.025)	-2.488** (p=0.013)	-1.459 (p=0.145)

***Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*

4.2.3.3 Reported health transition of HIV-infected and non-infected women post caesarean section delivery

The results show that time did not have a significant effect (t=-0.507; p=0.612) on the reported health transition (Question 2) of the participants. The factors (explanatory variables) that influenced the reported health transition are detailed below

a. Factors influencing reported health transition post caesarean section delivery

There was no significant difference noted between the HIV non-infected and HIV-infected group (t=0.15; p=0.881); the number of children the participants gave birth to (t=0.299; p=0.765) or the previous number of CSDs (t=1.028; p=0.304) for reported health transition (Question 2). The means for those respective variables increased for both groups over the six-month time period. There was a significant difference between the various age groups (t=-3.303; p=0.001) as a result of the ≤ 23 year age group having a greater mean over the entire six-month period when compared to the other age groups. The mean of the ≤ 23 year age group was greater than for the other groups at baseline and month one, which resulted in a significant difference between the relationships of the age groups in their interaction with time over the six-months (t=2.784; p=0.005). The results also showed that there was a statistically significant difference (t=3.336; p=0.001) between participants who did not experience a problem with urinary incontinence immediately following the procedure and those who did. The mean was higher across the time frame for participants who did not experience a problem with urinary incontinence at baseline. There was also a significant difference noted between the types of CSDs, with the means of the participants who underwent an elective CSD being statistically significantly higher than for the participants who underwent an emergency CSD (t=-3.062; p=0.002). The remaining variables were not significant for the reported health transition of participants.

4.2.3.4 The impact of pelvic floor complications in HIV-infected and non-infected women post caesarean section delivery

Participant who experienced UI post-CSD scored significantly lower (p=0.000) in terms of the impact of UI on their QoL over the six month time period than those who did not experience UI post-CSD. However, an improvement from months one to six in the bladder

section was noted. The scores were 84% in month one, 91.8% in month three and 96.3% in month six. In the bowel/rectum section, the results show that all participants had a score of 100% (maximum value = 28) over the three time points. The scores in the vagina/pelvis section were 99.9% in month one, and 100% in months three and six (maximum value of 28). This indicated that no adverse effect was caused to the bowel/rectum, vagina/pelvis by the CSD in this cohort of participants. The result showed that time did not have a significant impact (t=0.044; p=0.965) on the pelvic floor response of the participants, but this could be due to the high bowel/rectum and vagina/pelvis scores. The factors (explanatory variables) that influenced the impact of the CSD on the pelvic floor are presented below.

a) Factors influencing the impact of caesarean section delivery on the pelvic floor

There was a statistically significant difference noted between the HIV groups (p=0.003) with more HIV-infected women experiencing UI post-CSD. The mean of the HIV non-infected group was greater than the HIV-infected group, indicating that the QoL of HIV-infected women was more affected post-CSD (Table 4.18), with the difference between the groups being statistically significant (t=-5.477; p=0.000). However, the difference between the mean scores decreased over time (Figure 4.8). There was also a significant difference (t=4.012, p=0.000) between the means of the HIV groups and the interaction with time (Table 4.18). Except for two scores, all the bowel/rectum and vagina/pelvis scores had a maximum of 28, so there was no difference between the HIV non-infected and infected means for these variables (Table 4.18).

Table 4.18: Pelvic floor impact means for HIV-infected and non-infected participants

HIV	*Time*	Bladder/urine	Bowel/rectum	Vagina/pelvis
Non -infected	***1***	25.09	28	28
	3	26.56	28	28
	6	27.5	28	28
Infected	***1***	21.94	28	27.95
	3	24.85	28	27.99
	6	26.42	27.99	28
HIV	***GEE test***	-5.477**** p(0.000)		
Time* HIV		4.012**** p(0.000)		

**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

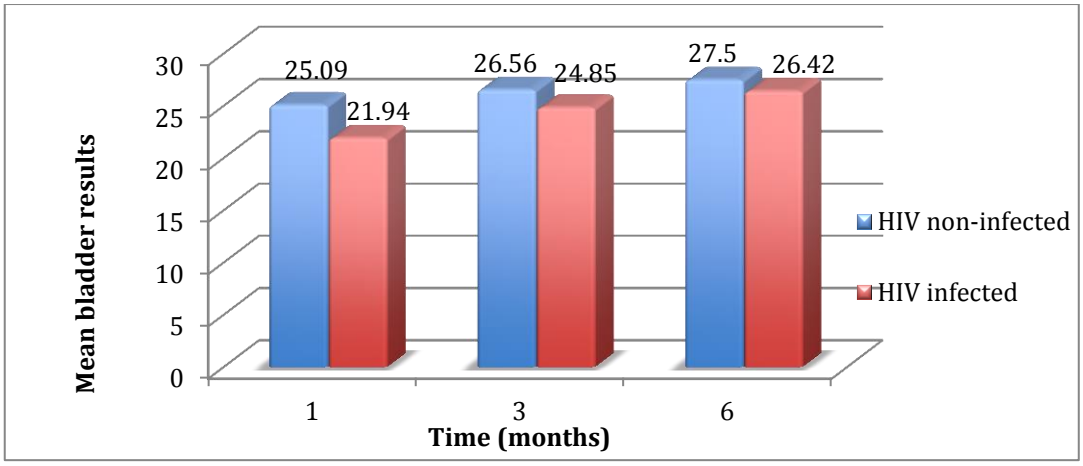


Figure 4.8: Mean bladder scores over time for HIV groups

There was no statistical difference (p=0.051) noted between age and UI post-CSD. Table 4.19 shows a statistically significant difference at the 10% level (t=-1.76; p=0.078) in the mean between the age groups, where mean for the bladder category decreased as age and the mean increased over time. There was no significant difference in the relationship between the groups over time (t=0.733; p=0.464)) when calculated per month. For bowel and vagina there are no differences between the means because almost all scores had the maximum value of 28.

Table 4.19: The impact of age on pelvic floor post-CSD

Age	*Time*	Bladder	Bowel	Vagina
≤ 23	***1***	24.84	28	28
	3	26.49	28	28
	6	27.59	28	28
24-29	***1***	23.18	28	27.93
	3	25.4	28	27.98
	6	26.72	27.99	28
≥ 30	***1***	22.33	28	28
	3	25.14	28	28
	6	26.51	28	28
Age	***GEE test***	-1.76* p(0.078)		
Time * age		0.733 p(0.464)		

**Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*

There was no statistical significance difference (p=0.273) noted between participants who previously had ≤1 child than those who previously had ≥2 children in terms of experiencing UI post-CSD. However, after adjusting the variables, a statistically significant difference (p=0.042) was noted between participants who previously bore ≤2 children than those who had ≥3 children, with the latter more likely to experience UI post-CSD. The results indicated that participants who previously had ≤ 2children had a statistically significant greater mean (t=3.576; p=0.000) than those who previously had ≥3 children for the bladder section of the questionnaire (Table 4.20). The difference in the interaction between the groups with time was significant (t=-2.424; p=0.015). The mean difference between the groups decreased as time increased. For bowel/rectum and vagina/pelvis scores, there were no differences between means because almost all scores had the maximum value of 28.

Table 4.20: The impact of number of children on pelvic floor

Number of Children	*Time*	Bladder	Bowel	Vagina
≤2	*1*	25.04	28	28
	3	26.52	28	28
	6	27.3	28	28
≥3	*1*	22.69	28	27.97
	3	25.28	28	27.99
	6	26.78	27.99	28
Number of children	*GEE test*	3.576**** p(0.000)		
Time * number of children		-2.424** p(0.015)		

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

There was a statistically significant difference (p=0.001) between the operative groups with women who had an emergency CSD experiencing UI and those who did not. The mean for the participants who underwent an elective caesarean section was also significantly greater (t=-5.624; p=0.000) than for those who underwent an emergency caesarean section (Table 4.21). For bowel/rectum and vagina/pelvis scores there were no differences between means, and almost all scores had the maximum value of 28. The results indicated that the mean for the participants who had three CSDs was slightly greater than for the other two groups but the differences between the means

were not statistically significant (t=0.673; p=0.501) (Table 4.21). For bowel/rectum and vagina/pelvis scores there were no difference between the means, as all scores had the maximum value of 28.

Table 4.21: The impact of the type and number of CSDs on the pelvic floor

Type of CSD	*Time*	Bladder	Bowel	Vagina
Elective	***1***	24.69	28	28
	3	26.62	28	28
	6	27.54	28	28
Emergency	***1***	22.48	28	27.96
	3	24.91	28	27.99
	6	26.46	27.99	28
	GEE test	-5.624**** p(0.000)		
Number of CSD				
≤1	***1***	23.54	28	27.96
	3	25.71	28	27.99
	6	26.73	28	28
2	***1***	23.4	28	28
	3	25.69	28	28
	6	27.33	27.99	28
3	***1***	23.8	28	28
	3	25.85	28	28
	6	27.5	28	28
	GEE test	0.673 p(0.501)		

**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

4.2.4 Health-seeking behaviour of HIV-infected and non-infected women post caesarean section delivery

None of the participants who had postoperative complications sought medical attention or advice (Figure 4.9), with the majority stating that their reasons for not seeking advice were that they would be given analgesics at baseline (n=218; 70%), month one (n=154; 50%), month three (n=92; 31%) and month six (n=25; 8%) (Figure 4.10).

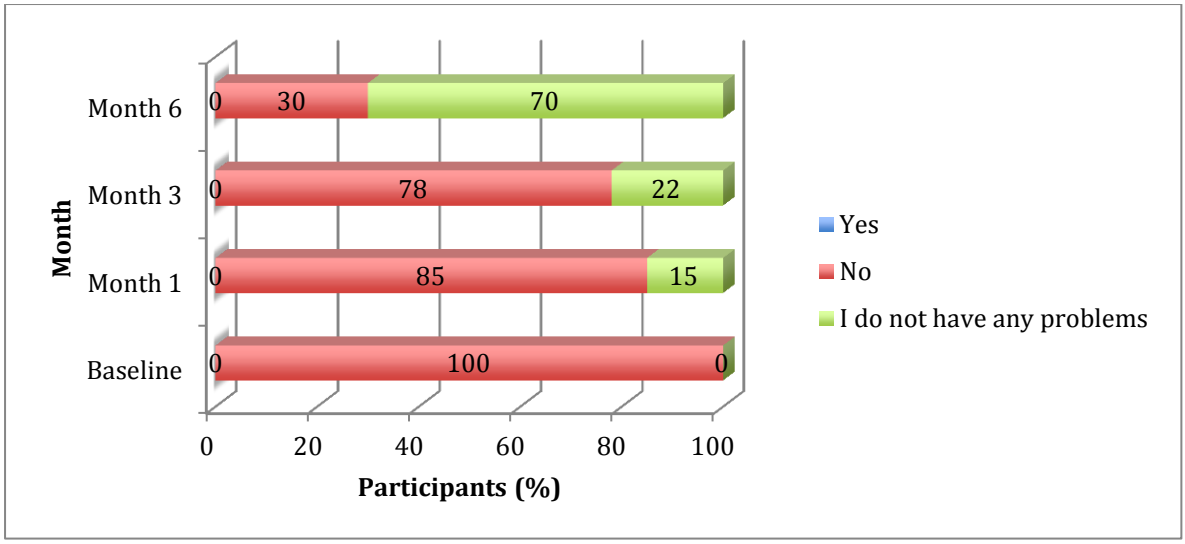


Figure 4.9: Percentage seeking medical attention for postoperative complications

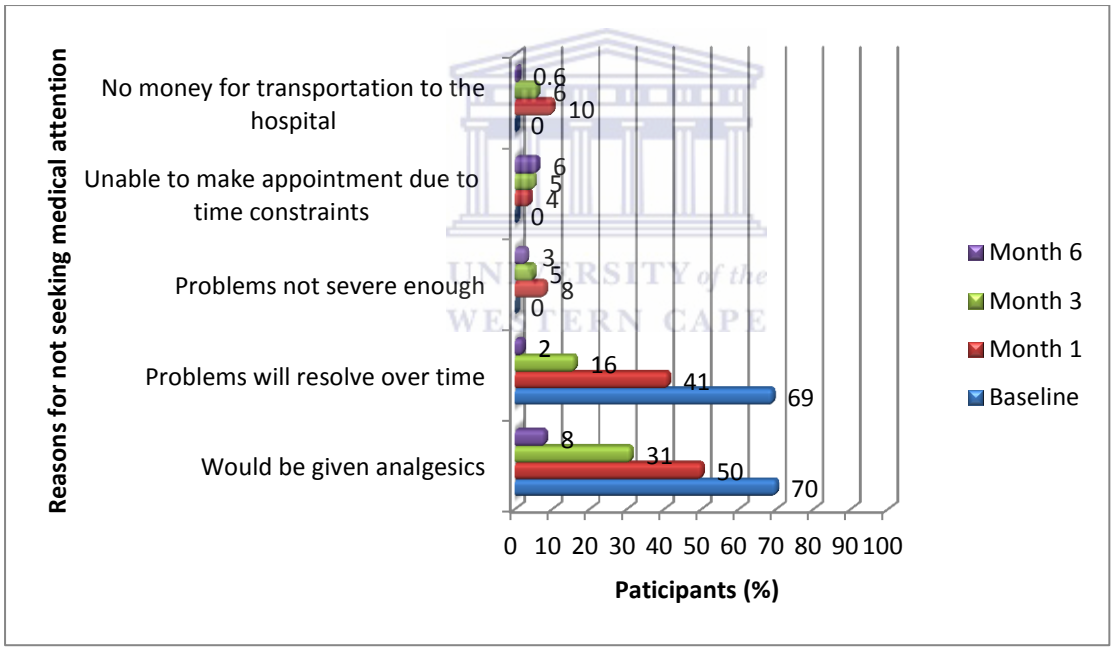


Figure 4.10: Reasons for not seeking medical attention for postoperative complications

4.3 DISCUSSION

The purpose of this phase of the study was to determine the long-term complications and the QoL of women post-CSD. The physical and mental health of the participants was analysed according to various scales, the summary showing that the former was more affected than the latter. There were complications that predisposed women to a longer recovery time and

negatively impacted on their QoL despite a general improvement in health over time. The factors that may have predisposed women to complications were also identified. The main findings at the final (six-month) time point from the socio-demographic section, the long-term complications, the quality of life and the health-seeking behaviour post-CSD are discussed below.

4.3.1 Socio-demographic profile of HIV-infected and HIV non-infected women post caesarean section delivery

The results from the socio-demographic section of the study showed that HIV-infected women were more likely to be unmarried (p=0.000) and would have given birth to more children (p=0.027) than the HIV non-infected women. The results obtained were similar to the Human Sciences Research Council (HSRC) survey, which showed that married people were less likely to be HIV positive (Shisana et al., 2014). Research has noted low marriage levels among the African population (Setswe & Zuma, 2013), which is reportedly due to the cost of *lobola* and marriage (Hunter, 2006). Cohabiting has therefore become a common practice (Hunter, 2006), with recent literature indicating that unmarried couples living together (or couples in a steady relationship) were more at risk of contracting HIV than married or single people (Shisana et al., 2014). Although exploring the exact relationship status of the participants was not within the scope of the study, this information highlights a possible reason for the high HIV prevalence among the currently unmarried study participants.

Heterosexual intercourse remains the main mode of HIV transmission in sub-Saharan Africa, with one of the reasons for the high prevalence rates among women being that they experience difficulty in negotiating safe sex options with their partners (Ndinda, Uzodike, Chimbwete, Pool, 2007) such as condom use (Pitpitan et al., 2012). Furthermore, participants in this study came from public hospitals, which usually cater for the lower-income group in South Africa, with the country experiencing a close association between poverty (Shisana, Rice, Zungu & Zuma, 2010), gender inequality (Romero et al., 2006), gender-based violence, and HIV transmission (Kaufman, Shefer, Crawford, Simbayi, Kalichman, 2008; Dunkle et al., 2004). This correlated with the other finding where it was noted that HIV-infected women gave birth to more children despite there being no age difference between the two groups (p=0.069). These results highlight the fact that the HIV-

infected participants in this study were not using condoms or were unable to negotiate condom usage with their partners, which could have resulted in their contracting the virus and falling pregnant. This reinforces the importance of condom negotiation, as it serves the dual purpose of protecting against unwanted pregnancy and contracting HIV (Seutlwadi & Peltzer, 2013). Despite this not being a focal point of this study, these results are important as HIV affects everyone in South Africa, not only the infected population. Although there are numerous prevention strategies in place in South Africa (SA Department of Health, 2011a), the results of this study suggest that there is still a dire need for gender-empowerment programmes.

4.3.2 Long-term complications of HIV-infected and HIV non-infected women post caesarean section delivery

The long-term complications of a CSD tend to be minimal with the focus mainly on short-term caesarean morbidity (Silver, 2010). However, with the rate of CSD on the rise and more women requesting the procedure, it is important to understand the potential long-term complications. The results of this study show that there were a number of participants who could not perform physical activities such as vigorous activities (33.2%; n=100), bending, kneeling or stooping (14.3%; n=43) at the six-month time point. Predisposing factors from the results of the current study were being HIV-infected (p=0.000), ≥ 23 years old (p=0.019) and having undergone an emergency CSD (p=0.000). Recent international research in this area has shown that physical health problems can persist for 18 months postpartum (Woolhouse, Perlen, Gartlans, Brown & Hons, 2012) and patients post-CSD have poorer physical health (Kealy, Small, & Liamputtong, 2010; Torkan et al., 2009), but the studies did not specify the areas affected.

Advice given to women post-CSD by the nursing staff, doctor or physiotherapist, is usually to avoid any heavy lifting, driving a vehicle, and sexual intercourse for 4 – 6 weeks (Kealy et al., 2010; NICE, 2012). However, the study by Jansen et al., (2007) found that women who underwent an elective CSD needed six weeks to reach normal non-pregnant values, whereas patients who underwent an emergency CSD needed more than six weeks. Most women assume the majority of caring work for their family (England, 2005), and in this study, where the majority of the women were unmarried, they may be the only caregiver for the child and be forced to continue normal activities despite the operation. Placed in these situations,

women might find it difficult to adhere to the post-surgical advice (assuming it was given to start off with) (Kealy et al., 2010). Anecdotal information received during data collection by the researcher from women who "just needed to talk" without prompting from the researcher, showed that most women had to carry 5 L buckets of water from taps located 1-2 km from their residence from the one-month follow-up time point. The lack of rest and continuation of normal activities could have disrupted the healing process, and could be part of the reason why some women were still struggling with physical activities at the six-month time point. These results highlight the need for physiotherapists to tailor their advice to suit the patient and 'real life' situations, an aspect for which training is received at undergraduate level. The participants in this study had to collect water and perform household chores owing to the lack of support, therefore the ergonomic and kinetic handling advice given to the patient needs to be specific in order to improve their physical functioning, which would improve their QoL postpartum.

Being HIV-infected was one of the predisposing factors for pain or being unable to perform physical activities post-CSD. The immunosuppressed state of the participants possibly resulted in delayed healing of their wound (Young & McNaught, 2011) and was probably due to their viral load, which was beyond the scope of the study. Patients older than 23 years of age were also at risk. While there is minimal research on the effect of a CS on older women (Hannah, 2004), degeneration of the spine is part of aging (Adams & Roughley, 2006), while pregnancy also exerts a great deal of stress on the musculature of the body (Haslam, 2004), which could have been the reason for age being a contributing factor. The last predisposing factor was having undergone an emergency CSD. This correlated with research that showed that these patients experienced labour and the operative procedure, which leads to lower HRQoL scores (Jansen et al., 2007). The results indicated that the type of advice given to women post-CSD therefore has to change to accommodate the less-than-perfect scenario (Kealy et al., 2010).

Literature has noted that a significant number of women who undergo a CSD experience chronic pain (Silver, 2010), which has recently been receiving interest in obstetrics (Nikolajsen, Sørensen, Jensen & Kehlet, 2004), with few studies pre-2010 assessing this condition (Silver, 2010). The results from the present study showed that pain at the operation site post-CSD was reported by 55 participants (18.3%) six months following the procedure. Nikolajsen et al. (2004) found similar results, in which 18.6% (n = 44) of their participants

reported pain for longer than three months. The participants in the present study even replied to the open-ended question that they experienced pain at the incision site (5%, n=15). Pain at the incision site was statistically significant among the HIV-infected women (p=0.004). Literature has suggested that the pain may be a result of nerve entrapment, caesarean scar defect, or pelvic adhesions (Silver, 2010; Nikolajsen et al., 2004). In the case of HIV-infected women, the delayed healing as a result of the immunosuppression could also be a contributory factor (Young & McNaught, 2011). A recent study by Karakaya et al. (2012) showed that physiotherapy techniques such as TENS and connective tissue manipulation reduced postoperative incisional pain. Although their study was not longitudinal, it did indicate that by reducing and treating pain postoperatively, physiotherapists may prevent it from becoming a chronic problem.

Physiotherapists are known for being able to effectively treat patients with LBP. This study found that 110 (36.5%) participants still had some degree of LBP at the final time point, although there were no predisposing factors at the 5% significance level. This figure, albeit high, is less than a study by Woolhouse et al. (2012), where the researchers found 54.7% of women post-CSD complained of LBP, which was higher than the women who had normal vaginal deliveries (Woolhouse et al., 2012). A possible reason for this is that part of the exclusion criteria was chronic lower back pain, so the results might have been higher if that group of patients were included. Chronic back pain patients were deliberately excluded to provide the researcher with a clearer picture of the relationship between CSD and LBP. The results of this study therefore suggest that there is a high percentage of women who require LBP treatment either due to pregnancy, the CS procedure or both postpartum. The high prevalence of LBP could also have been a contributory factor as to why some participants were unable to perform vigorous activities (discussed earlier in the chapter).

The results of this study correlated with various other studies, which also stated that a CS does not protect against UI (Altman et al., 2007; Groutz et al., 2004). In this study, 48 (16%) participants still struggled with urinary incontinence at the final time point. The results showed that being infected with HIV (p=0.003), having more than two children (p=0.042) and undergoing an emergency CSD (p=0.001) were predisposing factors. The findings are similar to other studies that have also found that patients who had undergone an emergency caesarean section (Chin et al., 2006) and were multiparous (Chin et al., 2006; Rortveit, Hannestad & Daltveit, 2001) were more at risk of developing UI. International (Panburana et

al., 2003) and local (Moodliar et al., 2007) research into the complications of HIV-infected women noted that the complication rate was the same for HIV non-infected and infected women post-CSD, provided the viral load was low among the HIV-infected patients.

The reason why this study found that being infected with HIV was a predisposing factor for UI, could be that the viral load was high in the participants even though they were fit enough for surgery. Previous studies (Moodliar et al., 2007; Panburana et al., 2003) also did not specifically look for UI among the women. More research is therefore needed in this area to determine if being HIV-infected is really a predisposing factor for UI. This study found that a high number of women (66%, n=203) noted experiencing UI immediately postpartum. These results are just over 3.5 times higher than the study by Chin et al., (2006). At the six-month time point, the results (16%, n=48) were also slightly higher when compared to another study where the prevalence rate was 11.9% six months postpartum (Woolhouse et al., 2012). Stress urinary incontinence is the most common form experienced by women post-CSD and postpartum in general (Chin et al., 2006; Groutz et al., 2004; Rortveit et al., 2003). The figures from the present study highlight the need for postnatal pelvic floor classes for women. Women will often not seek help for fear of embarrassment (Luber, 2004), and in a South African context, they might not know they can get help for UI. Physiotherapists play an important role in terms of stress UI because conservative management is the first option (NICE, 2013), and usually includes pelvic floor re-training and behavioural therapy (NICE, 2013; Rovner & Wein, 2004).

The long-term complications found were problems with physical functioning (vigorous activities, bending, kneeling and stooping), pain at the operation site, lower-back pain, and urinary incontinence. Physiotherapists are trained to prevent these complications, and the results above reinforce the need for their intervention in women post-CSD. As health care professionals, they require a complete picture of the patient for holistic management. As Roger Dawson (n.d) once stated; “It's not how long life is but the quality of our life that is important.” The QoL of a patient thus becomes key to determine the impact of complications on an individual’s life at home and at work.

4.3.3 Quality of life among HIV-infected and HIV non-infected women post caesarean section delivery

The results from this study showed that despite the QoL improving over the various time-points, participants still experienced physical health problems, including UI six-months postpartum, which negatively impacted on their QoL. The results also suggest that the physical health of the participants was more affected than the mental health, with HIV-infected women scoring significantly lower in all the subsets of the physical health category. A woman's body undergoes endocrine changes following childbirth (Huang et al., 2012), and coupled with a compromised immune system, this could be the reason that HIV-infected women scored lower. The public health care system is also mainly used by South Africa's lower income group, which implies that social determinants may also be influencing factors on the patients postnatal QoL, specifically the physical aspect. The results were similar to other findings, which demonstrated that women had better improvements in the mental health section of the SF36 health questionnaire post-CSD (Torkan et al., 2009; Jansen et al., 2007), but the participants in these studies were HIV non-infected. An interesting result from the mental health vitality and mental health sub-section, was that women who underwent an emergency CSD scored lower than those who underwent an elective CSD. This could be due to the women not being mentally prepared to undergo the procedure, which also requires a longer healing time than an elective CSD (Jansen et al., (2007) and a normal vaginal delivery (Torkan, 2009). A similar study by Larrabee, Monga, Erikse and Helfgott (1996) in Huston, Texas comparing HIV-infected and non-infected women, showed worse social and cognitive functioning among HIV-infected women. The authors stated that the decreased societal functioning might be due to cultural and social reactions to the virus (Larrabee et al., 1996). Contrary to that study (Larrabee et al., 1996) the present research found no significant difference in the social functioning between the HIV-infected and non-infected participants. Despite the stigma associated with HIV still being rife in South Africa (Gilbert & Walker, 2010), a decrease has been noted (Mall, Middelkoop, Mark, Wood & Bekker, 2013). The improved social interaction could be due to an increase in knowledge about the virus resulting from South Africans being more exposed to and therefore socially aware of HIV, due to the high prevalence rates (Mall et al., 2013).

Urinary incontinence is not viewed as a life-threating disease, which could be the reason for research into the effects of UI on the QoL of women only commencing about 15 years ago (L. M. Segedi, D. Segedi & llic, 2011). The reality is that UI has a serious psychological impact on women, and leads to social seclusion and economic burden (Segedi et al., 2011; Herzog, Diokno, Brown, Fultz & Goldstein, 1994). The QoL of participants who complained of UI post-CSD was negatively affected, which is similar to another study in this area (Handa et al., 2007). This coupled with other postoperative complications and a baby, can be extremely stressful for a woman postpartum, especially if she does not understand what is happening to her body. This study also found that the 'at risk group' for developing UI, namely HIV-infected women, women who had three or more children, and those who had had an emergency caesarean section, were also more impaired in terms of the QoL than their comparative groups. This could be because HIV-infected women who are already socially excluded by social stigma (Gilbert & Walker, 2010) now have to cope with UI, which can be embarrassing. An increase in parity has been associated with a reduced QoL (MacLennan, Taylor, Wilson & Wilson, 2000), which was also confirmed by results in this study. Reasons for this are scarce, but it could result from the increased demand already placed on women with more children who now have to also cope with UI. Women who undergo an emergency caesarean section take a longer time to heal (Jansen et al., 2007) that results in a reduced QoL for a longer period, and experiencing UI compounds this problem. However, UI can be avoided or corrected, because effective treatments are available (Handa et al., 2007; Mantle et al, 2004). Health care professionals caring for postpartum patients should therefore screen them in order to identify UI at follow-up visits (Handa et al., 2007).

The reported health transition scale (Q2) yielded interesting results where participants ≥24 years old (p=0.001), participants experiencing UI immediately post-CSD (p=0.001), and participants who underwent an emergency CSD (p=0.002) scored the lowest postpartum, implying that this group of participants had a poorer view of their health postpartum. For most women, the transition into motherhood is difficult, with little to no postpartum support provided (Nelson, 2003). In older women, the delivery may be viewed as a life stressor and an added responsibility to that person. Furthermore a difficult postpartum recovery may disrupt the transition process (Nelson, 2003), which could be the reason for women with UI and those who underwent an emergency CSD scoring lower. Ongoing postpartum support and advice are thus an important part of the management plan for women as they facilitate the transition process, which will lead to a significant improvement in the wellbeing of the

mother and the baby (Shaw, Levitt, Wong & Kaczorowski, 2006; Karl, Limbo & Ricker, 1998). Common postnatal morbidities are less understood as most of the studies focus on serious morbidities (MacArthur, 1999) and prevention of maternal mortality. The long-term impact of these morbidities needs to be addressed, as it does not only affect the mother, but spills over on to caring for her family. While this fact has been highlighted in the literature (Torkan et al., 2009), the physical health of women postpartum is still a neglected area in research and practice (Cheng & Li, 2008). The results from this study suggest that the quality of life of women may be negatively affected by the caesarean section procedure.

4.3.4 The health-seeking behaviour of HIV-infected and non-infected women post caesarean section delivery

An interesting finding of the study was that none of the women sought postoperative medical attention to address either their concerns or complications. While the reasons stated by participants varied, it can be summarised as a lack of knowledge on the patients' part concerning postoperative complications and their consequences, as well as the inaccessibility of health services. Similar results were found by Ugboaja, Berthrand, Igwegbe and OBI-Nwosu (2013) in a study conducted in Nigeria. The authors found that poor knowledge and inaccessibility were major barriers to postnatal care (Ugboaja et al., 2013). Another study found that women did not seek medical attention because they considered it to be a normal part of the postpartum process and role demands (Declercq, Sakala, Corry, Applebaum & Risher, 2002), which could also be attributed to a lack of knowledge. The literature is only starting to highlight the common postpartum morbidities, with more research being required in this area (Cheng & Li, 2008) as well as a greater effort to identify ‘at risk’ patients. The lack of knowledge in the participants and the inaccessibility to health care may also be suggestive of poor communication on the health professionals’ part. Access to health care is a problem in South Africa, but if patients are educated on potential problems and how to address them, they can seek medical attention from their local clinic rather than waiting for their next hospital visit, or assuming that only the doctors at their respective hospital can assist them. Moreover, considering the paucity of research in this area, the attending health care professional may also be unaware of the potential postnatal complications to educate the patient on these issues. This suggests that prior to educating and informing patients, the health care professionals need to be educated and informed about the postpartum complications.

4.4 CONCLUSION

The findings highlight that there are long-term complications which may negativley affect the QoL of women post CSD. The long-term complications identified, namely, poor physical functioning, pain at the operative site, LBP, and urinary incontinence, can be either prevented or treated by physiotherapists with adequate screening and montoring. An interesting finding which was not an objective of this study but needs to be explored, is the need for gender empowerment programmes in South Africa to combat HIV transmission. Physiotherapists have the ability to treat and in some cases prevent all the complications found thus far, but in order for this to occur, they need to be made aware of the potential complications, and be guided to ensure that the most effective treatment is rendered. This knowledge also needs to be conveyed to patients, to improve their health and prevent complications from becoming chronic. The information received from this study will assist the researcher not only in providing evidence for guideline development in physiotherapy, but also adds to the literature in this area, which is desperately needed.

In terms of fitting into the biospychosocial model, different areas have been highlighted in this chapter; the biological aspects (physical) negatively affecting the patient QoL have been explored along with the psychological (emotional) ones. In terms of patients post-CSD, the biological aspect is more affected postoperatively, which negatively impacts on the patients' QoL and needs to be addressed. Social aspects are a lack of education concerning the postoperative complications, and inaccessibility to medical attention. However these issues can be resolved with proper communication between the health care professional and the patient.

The next chapter will determine the long-term complications and QoL of HIV-infected and HIV non-infected women post hysterectomy. The complications highlighted in this chapter will be combined with the next chapter and provide a platform for the researcher to evaluate whether physiotherapists are addressing the correct problems in these patients, which will be addressed in Phase 2 of the research. The results will also be combined with the results from Phase 2 to be used as key words during the systematic review (Phase 3).

CHAPTER 5. THE LONG-TERM COMPLICATIONS AND QUALITY OF LIFE ACCORDING TO WOMEN FOLLOWING A HYSTERECTOMY

5.1 INTRODUCTION

This chapter addresses Objective 2 of Phase 1, and presents the results describing the long-term complications and quality of life of women post hysterectomy. The chapter will follow a similar format to the previous chapter, with the outline as follows: introduction, results, discussion and conclusion.

5.2 RESULTS

This section is sub-divided into the following: socio-demographic and medical profile of participants; long-term complications specific to physiotherapy experienced by HIV-infected and non-infected women post hysterectomy; the quality of life of HIV-infected and non-infected women post hysterectomy; and the health-seeking behaviour of HIV-infected and non-infected women post hysterectomy.

5.2.1 Socio-demographic and medical profile of participants post hysterectomy

A total of 101 patients [HIV-infected n=50, HIV non-infected n = 51] were evaluated at baseline level. The overall attrition rate was six participants (5.9%). Figure 5.1 below indicates the stages of drop out and possible reasons.

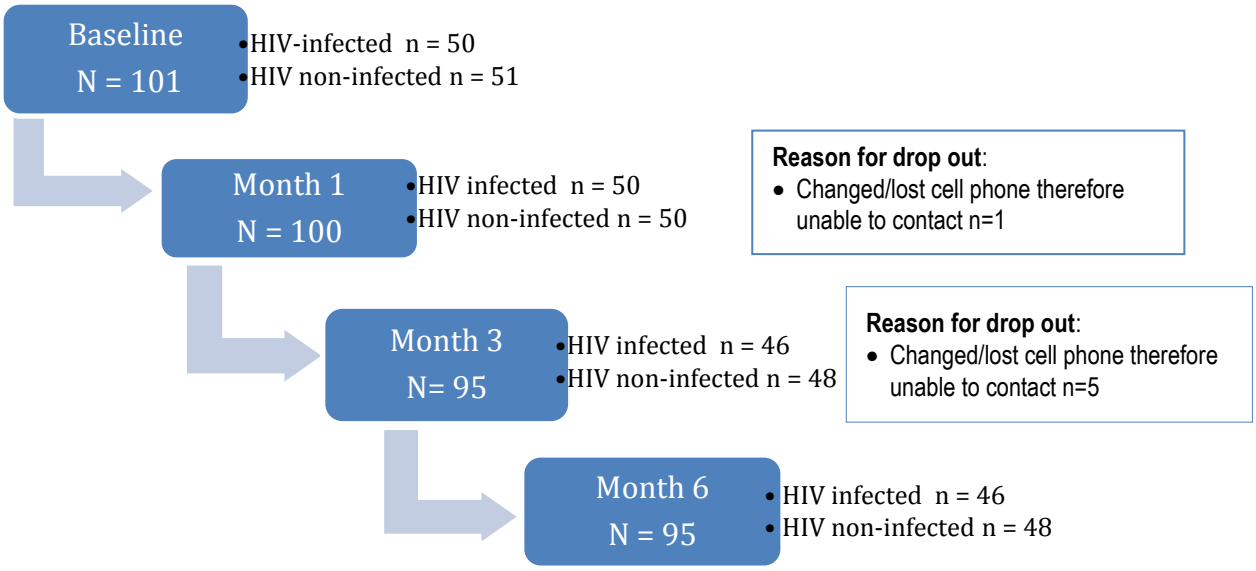


Figure 5.1: Attrition rate of hysterectomy participants over six months

The ages of the participants ranged from 24 to 81 years with a mean age of 47.19 years (SD ± 10.38). There was a significant difference (p=0.000) between the mean age of the HIV-infected (mean age = 42.04; SD ± 6.06) and the HIV non-infected group (mean age = 52.24; SD ± 11.26) with the former being younger. With regard to groups, 68.3%(n=69) were African, 27.7% (n=27) were Indian, 3% (n=3) were Coloured (mixed ancestry) and 2% (n=2) were White.

Of the 101 participants, 45.5% (n=46) had never been married, while 44.5% (n=45) were married. The remaining 10% (n=10) of participants were separated (3%), widowed (5%) or divorced (2%). A significant statistical difference was noted between the marital status of the HIV infected and HIV non-infected participants (p = 0.000), with more HIV non-infected participants being married (n=35) or previously married (n=8). The mean number of children of the total group was 3.55 (SD ± 1.52). There was no significant association (p = 0.149) between the number of children and the HIV status of the participants. The demographic data are represented in Table 5.1.

Table 5.1: Socio-demographic profile of the hysterectomy participants

Variables	HIV non-infected n=51	HIV infected n=50	Total N =101 (%)
Age			Mean = 47.19 SD ±10.38
Race			
African	21	48	69 (68.3%)
Coloured (mixed ancestry)	2	1	3 (3%)
Indian	26	1	27 (27.7%)
White	2	0	2 (2%)
Marital status			
Never been married	8	38	46 (45.5%)
Married/co-habiting	35	10	45 (44.5%)
Previously Married	8	2	10 (9.9%)
Number of children			
0	3	4	7 (6.9%)
1	5	12	17 (16.8)
2	18	13	31 (30.6%)
3	10	13	23 (22.7%)
4	7	4	11 (10.8%)
5	4	2	6 (5.9%)
Other	4	2	6 (5.9%)

The majority (n = 82; 81.2%) of participants had undergone a total hysterectomy (Figure 5.2).

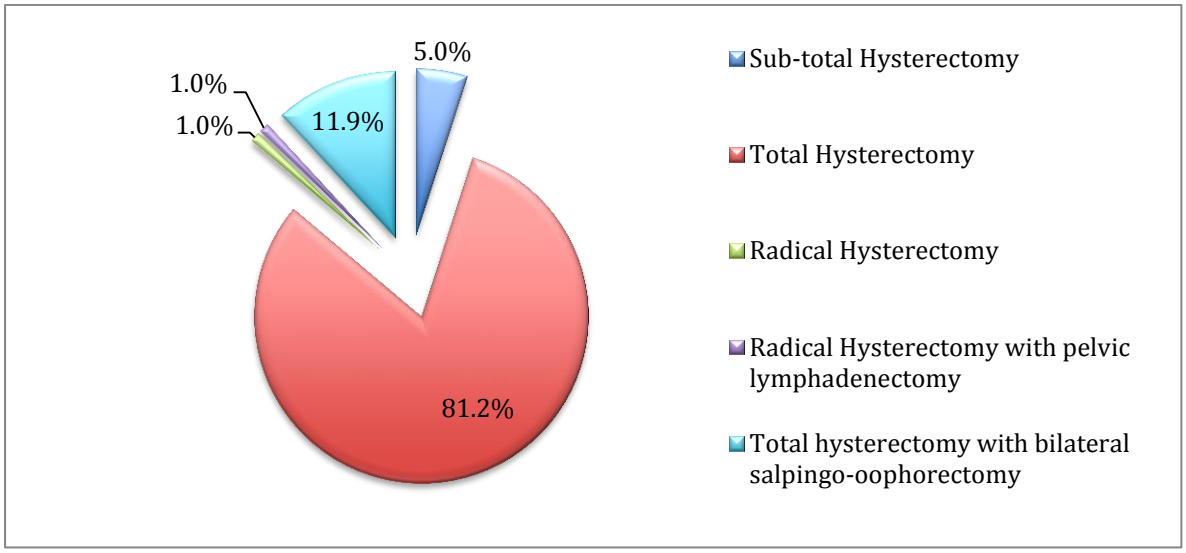


Figure 5.2: The type of hysterectomy performed

The results from the site of the operation showed that 79.2% (n = 80) of participants had an abdominal hysterectomy, 16.8% (n = 17) of participants had an laparoscopic assisted vaginal hysterectomy, and 4% (n = 4) had a vaginal hysterectomy.

5.2.2 Long-term complications specific to physiotherapy experienced by HIV-infected and non-infected women post hysterectomy

The results in Table 5.2 indicate that the participants' scores were consistently lowest in both Questions 7 and 8 of the bodily pain scale, compared with the physical functioning scale. Overall the participants scored the lowest for Question 7 (68.8%). At the six-month time point 51.5% (n=49) participants experienced no pain, while 48.5% (n=46) of participants experienced very mild to mild pain. Additionally, the results showed that 30.5% of participants (n=29) still felt that the pain interfered with their normal work at the six-month time point.

Table 5.2: Percentages for physical functioning and bodily pain scale post hysterectomy

Time	Physical Functioning	Bodily Pain	
	Q3	Q7	Q8
Baseline	42.1%	41.3%	41.6%
1	75.3%	65.5%	63.8%
3	84%	79.5%	79.6%
6	90.8%	90.7%	92.6%
Mean average over 6 months	72.8%	68.8%	69%

Question 3 comprised a mixture of activity-related questions and Figures 5.3 – 5.6 are a series of graphs depicting the change in responses over the six-month period. The results from Table 5.2 and Figure 5.6 show a marked improvement in the participants from baseline to month six. The majority of the participants (91.6%, n = 87) still struggled with performing vigorous activities, while 29.5% (n = 28) struggled with bending, kneeling or stooping six-months post hysterectomy (Figure 5.6).

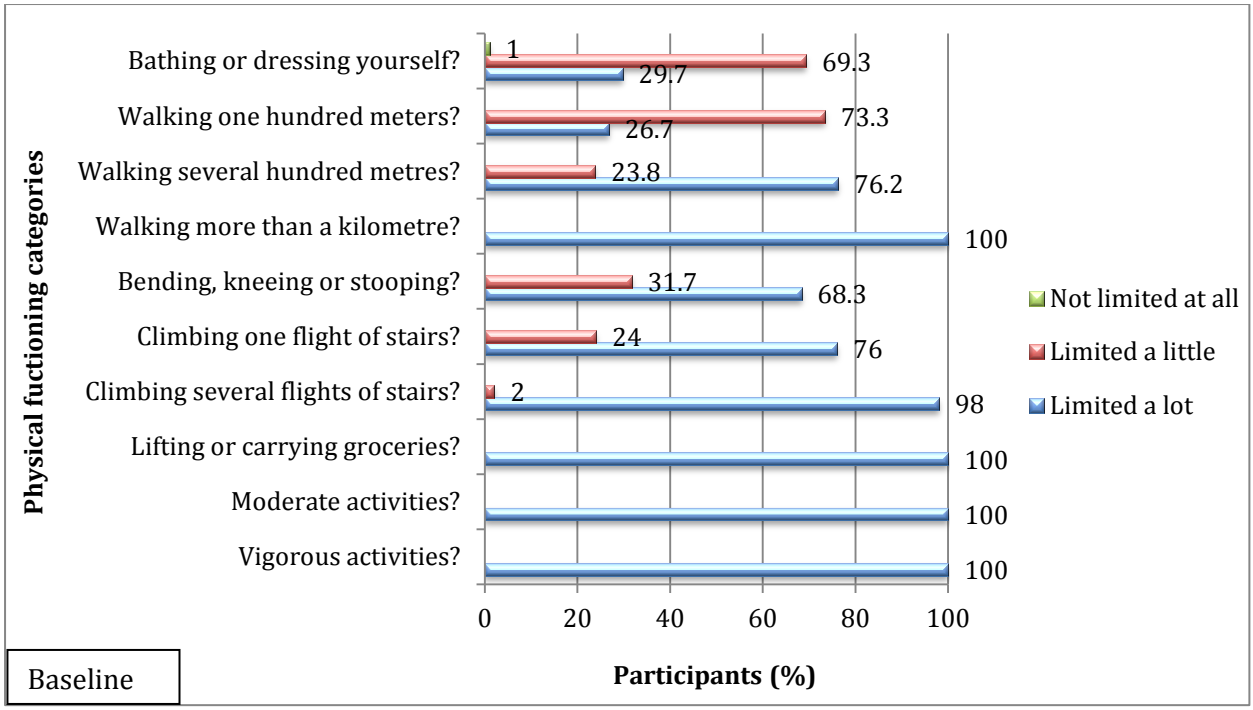


Figure 5.3: Physical functioning at baseline (N=101)

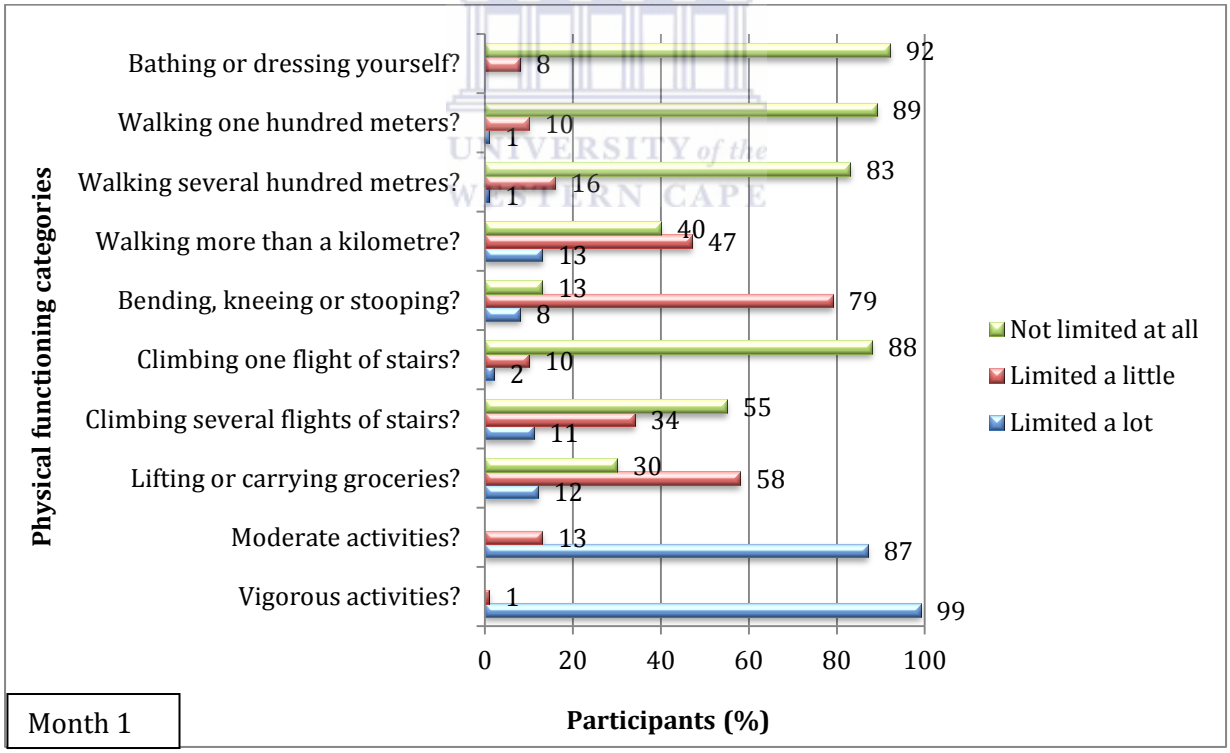


Figure 5.4: Physical functioning at month one (N=100)

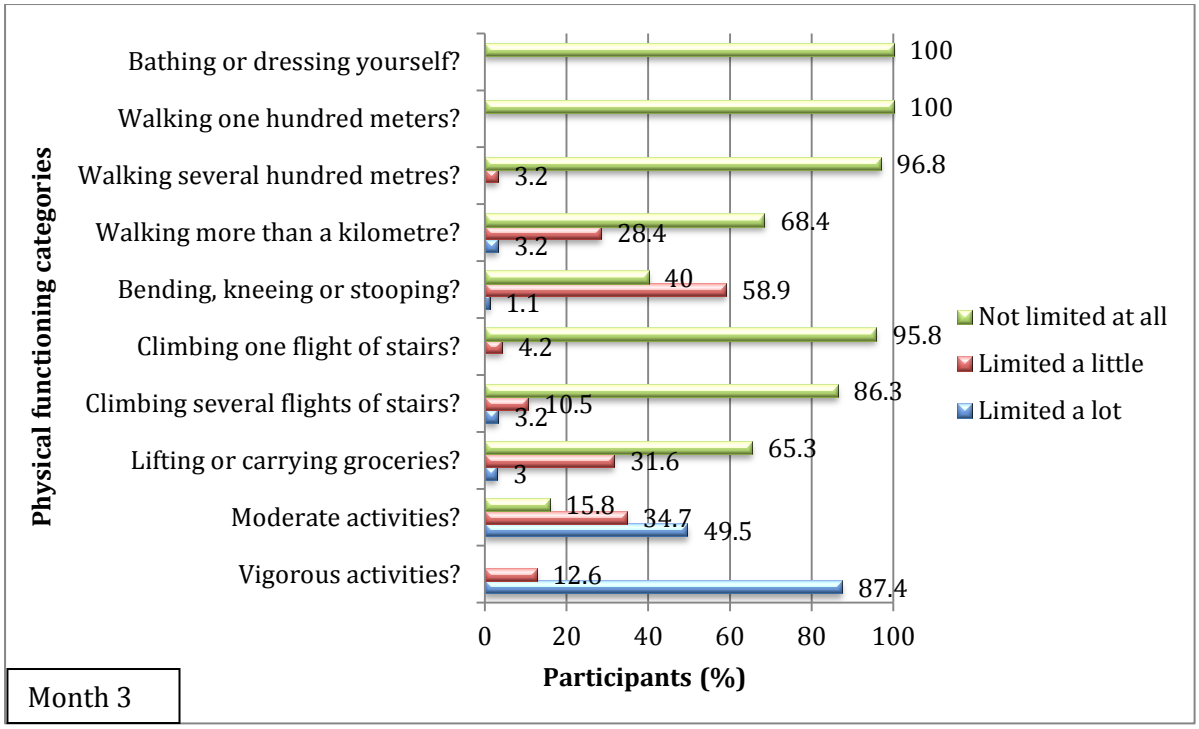


Figure 5.5: Physical functioning at month three (N=95)

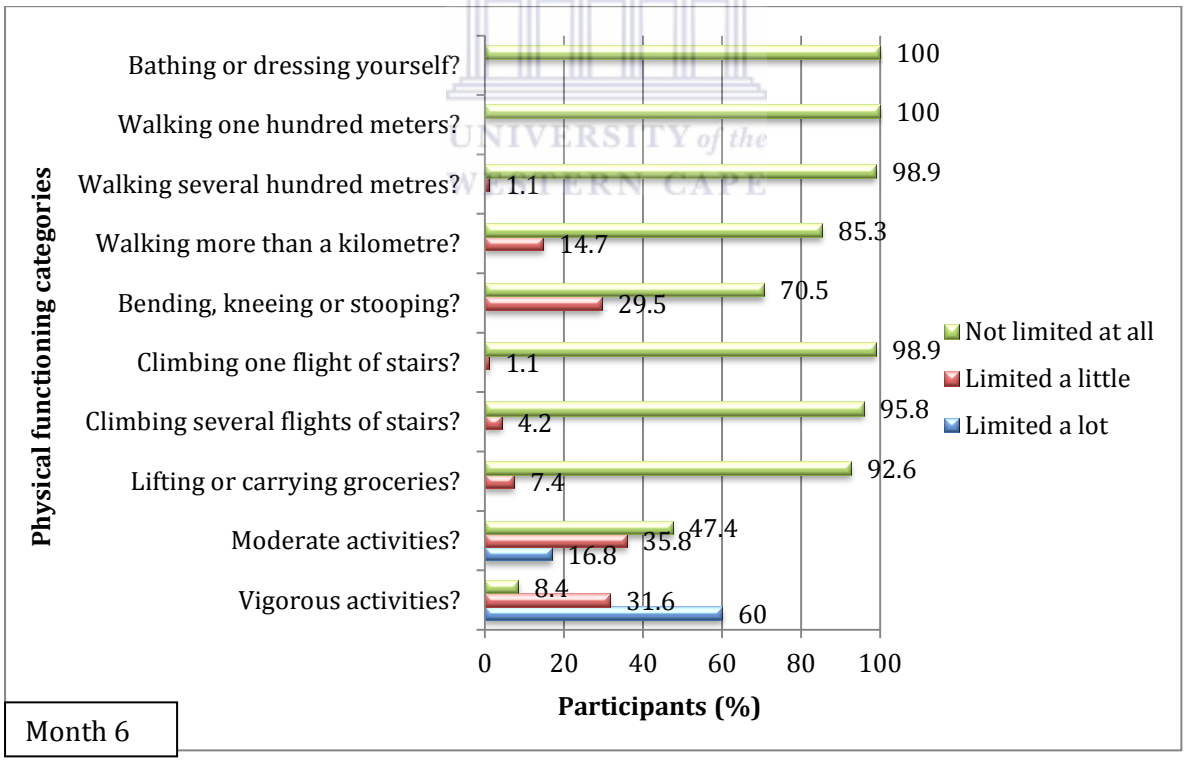


Figure 5.6: Physical functioning at month six (N=95)

There was no significant difference noted between time and lower limb swelling (t=-0.706; p=0.48) but time did have a significant effect on lower back pain (LBP) (t=3.26; p=0.001).

The LBP mean increased over time, indicating a significant improvement in LBP over the six-month time period. After three months, at least 50.5% (n=48) experienced LBP, while 16.8% (n=16) still experienced swelling in their lower limbs. However, after the sixth month, this reduced to 32.7% (n=28) and 8.5% (n=8) for LBP and lower limb swelling, respectively. The factors (explanatory variables) that influenced lower limb swelling and LBP of the participants are presented below.

a) Factors influencing lower limb swelling and lower back pain post hysterectomy

There were a few explanatory variables that had a significant effect on lower limb swelling and LBP. There was no significant difference noted in the overall means for lower limb swelling between the HIV non-infected and infected group (t=0.706; p=0.439) and the number of children the participants gave birth to (t=-0.003; p=0.998). In terms of LBP, there was no significant difference noted for the number of children they gave birth to (t=0.378; p=0.705), the type of hysterectomy (t=-0.619; p=0.536), and the site of the hysterectomy (t=-0.126; p=0.9). The means for those respective variables increased over the four time points.

There was a significant difference noted between the HIV groups for question LBP (t=4.138; p=0.000) with the overall mean score of the HIV-infected participants' (mean=3.36) being greater than the non-infected participants' (mean=2.95). This indicated that there were a greater number of HIV non-infected participants that had LBP following the procedure. The results of the difference between the various age groups were significant for lower limb swelling (t=-1.745; p=0.081) and LBP (t=3.311; p=0.001). In terms of lower limb swelling, the mean decreased as age increased (Figure 5.7). There was also a significant difference between the age groups at each time point (t=1.719; p=0.086). At baseline, the mean decreased with an increase in age. Thereafter at one, three and six months, the mean remains constant over the age groups.

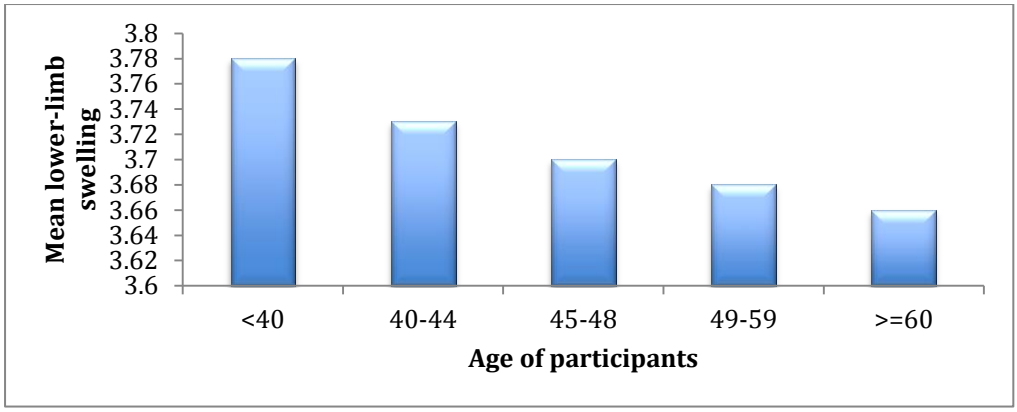


Figure 5.7: Mean of lower limb swelling vs age

The mean scores for LBP showed the ≥ 60 (over 60) year age group as greater than the <60 (less than 60) year age groups (Figure 5.8). This indicates that fewer participants in ≥ 60 years of age group had LBP at the six-month time point post hysterectomy.

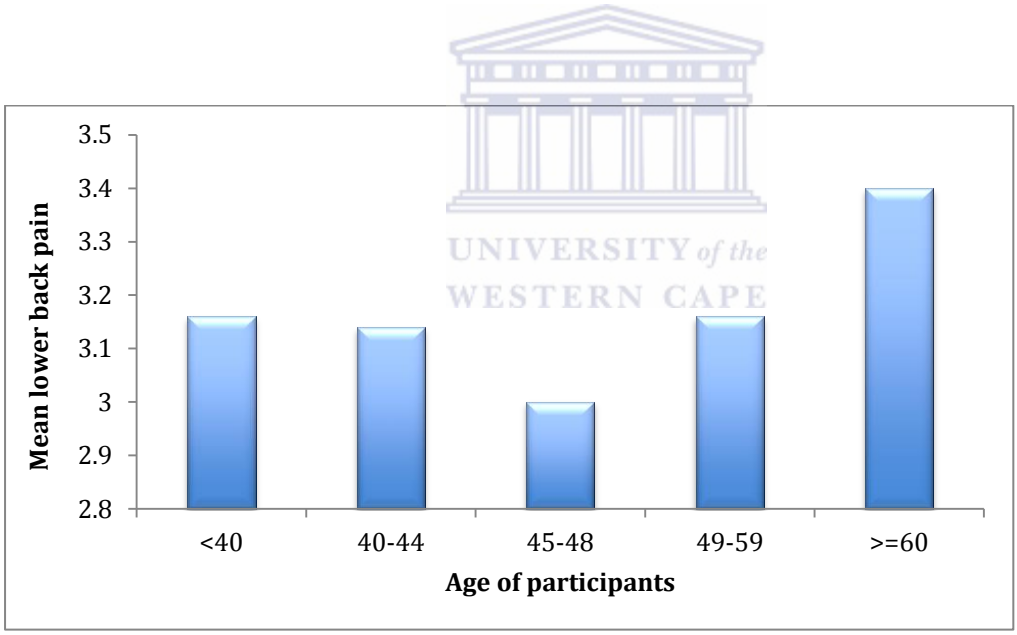


Figure 5.8: Mean of lower back pain vs age of participants

There was a significant difference between the type of hysterectomy (t=1.904; p=0.057) and the site of the hysterectomy (t=1.979; p=0.048) for lower limb swelling. The mean for the total hysterectomy group (mean=3.76) was greater than "other" (sub-total hysterectomy, radical hysterectomy, radical hysterectomy with pelvic lymphadenectomy, and total hysterectomy with bilateral salpingo-oophorectomy)

hysterectomy group mean (mean=3.53). In terms of the incision site, the mean for the "other" (vaginal or laparoscopic assisted vaginal hysterectomy) group (mean=3.83) was greater than the total abdominal incision group (mean=3.69). This indicated that participants who underwent a total hysterectomy either vaginally or laparoscopically, had less lower-limb swelling over the six-month period.

The most common complications described by the participants in the open-ended Question 13 were "the wound site becoming infected" (n=9) at month one, "pain at the incision site when cold" (n=3) at months three and six and "bladder incontinence/vagina feeling loose" (n=3) at month six (Figure 5.9).

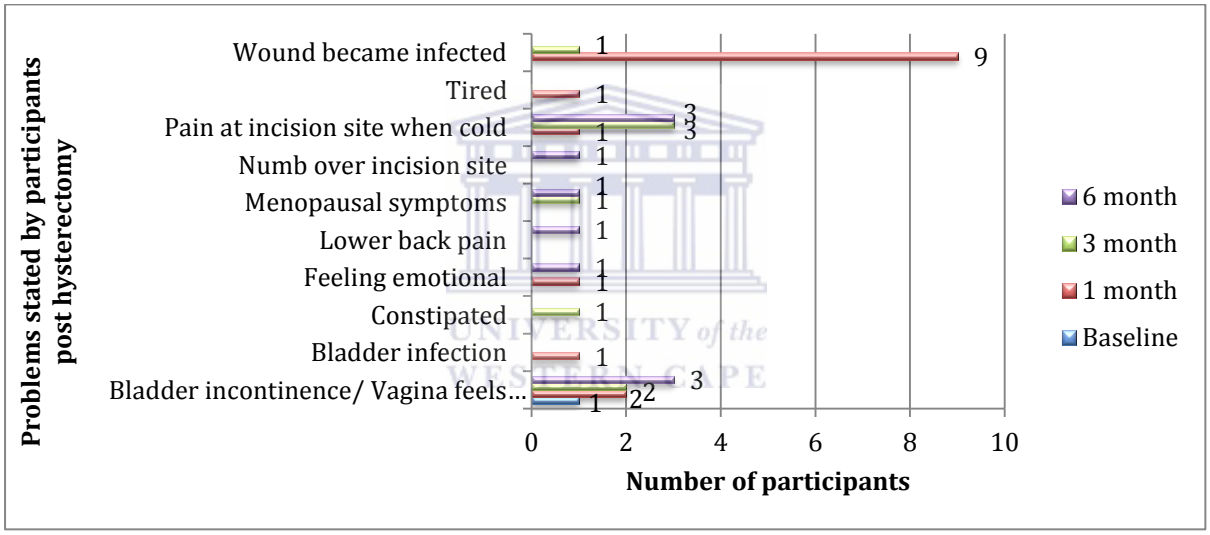


Figure 5.9: Problems experienced by participants post hysterectomy over the six-month time period

In terms of bladder and bowel function following the procedure, 70.3% (n=71) of participants stated that they were experiencing UI at baseline, and 42.1% (n=40) still struggled with bladder control at six months. Four participants experienced urinary incontinence, which started < three-months prior to surgery, which did not affect the results.

5.2.3 The quality of life of participants post hysterectomy

The results show that the QoL of the participants improved over the six-month time period (Table 5.3 and Table 5.4). The physical health summary measure scale was more affected than the mental health summary measure scale at each of the four time points, indicating that the physical health of the participants was more affected than their mental health post hysterectomy. Although the percentages increased and were relatively high for each of the scales within the physical health measure at the six-month point, the respective limitations that resulted in the relatively low scores compared to the mental health scales were discussed in the section above and the predisposing factors will be discussed in the following sections.

Table 5.3: The physical health summary scores post hysterectomy

Time	Physical functioning	Physical Role	Bodily Pain		General Health		Physical health summary measure
	Q3	Q4	Q7	Q8	Q1	Q11	Total
Baseline	42.1%	43.5%	41.3%	41.6%	57.6%	85.5%	**51.9%**
1	75.3%	69.8%	65.5%	63.8%	54.2%	79.6%	**68%**
3	84%	80.8%	79.5%	79.6%	60.8%	81.7%	**77.7%**
6	90.8%	87.6%	90.7%	92.6%	66%	84.1%	**85.3%**
Average over 6 months	**72.8%**	**70.2%**	**68.8%**	**69%**	**59.6%**	**82.7%**	

Table 5.4: The mental health summary scores post hysterectomy

Time	Vitality/ Mental health	Social functioning		Emotional Role	Mental health summary measure
	Q9	Q6	Q10	Q5	Total
Baseline	70.3%	84.6%	96.8%	90.4%	**85.5%**
1	71.5%	93.8%	94.6%	96.5%	**89.1%**
3	75.8%	98.6%	97%	98.1%	**92.3%**
6	79.3%	99.4%	97.4%	98.5%	**93.7%**
Average over 6 months	**74.1%**	**94%**	**96.4%**	**95.8%**	

5.2.3.1 Physical health of HIV-infected and non-infected women post hysterectomy

As in the previous chapter, Questions 3, 4, 7, 8, 1 and 11 were independent scales in the questionnaire that make up the physical health summary measure of the patients. Each scale

was independently evaluated in order determine the impact of a hysterectomy, and to establish which factors influenced the physical health of participants post hysterectomy: Question 3 evaluated the physical functioning of the patient; Question 4 the physical role of the patient; Questions 7 and 8 evaluated bodily pain; and Questions 1 and 11 evaluated the general health of the patient post hysterectomy, the results being presented below. Time was shown to have a significant effect on all the scales (physical functioning, physical role, bodily pain and general health) with the exception of Question 11 in the general health scale (Table 5.5). Thus, as time increased, the physical health of the participants improved (Table 5.5).

Table 5.5: The effect of time on physical health

	Physical functioning	Physical Role	Bodily Pain		General Health	
	Q3	Q4	Q7	Q8	Q1	Q11
Time	7.111****	2.102**	3.185***	3.326***	2.357**	0.546

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 test statistic < 3.29)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

a) Factors influencing physical health post hysterectomy

The results in Table 5.6 show that the means for the HIV non-infected participants were marginally greater than the HIV-infected participants from baseline to month six for all the scales in the physical health category. However, the differences in the means between the two groups were only significant for physical role (Question 4) (t=-2.105; p=0.035) and bodily pain (Question 8) (t=-2.400; p=0.016), indicating that the HIV non-infected group scored significantly better in the physical functioning scale and in Question 8 of the pain scale. There was no significant difference in the trends between the groups in their interaction with time over the six-month period for the physical health category (Table 5.6).

Table 5.6: The effect of HIV on physical health post hysterectomy

		Physical functioning	Physical Role	Bodily Pain		General Health	
HIV	***Time***	***Q3***	***Q4***	***Q7***	***Q8***	***Q1***	***Q11***
Non-infected	*Baseline*	12.96	9.08	2.43	2.2	2.82	17.33
	1	22.12	14	4.04	3.26	2.8	16.64
	3	24.92	16.35	4.88	4.04	3.02	17
	6	26.98	17.63	5.55	4.65	3.37	17.24
Infected	*Baseline*	12.32	8.32	2.52	1.96	2.94	16.86
	1	23.04	13.92	3.82	3.12	2.62	15.18
	3	25.5	15.96	4.65	3.91	3.06	15.63
	6	27.48	17.38	5.33	4.61	3.23	16.35
HIV	*GEE test*	-1.315 p(0.189)	-2.105** p(0.035)	-1.295 p(0.195)	-2.400** p(0.016)	-0.647 p(0.518)	-1.511 p(0.131)
Time*HIV		1.211 p(0.226)	1.16 p(0.246)	-0.532 p(0.595)	1.55 p(0.121)	-1.38 p(0.168)	-0.862 p(0.389)

***Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*

The participants were grouped into five age groups, namely: <40, 40-44, 45-48, 49-59, and ≥60 years of age. The means for the physical functioning (Question 3), physical role (Question 4) and bodily pain (Questions 7 and 8) scale showed that there was an increase in score over time for all age groups (Table 5.8). The mean for the general health (Questions 1 and 11) scale behaved slightly differently. For Question 1 of the general health scale concerning participants' ≤ 59 years of age, there was a decrease in the mean from baseline to month one, followed by an increase in the mean up to month six. In addition, in Question 11 of the general health scale, there is a decrease in the mean from baseline to month one followed by an increase up to six months for all age groups. The results only yielded a significant difference between the age groups for Question 3 (t=-1.726; p=0.084), where the mean decreased with an increase in age. Similarly, Question 4 (physical role) was the only question where the results showed a significant difference between the age groups in their interaction with time (t=1.739; p=0.082). At baseline and month one, the mean for Question 4 decreased slightly with an increase in age, while for months three and six it increased slightly with an increase in age (Table 5.7)

Table 5.7: The effect of age on physical health post hysterectomy

		Physical functioning	Physical Role	Bodily Pain		General Health	
Age	***Time***	**Q3**	**Q4**	**Q7**	**Q8**	**Q1**	**Q11**
<40	*Baseline*	13.05	8.82	2.73	2.14	2.91	16.23
	1	23.32	14.14	4.09	3.32	2.86	15.32
	3	25.86	15.86	4.76	3.9	3.23	15.67
	6	27.77	17.27	5.29	4.62	3.5	16.24
40-44	*Baseline*	12.27	8.41	2.45	1.95	2.82	17.41
	1	22.55	13.55	3.55	3	2.5	15.68
	3	24.9	16	4.5	3.85	3.1	16.25
	6	26.86	17.24	5.35	4.5	3.19	16.75
45-48	*Baseline*	12.13	8.65	2.13	2	2.83	16.7
	1	22.7	14.43	3.96	3.22	2.7	15.83
	3	25.35	16.48	4.91	4	2.96	16.26
	6	27.43	17.87	5.57	4.74	3.35	16.65
49-59	*Baseline*	12.81	9.24	2.57	2.19	3.05	17.57
	1	22.86	14.33	4.14	3.29	2.67	16.29
	3	25.3	16.1	4.8	4.15	2.9	16.45
	6	27.35	17.6	5.45	4.65	3.1	17
≥60	*Baseline*	13.23	8.23	2.54	2.15	2.77	18
	1	20.58	12.83	3.92	3.08	2.92	16.92
	3	24	16.45	4.91	4	3	17.73
	6	26.18	17.55	5.64	4.64	3.36	18
Age	*GEE test*	-1.726* p(0.084)	-1.589 p(0.112)	-0.742 p(0.458)	-0.875 p(0.382)	-0.555 p(0.579)	1.142 p(0.253)
Time*Age		0.080 p(0.936)	1.739* p(0.082)	0.799 p(0.424)	0.682 p(0.495)	-1.285 p(0.199)	-0.006 p(0.995)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*

Table 5.8 shows that there was no significant difference in the number of children a participant has given birth to and their physical health. The mean for physical functioning (Questions 3), physical role (Question 4) and bodily pain (Questions 7 and 8) increased over time for all participants regardless of the number of children the patient had previously given birth to. However, the mean scores for general heath (Question 1 and 11) initially decreased from baseline to month one and then increased with time (Table 5.8).

Table 5.8: The effect of the number of children on physical health post hysterectomy

No. of Children		Physical functioning	Physical Role	Bodily Pain		General Health	
	Time	Q3	Q4	Q7	Q8	Q1	Q11
<=1	*Baseline*	11.54	7.13	2.21	1.83	2.79	17.25
	1	23	13.88	3.71	2.75	2.63	16.04
	3	25.17	16.43	4.52	3.78	2.83	16.17
	6	27.26	17.3	5.22	4.52	3.22	16.7
2	*Baseline*	12.45	9.13	2.58	2.16	2.94	17.03
	1	22.58	14.19	3.97	3.32	2.71	16.06
	3	25.1	16.3	4.9	4.07	3.2	16.77
	6	27.2	17.73	5.53	4.77	3.53	17.13
3	*Baseline*	14	9.96	2.7	2.09	2.87	16.39
	1	22.83	14.35	4.22	3.65	2.87	15.04
	3	25.7	16.39	4.95	4.19	3.3	15.81
	6	27.35	17.48	5.52	4.62	3.26	16.33
>=4	*Baseline*	12.7	8.52	2.39	2.22	2.91	17.74
	1	21.86	13.32	3.82	3	2.64	16.45
	3	24.86	15.38	4.67	3.86	2.76	16.43
	6	27.1	17.43	5.48	4.57	3.1	16.95
No. of children	GEE test	0.514 p(0.607)	0.086 p(0.931)	0.033 p(0.974)	0.474 p(0.635)	-0.063 p(0.95)	-0.384 p(0.701)

As mentioned previously, in order to analyse the data, the participants had to be grouped into a total hysterectomy group and the "other" group. This was owing to the small number of participants who underwent those respective procedures. The results showed that participants who underwent a total hysterectomy had greater mean scores in the physical health category than those who underwent any other type of hysterectomy (Table 5.9). This difference was significant for all the scales (Table 5.9) except general health [Question 1 (t=-0.951; p=0.342) and Question 11 (t=-1.176; p=0.024)].

Table 5.9: The effect of the type of hysterectomy on physical health post hysterectomy

Type of Hysterectomy		Physical functioning	Physical Role	Bodily Pain		General Health	
	Time	Q3	Q4	Q7	Q8	Q1	Q11
Total Hysterectomy	*Baseline*	12.82	8.99	2.52	2.15	2.85	17.11
	1	22.64	14.16	4.01	3.28	2.78	16
	3	25.32	16.22	4.83	4.06	3.06	16.52
	6	27.43	17.7	5.53	4.69	3.33	16.99
Other	*Baseline*	11.89	7.47	2.26	1.79	3	17.05
	1	22.32	13.11	3.58	2.79	2.42	15.53
	3	24.72	15.89	4.5	3.61	2.94	15.56
	6	26.33	16.67	5.06	4.39	3.17	16.06
Type of hysterectomy	*GEE test*	-1.875* p(0.061)	-2.58*** p(0.010)	-2.541** p(0.011)	-2.718*** p(0.007)	-0.951 p(0.342)	-1.176 p(0.024)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*
** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*

Grouping for the site of the operations was done as stated previously. Table 5.10 shows that the participants who underwent a vaginal or laparoscopic assisted vaginal hysterectomy ("other") had greater mean scores than those who had an abdominal incision in all scales of the physical health category. In addition, the difference between the two groups was statistically significant (Table 5.10).

Table 5.10: The effect of the operative site on physical health post hysterectomy

Site of Hysterectomy		Physical functioning	Physical Role	Bodily Pain		General Health	
	Time	Q3	Q4	Q7	Q8	Q1	Q11
Abdominal incision	*Baseline*	12.24	8.16	2.34	1.99	2.66	16.94
	1	22.04	13.49	3.72	2.92	2.56	15.68
	3	24.75	15.84	4.56	3.77	2.91	16.01
	6	26.86	17.26	5.35	4.53	3.22	16.53
Other	*Baseline*	14.19	10.76	3	2.43	3.71	17.71
	1	24.62	15.71	4.71	4.19	3.29	16.76
	3	26.86	17.29	5.55	4.75	3.52	17.55
	6	28.57	18.38	5.8	5	3.57	17.85
Site of hysterectomy	***GEE test***	7.151**** p(0.000)	6.017**** p(0.000)	7.743**** p(0.000)	8.439**** p(0.000)	5.191**** p(0.000)	2.07** p(0.038)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

5.2.3.2 Mental health of HIV-infected and non-infected women post hysterectomy

Overall, the results showed that time had a significant effect on the majority of the variables (Questions 9, 6 and 5). As time increased, the mental health of the participants improved (Table 5.11). The factors (explanatory variables) influencing the mental health are presented below.

Table 5.11: The effect of time on mental health post hysterectomy

	Vitality/ Mental health	Social functioning		Emotional Role
	Q9	Q6	Q10	Q5
Time	3.739**** p(0.000)	1.893* p(0.058)	0.901 p(0.368)	2.369** p(0.018)

* *Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*
** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

a) Factors influencing mental health post hysterectomy

The results in Table 5.12 indicted that there was a small difference between the mean scores of the HIV non-infected and infected groups. The mean score increased over time for all variables except Question 10 (social functioning). From baseline to month one there was a decrease in the mean score in Question 10 for the HIV-infected participants, followed by an increase until month six. No significant difference was noted in the overall mean results between the two groups for all variables (Table 5.12). In terms of the difference in the interaction between the groups with time over the six-month period, the only variable to yield a significant result was Question 9 (t= -3.516; p=0.000). In Question 9, the HIV non-infected group had a lower mean than the HIV-infected group. Thereafter, from months one to six, the mean for the HIV non-infected group was greater than the HIV-infected group.

Table 5.12: The effect of HIV status on mental health post hysterectomy

		Vitality/ Mental health	Social functioning		Emotional Role
HIV	***Time***	*Q9*	*Q6*	*Q10*	*Q5*
Non-infected	*Baseline*	30.69	4.12	4.75	13.59
	1	32.94	4.8	4.82	14.46
	3	34.92	4.98	4.94	14.8
	6	36.41	5	4.9	14.9
Infected	*Baseline*	32.64	4.34	4.94	13.54
	1	31.44	4.58	4.64	14.48
	3	33.22	4.87	4.76	14.65
	6	34.91	4.93	4.85	14.65
HIV status	*GEE test*	0.891 p(0.373)	0.058 p(0.954)	-0.987 p(0.324)	0.714 p(0.475)
Time*HIV status		-3.516**** p(0.000)	-1.101 p(0.271)	-1.42 p(0.156)	-1.062 p(0.288)

**** *Significant at the 0.1% level of significance (3.29 ≤ test statistic)*

The results showed that the mean increased over time for Questions 9 (vitality/ mental health), 6 (social functioning) and 5 (emotional role). Except for the <40 age group, in Question 10, the mean results for the age categories showed a decrease from baseline to month one, followed by an increase in the mean to month six. In the <40 age group, the results steadily decreased from baseline to month three, and then increased from month three to month six although it was fractionally greater than the baseline value. There was a significant difference between the means of the age groups at the 10% level for questions 9 (t=1.822; p=0.068) and 5 (t=1.686; p=0.092), where the mean rose slightly with an increase in age. Furthermore, there was a significant difference between the age groups in their interaction with time for Question 9 (t=-1.947; p=0.052), whereas at baseline, the mean did not increase with an increase in age. From month one onwards, the mean increased with an increase in age (Table 5.13).

Table 5.13: The effect of age on mental health post hysterectomy

		Vitality/ Mental health	Social functioning		Emotional Role
Age	***Time***	*Q9*	*Q6*	*Q10*	*Q5*
<40	*Baseline*	30.45	4.27	4.91	13.41
	1	31.73	4.59	4.77	14.36
	3	33.71	4.9	4.76	14.59
	6	35	4.9	4.95	14.55
40-44	*Baseline*	32.27	4.41	4.95	13.23
	1	31.27	4.5	4.55	14.23
	3	33.4	4.85	4.75	14.52
	6	34.95	5	4.75	14.57
45-48	*Baseline*	30.65	4.04	4.91	13.61
	1	32.22	4.83	4.87	14.91
	3	34	5	4.91	14.96
	6	35.52	5	4.96	15
49-59	*Baseline*	32.62	4.29	4.9	13.43
	1	32.48	4.76	4.71	14.14
	3	33.75	4.9	4.9	14.65
	6	36.3	4.95	4.95	14.85
≥60	*Baseline*	32.85	4.08	4.31	14.54
	1	34.17	4.83	4.75	14.83
	3	36.91	5	5	15
	6	37.55	5	4.64	15
Age	*GEE test*	1.822* p(0.068)	-0.408 p(0.683)	-1.62 p(0.105)	1.686* p(0.092)
Time*Age		-1.947* p(0.052)	0.478 p(0.633)	0.768 p(0.442)	-1.067 p(0.286)

** Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*

No significant difference was found between the number of children the participants previously gave birth to and their mental health (Table 5.14). The means for Question 9 (vitality/mental health), 6 (social functioning) and 5 (emotional role) increased over time. In Question 10 (social functioning) the mean increased over time for the ≤ 1child group, but decreased from baseline to one month and subsequently increased till month six for the ≥ 2 children groups. There was a significant difference noted at the 10% level between the groups in their interaction with time for Question 6 (social functioning). The results showed that the mean increased with an increase in the number of children up to one month, and later stayed constant (Table 5.14).

Table 5.14: The effect of the number of children on mental health post hysterectomy

No. of Children	*Time*	Vitality/ Mental health	Social functioning		Emotional Role
		Q9	*Q6*	*Q10*	*Q5*
≤1	*Baseline*	30.42	3.75	4.54	13.04
	1	31.71	4.54	4.75	14.67
	3	33.48	5	4.91	14.87
	6	34.43	4.91	4.83	14.91
2	*Baseline*	33.19	4.39	4.94	14.23
	1	33.48	4.77	4.71	14.68
	3	35.13	4.93	4.83	15
	6	36.7	5	4.87	15
3	*Baseline*	30.52	4.61	4.96	12.91
	1	31.26	4.7	4.7	13.78
	3	33.38	4.86	4.81	14.13
	6	35.1	4.95	4.9	14.13
≥4	*Baseline*	32	4.13	4.91	13.87
	1	31.86	4.73	4.77	14.68
	3	34	4.9	4.86	14.81
	6	36.19	5	4.9	15
No. of children	*GEE*	-0.336 p(0.737)	1.347 p(0.178)	1.556 p(0.120)	0.281 p(0.779)
Time* No. of children		0.787 p(0.431)	-1.814* p(0.070)	-1.492 p(0.136)	-0.96 p(0.337)

** Significant at the 10% level of significance (1.645 ≤ test statistic < 1.96)*

The results in Table 5.15 showed that the mean of Question 9 (vitality/mental health) and Question 6 (social functioning) for the total hysterectomy group was greater than the "other" group. The difference between the two groups was only statistically significant for Question 6 (t=-2.225; p=0.026). There was no difference in the mean results for Question 5 and Question 10 between the two groups (Table 5.15).

Table 5.15: The effect of type of hysterectomy on mental health post hysterectomy

Type of hysterectomy		Vitality/ Mental health	Social functioning		Emotional Role
	Time	*Q9*	*Q6*	*Q10*	*Q5*
Total hysterectomy	*Baseline*	31.85	4.28	4.83	13.57
	1	32.41	4.75	4.75	14.48
	3	34.34	4.94	4.87	14.7
	6	36	4.99	4.87	14.72
Other	*Baseline*	30.79	4	4.89	13.53
	1	31.26	4.42	4.63	14.42
	3	33.06	4.89	4.78	14.83
	6	34.33	4.89	4.89	15
Total hysterectomy	GEE test	-1.204 p(0.229)	-2.225** p(0.026)	-0.089 p(0.029)	0.26 p(0.795)

***Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*

The participants were grouped according to the site of the hysterectomy (Table 5.16). As in the physical health section, for reasons of analysis, the "other" group comprises participants who underwent a vaginal or laparoscopic assisted vaginal hysterectomy. The mean results of all the variables with the exception of Question 5 (emotional role) were greater for the "other" group than for participants who had an abdominal incision. These differences between the groups were statistically significant for Questions 9, 6 at the 5% level and 10 at the 1% level (Table 5.16)

Table 5.16: The effect of the operative site on mental health post hysterectomy

Site of hysterectomy	Time	Vitality/ Mental health	Social functioning		Emotional Role
		Q9	*Q6*	*Q10*	*Q5*
Abdominal incision	*Baseline*	31.33	4.2	4.83	13.54
	1	31.59	4.62	4.68	14.46
	3	33.63	4.91	4.81	14.76
	6	35.2	4.96	4.84	14.84
Other	*Baseline*	32.9	4.33	4.9	13.67
	1	34.43	4.95	4.9	14.52
	3	35.85	5	5	14.57
	6	37.5	5	5	14.52
Site of hysterectomy	*GEE test*	2.067** p(0.039)	2.293** p(0.022)	2.826*** p(0.005)	-0.273 p(0.785)

** *Significant at the 5% level of significance (1.96 ≤ test statistic < 2.58)*
*** *Significant at the 1% level of significance (2.58 ≤ test statistic < 3.29)*

5.2.3.3 Reported health transition of participants of HIV-infected and non-infected women post hysterectomy

The results showed that there was no significant difference between time and the reported health transition of patients (Question 2) (t=1.325; p=0.185). This indicates that the participants' scores did not significantly improve over time. The factors affecting the reported health transition are presented below.

a) Factors influencing reported health transition

There was no significant difference in the overall mean scores between the HIV non-infected and HIV-infected group (t=0.735; p=0.462), the number of children the participants gave birth to (t=-0.473; p=0.636) and the type of hysterectomy the participants underwent (t=-1.440; p=0.150) for reported health transition (Question 2). The means for those respective variables initially decreased from baseline to month one and then increased to month six.

There was a significant difference between the various age groups (t=-1974; p=0.048) with the mean decreasing slightly with an increase in age (Table 5.17). The results showed that the mean increased over time for the <40 year age group and the ≥60 year

age group. For the other age groups, there was a decrease in the mean from baseline to month one, followed by an increase over time (Table 5.17). There was no significant difference between the age groups in their interaction with time (t=-0.102; p=0.919) as shown by the minimal difference between the age groups at the various time points.

Table 5.17: The effect of the age on reported health transition

	Baseline	1 month	3 month	6 Month
<40	2.95	3	3.18	3.27
40-44	3.05	2.91	3	3.14
45-48	2.87	2.65	2.87	3.22
49-59	2.71	2.52	3	3.1
≥60	2.54	2.58	2.91	3.09

The participants were grouped as per the previous sections for the site of the procedure, with the results showing a statistically significant difference (t=2.07; p=0.038) between the two groups ("abdominal incision" and "other") (Table 5.18). Participants who underwent an abdominal incision had a lower mean score from month one to six (Table 5.18) when compared to participants who underwent a vaginal or a laparoscopic assisted vaginal hysterectomy ("other").

Table 5.18: The effect of the site of incision on reported health transition

	Baseline	1-month	3-month	6-Month
Abdominal incision	2.79	2.63	2.88	3.12
Other	3.10	3.19	3.43	3.38

5.2.3.4 The impact of pelvic floor complications in HIV-infected and non-infected women post hysterectomy

In the bowel/rectum section the results show that all participants had a score of 100% (maximum value = 28) over the three time points. The scores in the vagina/pelvis section were 96% in month one, 99% in month three and 100% in month six (maximum value of 28). This indicated that no adverse effect was caused to the bowel/rectum, vagina/pelvis by the hysterectomy in this cohort of participants. An improvement from months one to six in the

bladder section was noted. The scores were 74.6% in month one, 82.8% in month three, and 88.1% in month six. Although the scores did improve over time, the results show that the QoL of participants who underwent a hysterectomy and experienced UI was significantly affected (p=0.003) by their bladder control post hysterectomy. The result showed that time did not have a significant impact (t=1.049; p=0.294) on the pelvic floor response of the participants, but this could have been due to the high bowel/rectum and vagina/pelvis scores. The factors (explanatory variables) that influenced the impact of the hysterectomy on the pelvic floor are detailed below.

a) Factors influencing the impact of a hysterectomy on the pelvic floor

No variables had a significant effect on participants experiencing UI postoperatively (Table 5.19). The only variable that had a significant effect on the bladder section of the pelvic floor (impact questionnaire: t=2.925; p=0.003) was the site of the hysterectomy (Table 5.19), with the mean result for participants in the "other" group being greater than those in the abdominal incision group. The differences between the other variables for the bladder response section were minimal, with the mean increasing over time for both groups.

Table 5.19: The effect of explanatory variables on bladder responses and postoperative urinary incontinence

	HIV status	Age	Number of children	Type of hysterectomy	Site of hysterectomy
Bladder responses (PFIQ) GEE test	-0.458 (p=0.647)	0.325 (p=0.745)	-0.917 (p=0.359)	-0.173 (p=0.863)	2.925 (p=0.003)
Postoperative UI	p=0.711	p=0.579	p=0.064	p=0.292	p=0.507

5.2.3 Health-seeking behaviour of HIV-infected and non-infected women post hysterectomy

Not all the participants who had postoperative complications sought medical attention or advice (Figure 5.10), with the majority of the patients stating that their reasons for not seeking advice were that they would be given analgesics at baseline (n=80, 79%), month three (n=25; 26%), and month six (n=31; 33%); while at month three, the main reason for not

seeking medical attention stated was that the problem would resolve itself over time (n=40; 42%) (Figure 5.11).

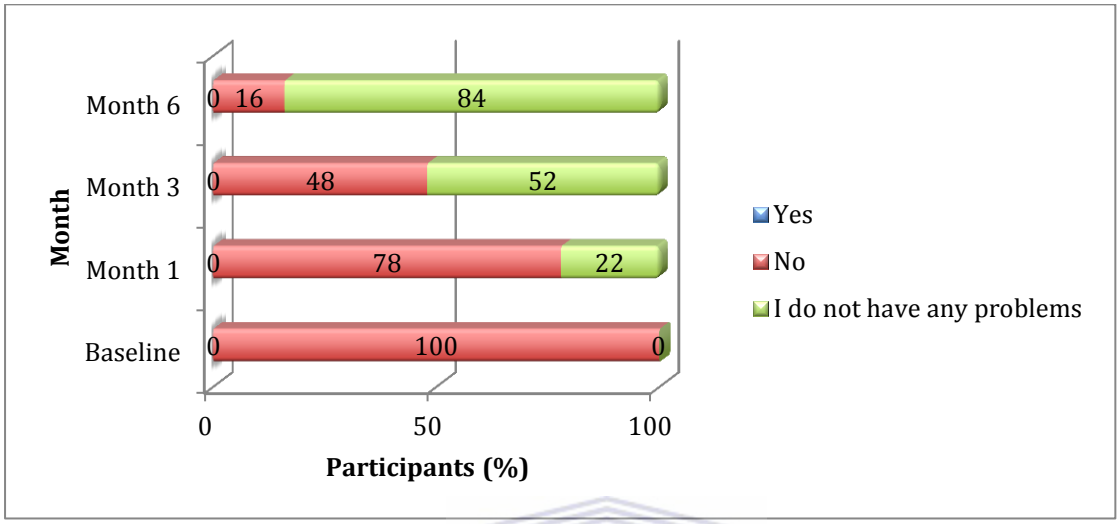


Figure 5.10: Percentage seeking medical attention for postoperative complications

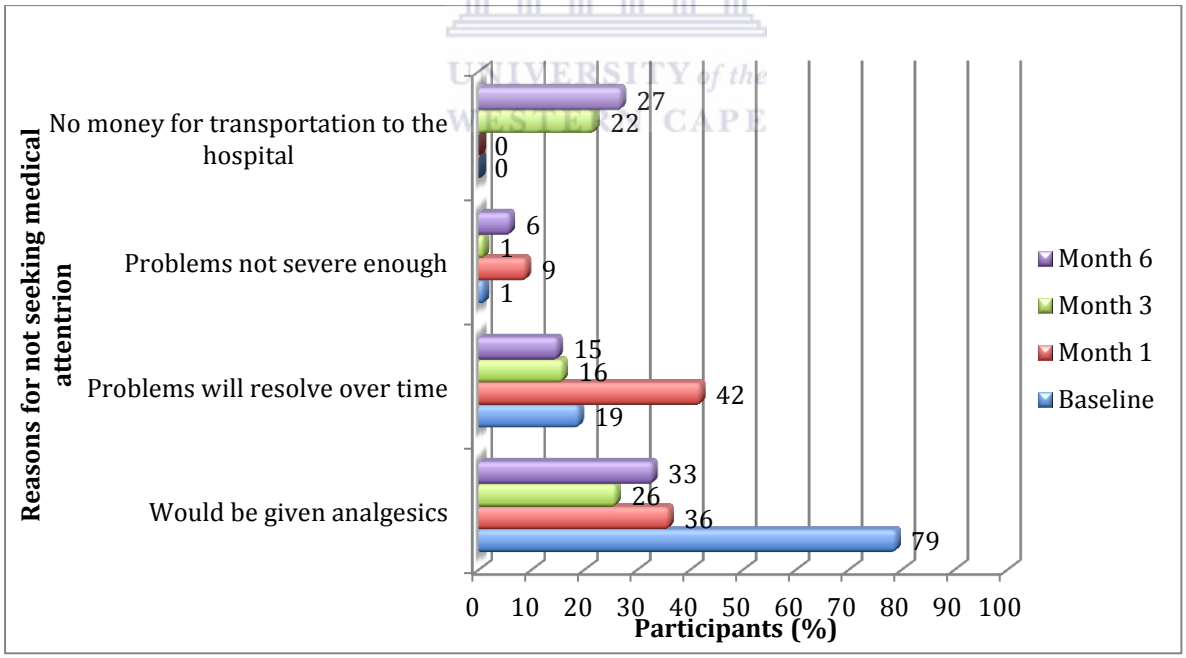


Figure 5.11: Reasons for not seeking medical attention for postoperative complications

5.3 DISCUSSION

The purpose of this phase of the study was to determine the long-term complications and QoL of women post hysterectomy. The physical and mental health of the participants was analysed according to various scales, with the results showing that the physical health of the participants was more affected than their mental health. Furthermore, despite the overall well-being of the participant improving over time, there were complications and predisposing factors that resulted in a longer recovery time that negatively impacted on their QoL. The main findings from the demographic section and at the final time point (month six) post hysterectomy are discussed below.

5.3.1 Socio-demographic profile of HIV-infected and non-infected women post hysterectomy

The results from the socio-demographic section of the study showed that HIV-infected women were more likely to be younger (p=0.000) and unmarried (p=0.000). These results are similar to international (Massad et al., 2007) and national studies (Moodley & Mould, 2005) where the authors also found that the HIV-infected women undergoing a hysterectomy were younger than the HIV non-infected women. In the national study, the age difference noted between HIV-infected and HIV non-infected women was 13 years (Moodley & Mould, 2005); the present study yielded similar results with an age difference of 10 years between groups. While HIV does not predispose infected women to severe forms of gynaecological disorders resulting in a hysterectomy (Massad et al., 2007), these women could have had cervical neoplasia, which is a risk factor in HIV-infected women (Massad et al., 2001). Cervical neoplasia is closely linked to the presence of human papillomavirus (HPV). Immunocompromised women have a higher risk of contracting not only HPV but also persistent HPV infection (Smith, 2010; Ahdieh et al., 2001), with confirmation of the diagnosis being beyond the scope of this study. This finding also supports previous literature (Moodley & Mould, 2005) that highlights the need for appropriate cervical screening programmes in South Africa.

In terms of marital status, as per the previous chapter, the results showed that HIV-infected women were more likely to be unmarried. One of the major risk factors identified for

contracting genital HPV is risky sexual behaviour such as having multiple sex partners (Burchell, Winer, de Sanjos & Franco, 2006; Koutsky, 1997). In addition to HIV, women also have to worry about contracting the HPV infection. This result further highlights the dire need for prevention programmes including condom negotiation (Seutlwadi & Peltzer, 2013) and gender empowerment strategies (Romero et al., 2006).

5.3.2 Long-term complications of HIV-infected and HIV non-infected women post hysterectomy

Long-term medical complications in women post hysterectomy have been highlighted in international literature (Clarke-Pearson & Geller, 2013) with less focus placed on the postoperative QoL. Specific complications negatively impacting the postoperative QoL need to be addressed to provide comprehensive care. The results from the present study showed that the majority of women could not perform vigorous activities (n=87; 91.6%), while 28 (29.5%) participants still struggled with bending, kneeling or stooping at the six-month time point, to which undergoing an abdominal hysterectomy was a predisposing factor (p=0.000). Patients undergoing an abdominal hysterectomy are known to require a longer recovery time compared to patients who undergo the vaginal or laparoscopic procedure (Nieboer et al., 2009). A recent study using the SF-36 health questionnaire had similar findings, where there was a significant difference in the physical functioning scale, with patients who underwent an abdominal hysterectomy scored lower than patients who underwent a laparoscopic procedure (Nieboer, Hendriks, Bongers, Vierhout & Kluivers, 2012). While the results were consistent with literature (Neiboer et al., 2012; Neiboer et al., 2009; Yang et al., 2006), unlike the current study, previous studies did not state which specific items in the physical functioning scale were affected and required attention to improve the postoperative QoL of women.

Post-surgical recovery rate is patient-dependent (Yang et al., 2006) and returning to normal activities is what patients view as a successful surgical outcome (Neiboer et al., 2012). As the women in the present study were of middle age (mean age=47.19 years SD±10.38) the long recovery period could negatively affect their work and social setup, as returning as quickly as possible to normal activity is a major expectation for middle-aged women post hysterectomy (Ruta, Garratt & Russell, 1999). Women therefore need to be counselled prior to the hysterectomy about the possible impact on physical functioning, especially those women undergoing an abdominal hysterectomy (Yang et al., 2006). Despite there being a

dearth of literature detailing physiotherapy involvement in patients post hysterectomy, physiotherapists can play a role in teaching women correct ergonomics to prevent disruption at the wound site, and strengthening/retraining the supportive musculature in the area following the procedure, which will also assist with recovery and enable a quicker return to normal activity. However, the underlying reason(s) for the delay in physical function needs to be established. A possible reason could be pain, as it has been shown that persistent postoperative pain impacts on daily activities (Bransborg, Nikolajsen, Hansen, Kehlet & Jensen, 2007).

Persistent post-surgical pain is somewhat expected in patients following an amputation, thoracotomy, mastectomy and cardiac surgery (Recker & Perry, 2011; Kehlet, Jensen & Woolf, 2006), but it has only recently been recognised as clinically significant for a hysterectomy (Recker & Perry, 2011). Slightly less than half (n = 46; 48.5%) of the participants still experienced some degree of pain at the operation site at six-months. Predisposing factors noted were participants who underwent a sub-total hysterectomy, radical hysterectomy, total hysterectomy with bilateral salpingo-oophorectomy, or radical hysterectomy with pelvic lymphadenectomy (p=0.011) and participants who had an abdominal hysterectomy (p=0.000). Although abdominal hysterectomy has been associated with more acute postoperative pain (Johnson et al., 2005) these findings suggest the presence of chronic postoperative pain, about which data are scarce (Johansen, Romundstad, Nielsen, Schirmer & Stubhaug, 2012) despite it being a clinical problem (Kehlet et al., 2012).

A study in Denmark found at least 32% of women to have chronic pain one year following a hysterectomy, and while the type of procedure was not significantly associated with pain, there was a tendency for more patients who had an abdominal hysterectomy to complain of this problem (Brandsborg et al., 2007). The reason for the high figure in the current study could be attributed to the previous study being six months longer (Brandsborg et al., 2007). The authors also found no difference with regard to type of procedure (Brandsborg et al., 2007), but the type of procedure analysed was different to the ones in this study, bar the sub-total hysterectomy. The reasoning behind the type of hysterectomy being a risk factor in the present study could be due to the procedure being lengthier (Neiboer et al., 2009) and possibly more complicated, with the expectation of a subtotal hysterectomy. Theories around the topic of chronic pain that have been postulated include persistent inflammation, neuropathic pain (Recker & Perry, 2011), high preoperative pain levels, genetic and

psychological status (Brandsborg et al., 2007). Central sensitisation before or after the procedure is another potential risk factor, but further research is needed to determine exactly when this occurs (Brandsborg et al., 2007; Recker & Perry, 2011).

Although the reason for chronic pain still needs to be understood, multimodal pain control immediately post-surgery remains essential to prevent development of chronic pain (Recker & Perry). Transcutaneous electrical nerve stimulation (TENS) has received much attention as an adjunct and in some cases an alternative to pharmacological intervention in reducing pain (Bjersa & Andersson, 2014; Rakel & Frantz, 2003). It has been shown to be effective in assisting with pain reduction during mobilisation, as well as deep breathing exercises in patients following abdominal surgery (Rakel & Frantz, 2003). Research in this area is still inconclusive, but it is noted that even the smallest change in pain, albeit not statistically significant, is important (Bjersa & Andersson, 2014). Ergonomic education may also play a role, based on anecdotal experience, as patients often do not know how to support the wound site postoperatively, which could place it under strain. This combined with TENS may alleviate pain postoperatively, thus possibly preventing the pain from becoming chronic and may ultimately improve the patient's long-term physical function.

Incontinence is a possible long-term side-effect of a hysterectomy (Brown, Sawaya, Thom & Grady, 2000), as the operation may cause damage to the pelvic nerves and supporting structures (Gupta & Manyondab, 2006). Forty (42.1%) participants in the present study struggled with some degree of urinary incontinence at the six-month time point post hysterectomy, with no risk factors identified. There are no South African studies detailing the prevalence rates of urinary incontinence in women following a hysterectomy. While the results are similar to an international study where 42.38% of women presented with urinary incontinence following a hysterectomy, the demographic profiles of the study participants were different from the present study, with all those in the previous study being over 60 years old (Hsieh et al., 2011). In addition, that study did not specify the participants' number of years post hysterectomy (Hsieh et al., 2011). Despite the lack of national data, the figure for UI in the present study is high, considering the prevalence of urinary incontinence being estimated at 27.6% (Minassian, Drutz & Al-Badr, 2003).

Risk factors that have been identified for UI are patients who undergo laparoscopic procedures (Neiboer et al., 2009) and a radical hysterectomy (Brooks et al., 2009). However,

the risk of urinary tract injuries decreases as the surgeons' experience improves (Neiboer et al., 2009). Similar to previous studies (Hsieh et al., 2011; Altman et al., 2007), the present study found that the surgical route and type of hysterectomy did not impact on urinary incontinence. However, this could be due to the majority of participants having had an abdominal hysterectomy (n=80; 79.2%) and a total hysterectomy (n=82; 81.2%) respectively.

The results from this study as with previous studies (Hsieh et al., 2011; Altman et al., 2007) confirm that women do experience UI post hysterectomy, therefore medical personnel should expect the patient to experience some degree of urge, stress or mixed UI post-surgery (Altman et al., 2007; Gustafsson et al., 2006). It has been theorised that the damage to the distal branches of the pudendal nerves and inferior hypogastricplexa may affect the urethral sphincter mechanism (Gupta & Manyonda, 2006; Siddique, Gutman, Schon Ybarra, Rojas & Handa, 2006), while alterations in the pelvic floor anatomy may result in a lower pressure on the urinary bladder and hypermobility of the bladder neck (Gustafsson et al., 2006; DeLancey, 1992) resulting in stress urinary incontinence. In addition, iatrogenic injury to the autonomous plexa and innervation of the pelvic floor may cause innervation problems of the detrusor muscle, resulting in urge urinary incontinence (Gustafsson et al., 2006; van der Vaart, van der Bom, van der Leeuw, de Roovers & Heintz, 2002). Physiotherapists are trained to treat all subtypes of urinary incontinence (Mantle et al., 2004), which could facilitate the recovery process for women experiencing UI post hysterectomy. The use of pelvic-floor training, vaginal cones, biofeedback devices and behavioural therapy has shown improvement of urinary incontinence among women (Pereira, Melo, Correia & Driusso, 2013; Rovner & Wein 2004) but physiotherapists need to be involved and included in the patient care early on.

Another interesting finding from the study was that eight (8.5%) participants still experienced swelling in their lower limbs, with having undergone an abdominal hysterectomy being a risk factor (p=0.048). Although this is a relatively small number, lower limb swelling still persisted for six-months' post-surgery, therefore making it a chronic problem. The findings are contrary to the norm, as lymphedema is a condition mostly found in patients following a radical hysterectomy with lymphadenectomy (Ware & van Nagell, 2010). As only one participant underwent that operation, the findings could be interpreted as pre-existing or new medical conditions perhaps being the cause, indicating the need for the patient to be referred for further investigation. If it is diagnosed as chronic lymphedema, diagnosis and

symptomatic control is a vital part of management (Tiwari, Myint & Hamilton, 2006). While the most effective management for lymphedema is complex decongestive therapy, the condition is often not given the necessary importance (Tiwari et al., 2006) resulting in the patient not being referred appropriately.

In terms of LBP, in this study, 28 (32.7%) participants still experienced LBP with HIV non-infected participants (p=0.000) and participants' ≤ 60 years (p=0.001) being more susceptible after the procedure. The HIV non-infected participants in this study were significantly older, which could have placed them at a higher risk for LBP compared to the infected group. Women younger than 60 may be required to resume their normal daily responsibilities at home or work quicker post-surgery, which could result in an increase in LBP. While degenerative changes in the lower back are a part of aging (Adams & Roughley, 2006) these also result from impaired ovarian function after menopause in women who have had a hysterectomy (Heliövaara-peippo et al., 2009; Wijnhoven, de Vet, Smit & Picavet, 2006). This implies that these women may either experience degenerative changes earlier than expected or accelerate the current process. The sudden onset of menopause following the hysterectomy also has other consequences: psychological effects on women such as tiredness, anxiety and depression (Heliövaara-peippo et al., 2009; Ceausu, Shakir, Lidfeldt & Nerbrand, 2006).

This study showed that a large number of participants had some degree of post-surgery fatigue (range: 55.5% – 100 %). In addition, 48 (50.5%) participants felt some degree of depression at the sixth month. These results are similar to previous research in this area (Heliövaara-peippo et al., 2009; Ceausu et al., 2006). Reasons for these postoperative symptoms remain unclear although a variety of reasons such as anaemia due to blood loss, psychosocial, and metabolic and hormonal changes have been postulated (Ceausu et al., 2006; DeCherney et al., 2002). Postoperative fatigue lasts twice as long as pain, and occurs more frequently (DeCherney et al., 2002). The present study also found participants who underwent a sub-total hysterectomy, radical hysterectomy, total hysterectomy with bilateral salpingo-oophorectomy or radical hysterectomy with pelvic lymphadenectomy, to be more at risk. The reason for this finding could be that, with the exception of the sub-total hysterectomy, these procedures required the removal of the ovaries and were more complicated, and could have resulted in more intra and postoperative blood loss, which ties into the hormonal and anaemia theories (Ceausu et al., 2006; DeCherney et al., 2002).

Management strategies vary from psychological, pharmacological to exercise (Cooney et al., 2013; Penedo & Dahn, 2005), with the latter being favoured, as it does not have the side effects of pharmacological therapies and empowers individuals to take control over their health.

The long-term complications mentioned above were problems with physical functioning (vigorous activities, bending, kneeling and stooping), postoperative pain, urinary incontinence, lower limb swelling, lower back pain, postoperative fatigue and depression. Physiotherapists are trained at an undergraduate and post-graduate level to manage apects of these patients postoperatively, and this could aid in recovery, which will ultimately improve their QoL post-surgery. Furthermore, a patient's QoL post hysterectomy is now becoming viewed as a primary rather than a secondary outcome (Neiboer et al., 2012).

5.3.3 Quality of life among HIV-infected and non-infected women post hysterectomy

Patients base the success of the surgery on their postoperative QoL, which is why it has become a necessary outcome of measurement for research (Neiboer et al., 2012). Consistent with previous studies (Neiboer et al., 2012; Lee, Wen, Lin. S & Lin. H, 2009; Kluivers et al., 2007; Yang et al., 2006), the physical health of the patient was more affected than the mental health, both of which improved over time. HIV-infected women also scored lower in only two subsets in the physical health category. This implies that the postoperative QoL of women post hysterectomy is dependent on factors other than their HIV status, provided of course that the viral count is not too low. What is also important, which was accomplished in this study compared to the previous studies (Neiboer et al., 2012; Lee et al., 2009; Kluivers et al., 2007; Yang et al., 2006) was that the factors accociated with the reduced QoL were highlighted. This is essential, as it will provide practitioners with insight into what to specifically address to improve the QoL of women post hysterectomy.

Women undergoing a hysterectomy are more likely to develop urge UI (van de Vaart et al., 2002), which has a greater impact on their QoL as it is harder to control (Segedi et al., 2011). Although the type of incontinence was not identified in this study, the results showed that UI and a low QoL were associated. Women who underwent an abdominal hysterectomy were more impaired in terms of their QoL than any other operative group. This could result from the reduced functional capability due to the prolonged recovery required for women

undergoing an abdominal hysterectomy (Nieboer et al., 2009). Addressing both the functional limitation and the UI would assist patients to have a better QoL postoperatively, which can be achieved with the correct management.

While age did not feature specifically as a predisposing factor in the long-term complications, in the reported health transition question (Question 2) the mean decreased with an increase in age, indicating that the older the participant, the poorer was the view they had on their health. Participants who underwent an abdominal surgery also held this view. The poor general health perception could result from the physical limitations inflicted on the patients, as the surgery and experiencing UI could have interrupted their social life and might not have been what they expected (Lee et al., 2009). Older participants and abdominal hysterectomy participants may also take longer to heal, depending on their postoperative medical status (Young & McNaught, 2011; Lee et al., 2009), which is also a reason for their poorer outlook on their health.

5.3.4 Health-seeking behaviour of HIV-infected and non-infected women post hysterectomy

Findings from this study were similar to the results from the previous chapter, where none of the hysterectomy participants sought any medical attention or advice. High transportation costs were mentioned as a barrier to seeking health care; but the main reasons participants in this study did not seek health care were that they believed that they would be given analgesics or that their problems would spontaneously resolve over time. Poor utilisation of health care facilities has been documented among South African women out of choice (Lopes Ibanez-Gonzalez & Norris, 2013). While this concept needs to be explored, a possible reason is poor communication or education on the importance of postoperative care by attending health care professionals. Providing the patient with education about the value of preventative care, as well as establishing a collaborative relationship between the patient and the health care professional, is seen as a facilitator for patients to seek care (Green, Johnson & Yarborough, 2014). This study highlights the importance of pre- and postoperative counselling with the patient.

5.4 CONCLUSION

The finding from this section highlighted that different areas need to be addressed to ensure holistic management, which is important for the development of clinical guidelines. Although the physical aspect (biological) was more affected than emotional (psychological) in this group of participants, the results showed that fatigue and depression need to be addressed in patients post hysterectomy in order to render holistic treatment. Pre- and postoperative counselling and educating the patient will also add to holistic management strategy. The long-term complications highlighted in this section were physical functioning, pain at the operative site, swelling, LBP, urinary incontinence, postoperative fatigue and depression. These complications may be treated or prevented with early physiotherapy intervention, and physiotherapists can assist with preoperative education and speeding up a patient's recovery, thus enabling a quicker return to normal and resulting in an improved QoL.

The next phase of the study aims to determine current treatment strategies and complications being addressed by physiotherapists treating women post caesarean section and hysterectomy. The complications highlighted in this chapter and the previous chapter will provide a platform for the researcher to evaluate whether physiotherapists are addressing and identifying problems in this cohort of patients. The results will assist in adding to the richness of the study, as any additional complications found in the subsequent chapter will contribute towards the clinical guideline development.

CHAPTER 6. TREATMENT STRATEGIES AND COMPLICATIONS ADDRESSED BY PHYSIOTHERAPISTS IN HIV-INFECTED AND NON-INFECTED WOMEN POST CAESAREAN SECTION DELIVERY AND HYSTERECTOMY

6.1 INTRODUCTION

This chapter addresses Phase 2, which consists of Objective 4 and 5, and details the current treatment strategies and complications addressed by physiotherapists treating HIV-infected and non-infected women post caesarean section delivery (CSD) and hysterectomy. The results, discussion and conclusion are presented in this chapter.

6.2 RESULTS

This section is subdivided into the following: socio-demographics of participants, physiotherapy management and complications treated in patient's post caesarean section delivery, and physiotherapy management and complications treated in patient's post hysterectomy.

6.2.1 Socio-demographics of participants

The total number of physiotherapists approached to participate in the study was 37, with a response rate of 84% (N=31). The mean age of the participants was 32 years (SD±4.65). There were more women (n=28) than men (n=3), with the majority being Indian (n=26; 77%) (Table 6.1). Of the participants, 45% (n=14) had 3-7 years of experience, 26% (n=8) had 8–12 years of experience, and 29% (n=9) had 13–19 years of experience in physiotherapy. In terms of postgraduate education, 96.8% (n=30) did not have any postgraduate degree(s) in physiotherapy, and those who did (n=1; 3%) obtained it in Sports Medicine (Table 6.1).

Table 6.1: Socio-demographic profile of participants

Socio-demographic Information	Categories	Total N =31 (%)
Age	Mean Standard deviation	32 ±4.65
Race	African Coloured (mixed ancestry) Indian White	5 (16.1%) 0 (0%) 24 (77.4%) 2 (6.5%)
Gender	Female Male	28 (90.3%) 3 (9.7%)
Postgraduate qualification	Yes No	1 (3.2%) 30 (96.8%)

6.2.2 Physiotherapy management and complications treated in patients' post caesarean section delivery

Of the 31 participants, 68% (n=21) had treated post-CSD patients, 6% (n=2) were unsure if they had treated post-CSD patients, and 26% (n=8) had not treated post-CSD patients in the preceding year. The self-reported number of patients treated following CSD by the participants varied, with a mean of 8.42 and an interquartile range of 15. The most common reason reported by the participants for not having treated a CSD patient in the past year was that they had not been on an obstetric and gynaecology rotation (n=9; 29%), with other reasons being presented in Figure 6.1.

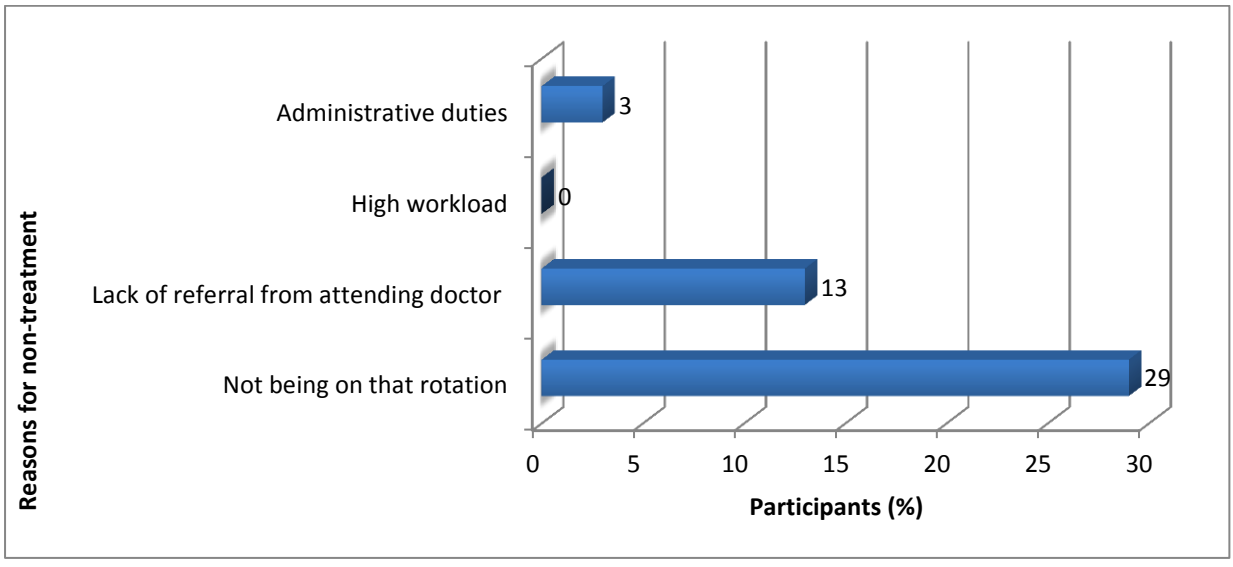


Figure 6.1: Reasons for not treating patients post-CSD (n=12)

The mean number of physiotherapy treatment sessions rendered for each patient was 3.52 (SD±1.09), with the average treatment time being 15–30 minutes (67.7%; n=21). The year of undergraduate completion did not affect the average time spent treating a patient post-CSD (p=0.35). The average treatment time spent with a patient was similar, irrespective of whether or not the participant treated a patient post-CSD (p=0.38) in the past year. Various modalities were selected by physiotherapists for treating patients post-CSD (Figure 6.2), with all of the participants (N=31) selecting mobilisation as a treatment technique. For this study, the term "mobilisation" is defined as "the process of re-establishing the ability to move between postures (for example sit to stand), maintain an upright posture, and to ambulate with increasing levels of complexity (speed, changes of direction, dual and multi-tasking)" as per the NICE clinical guideline 124 (2011). Deep breathing exercises (n=29; 94%) and education (n=29; 94%) were the next most commonly selected modalities. Other techniques reported by the participants included: "circulatory exercises and breathing exercises" (n=1; 3%), "coughing techniques" (n=1; 3%) and "infra-red lamp for post caesarean section hematoma" (n=1; 3%).

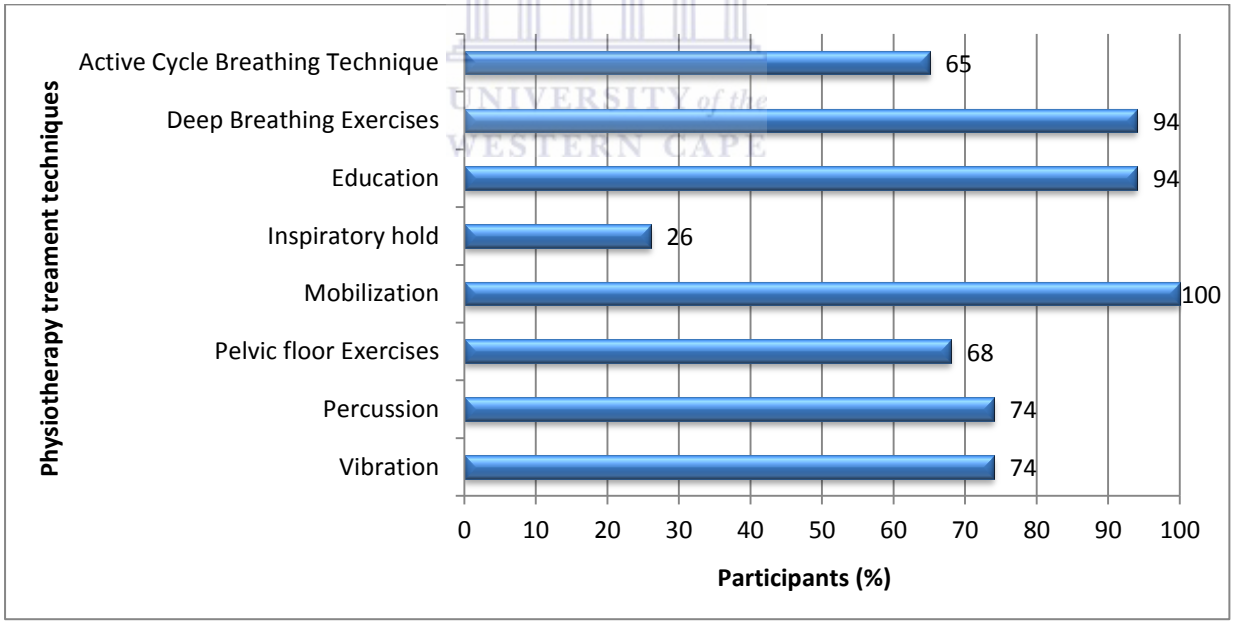


Figure 6.2: Choice of physiotherapy treatment techniques for patients post-CSD (N=31)

Treatment modalities selected by the participants were similar regardless of when the participants graduated (Table 6.2). Percussion was the only modality selected most

frequently (p=0.01) as a treatment choice by those who had treated post-CSD patients in the preceding year and those who had not (Table 6.2).

Table 6.2: Modality selection vs year of graduation and treatment of women post-CSD

Modality Selection	Year of graduation	Have you treated a patient post-CSD
Percussion	p = 0.80	p = 0.01
Vibration	p = 0.80	p = 0.10
Deep Breathing Exercises	p = 0.29	p = 0.48
Inspiratory Hold	p = 0.76	p = 0.63
Active Cycle Breathing Technique	p = 0.43	p = 0.10
Pelvic Floor Exercises	p = 0.10	p = 0.48
Education	p = 0.13	p = 0.17

Two-tailed Fisher's exact test

Forty-five per cent (n=14) of physiotherapists mentioned that they had treated other complications post-CSD, with respiratory complications being the most common (n=5; 16%) (Figure 6.3)

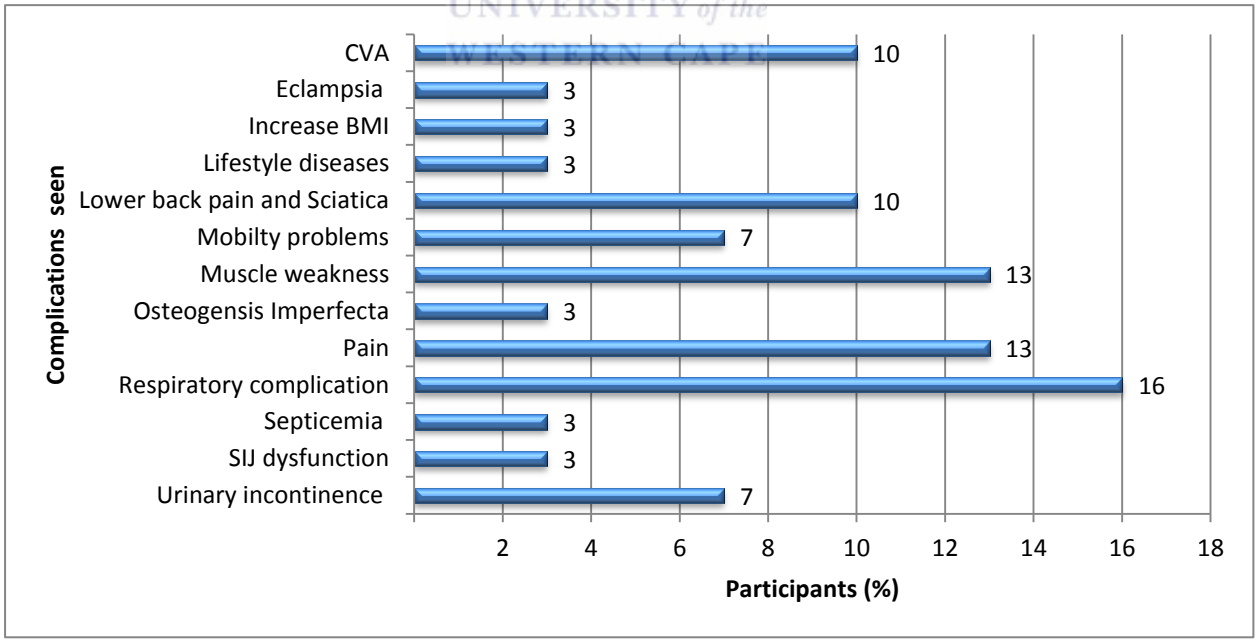


Figure 6.3: Complications seen by participants (n=14)

In terms of varying treatment according to the HIV status of the patient, the majority of participants replied that they were unsure (n=14; 45%), while 42% (n-13) replied that they would not vary their treatment. Thirteen per cent (n=4) stated that they would vary their treatment, the reasons stated being that HIV-infected patients are more prone to respiratory complications (n=3; 10%), and that HIV-infected patients are more susceptible to postoperative complications (n=1; 3%).

The results indicated that 13% (n=4) of participants ordered surgical devices for their patients, the most common device being walking frames and elbow crutches (n=2; 6%), followed by a lumbar corset (n=1; 3%) and a walking stick (n=1; 3%). Of the 31 participants who had and had not treated post-CSD patients in the past year, 19.4% (n=6) referred them to other members of the multidisciplinary team, including a clinical psychologist (n=1; 3%), social worker (n=1; 3%), dietician (n=1; 3%), doctor (n=1; 3%) and occupational therapist (n=2; 3%). As indicated in Figure 6.4, advice on discharge was given by 90.3% (n=28) of participants, with precautions following a caesarean section being the most common discharge advice to patients (n=10; 32%).

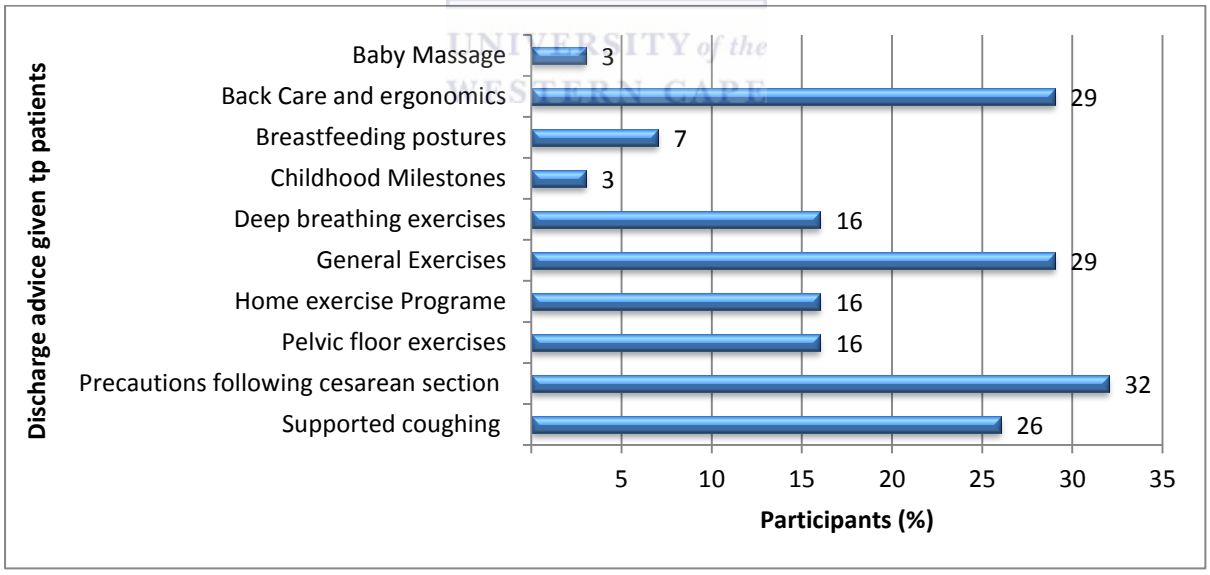


Figure 6.4: Discharge advice given to women post-CSD (n=27)

6.2.3 Physiotherapy management and complications treated in patients post hysterectomy

Of the 31 participants, 55% (n=17) had treated post hysterectomy patients, 3% (n=1) participant was unsure if s/he had treated post hysterectomy patients, and 42% (n=13) had not treated post hysterectomy patients in that year. Table 6.3 shows that the self-reported number of patients treated after a hysterectomy varied greatly between the participants, with most participants treating patients post total hysterectomy (mean = 3.58; interquartile range = 7).

Table 6.3: Number of hysterectomy patients treated in one year

Type of operation	Mean	Minimum – maximum range	Interquartile range
Radical hysterectomy	0.81	0 – 10	0
Total hysterectomy	3.58	0 – 15	7
Vaginal hysterectomy	0.97	0 – 8	1

The most common reason reported for not having treated a hysterectomy patient in the past year was that they had not been on an obstetric and gynaecology rotation (29%; n=9), with other reasons being presented in Figure 6.5.

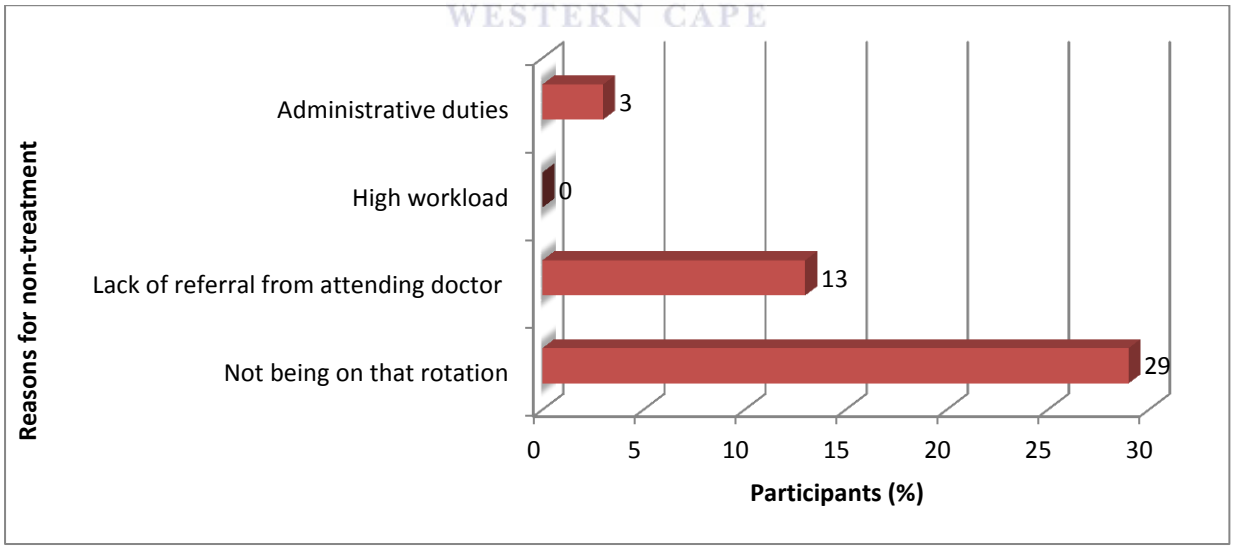


Figure 6.5: Reasons for not treating patients post hysterectomy (n=15)

The mean number of physiotherapy treatment sessions rendered for each patient was 4.13 (SD±1.45), with the majority selecting a treatment time of 15–30 minutes (77.4%; n=24). The average time spent with a patient was not affected by the year of undergraduate completion

(p=0.82) or whether participants treated a post hysterectomy patient in the past year (p=0.23). The results show that majority of the participants (97%; n=30) selected mobilisation as a treatment technique for post hysterectomy patients, which was closely followed by deep breathing exercises (94%; n=29) (Figure 5.6). Other modalities selected are described in Figure 6.6, with one participant (3%) stating "coughing technique" under the "other techniques" category.

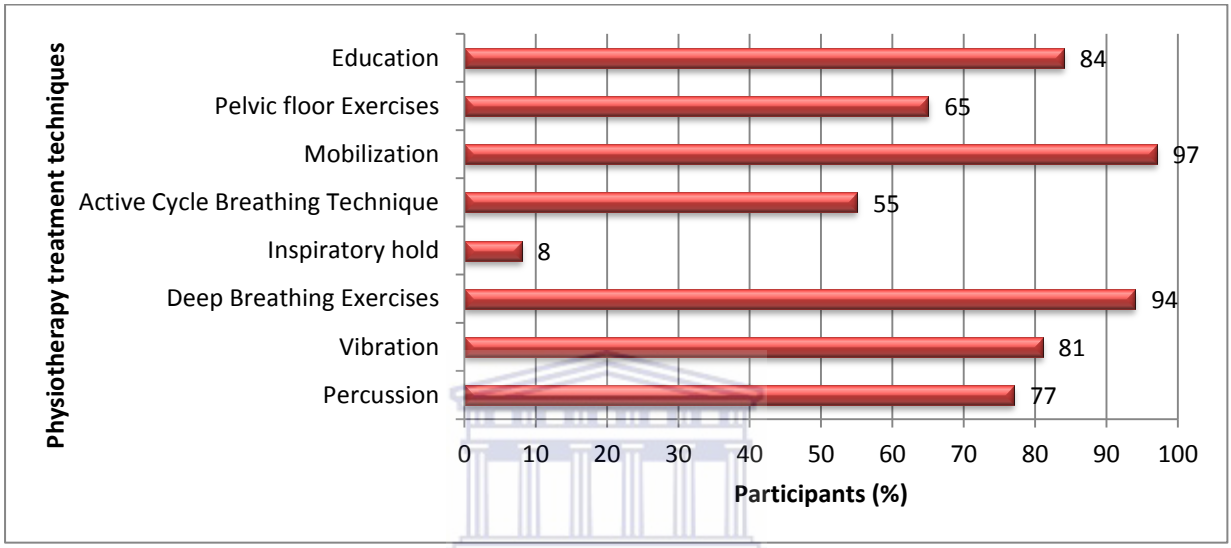


Figure 6.6: Choice of physiotherapy treatment techniques for patients post hysterectomy

Table 6.4 shows that there was a statistical difference between the year of graduation and percussion (p=0.02). This indicated that the "newer graduates" were more inclined to select percussion as a treatment technique. Furthermore, there was a significant difference noted between participants who treated patients in the past year and those who did not, with regard to selecting percussion (0.001) and vibration (0.004) as treatment techniques. Both the treatment modalities were more likely to be selected by participants who had treated hysterectomy patients in the preceding year.

Table 6.4: Modality selection vs year of graduation and treatment of women post hysterectomy

Modality Selection	Year of graduation	Have you treated a patient post hysterectomy
Percussion	p = 0.02	p = 0.001
Vibration	p = 0.08	p = 0.004
Deep Breathing Exercises	p = 0.13	p = 0.23
Inspiratory Hold	p = 1.00	p = 0.096
Active Cycle Breathing Technique	p = 0.80	p = 0.14
Pelvic Floor Exercises	p = 0.56	p = 0.32
Education	p = 0.55	p = 0.68

Two-tailed Fisher's exact test

The results showed that 42% (n=13) of the participants replied that they would not vary their treatment technique according to the HIV status of the patient, 39% (n=12) replied that they were unsure, and 19% (n=6) replied that they would. The most common reason for varying treatment stated by participants was that HIV-infected patients were more prone to respiratory infections n=5 (16%), with one participant (3%) stating that HIV non-infected patients required fewer postoperative precautions.

With regard to the operative procedure, the results showed that minority of the participants (n=7; 22%) stated that they would vary their management technique according to the type of hysterectomy, with the majority being either unsure (n=12; 39%) or indicating that their management would not vary according to the type of hysterectomy (n=12; 39%). The most common reason for the difference in management (n=3; 10%) was that the vaginal hysterectomy technique is simpler and therefore requires fewer precautions, with weakness of the adductor muscles resulting after the operation (Figure 6.7).

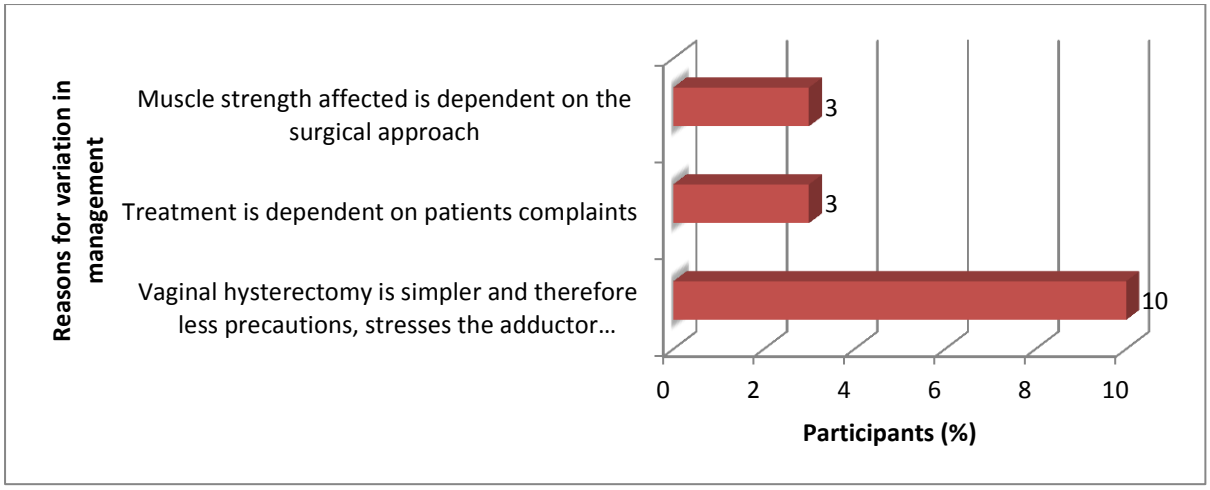


Figure 6.7: Reasons for variation in physiotherapy management in the type of hysterectomy (n=5)

With regards to the surgery, the majority of participants (n=18; 58%) stated that their management would be dependent on the surgical technique, while 6% (n=2) were unsure and 36% (n=11) said no. The most common reason for the difference in management was due to participants feeling that patients who had an abdominal hysterectomy would require more wound support and care with mobilisation (n=16; 52%) (Figure 6.8).

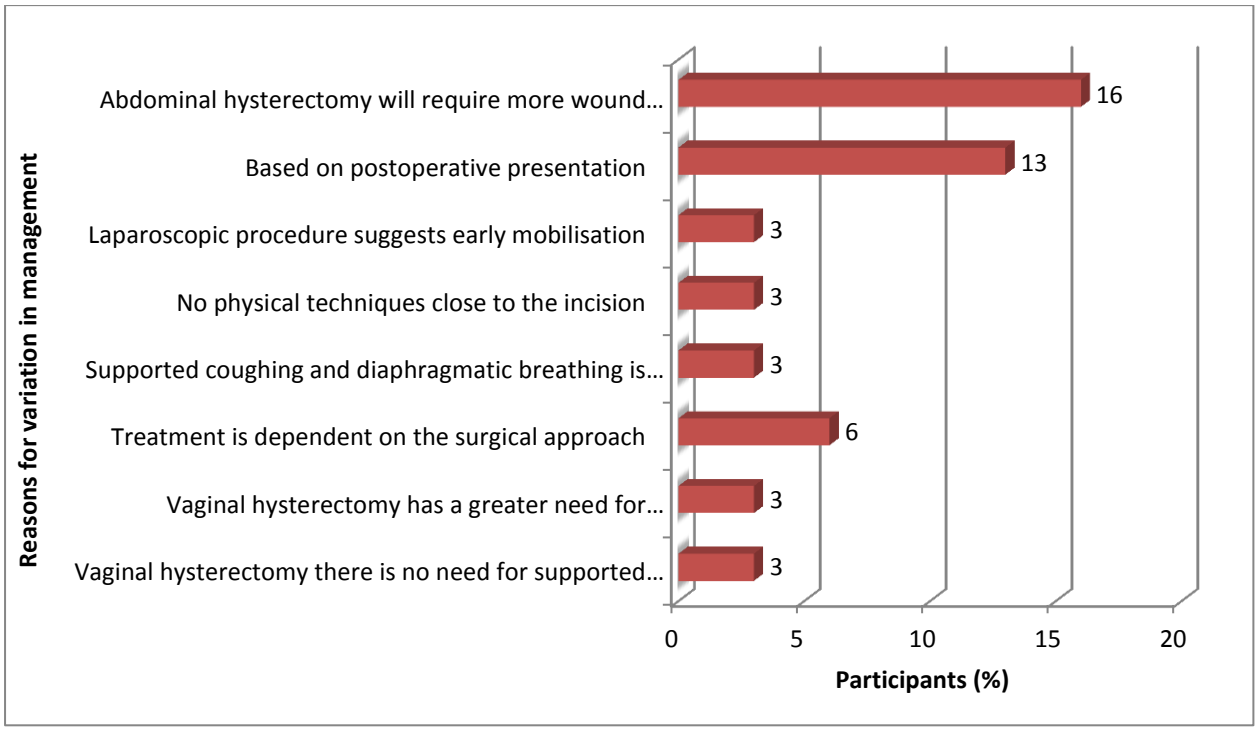


Figure 6.8: Reasons for variation in physiotherapy management in the type of surgery (n=16).

Figure 6.9 shows that 39% (n=12) of the participants treated other complications post hysterectomy, with chest complications being the most common (n=6; 19%).

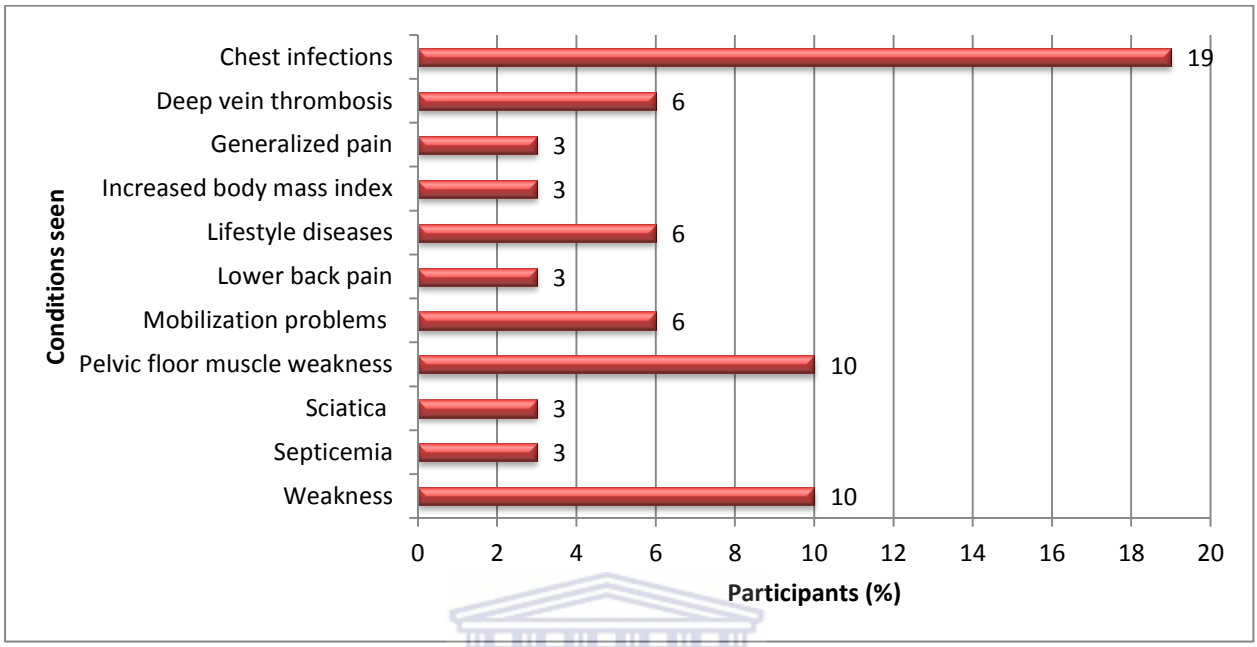


Figure 6.9: Complications treated by participants post hysterectomy (n=12)

Ten per cent (n=3) of participants had ordered assistive devices for their patients, which included walking frames (n=2; 6%) and a corset (n=1; 3%). The results show that 97% (n=30) of participants did not refer patients to other members of the multidisciplinary team. The one participant who did, referred the patient to a dietician, social worker and psychologist. Figure 6.10 demonstrates that advice on discharge was given by 84% (n=26) of participants, with deep breathing exercises being most common discharge advice (n=7; 23%).

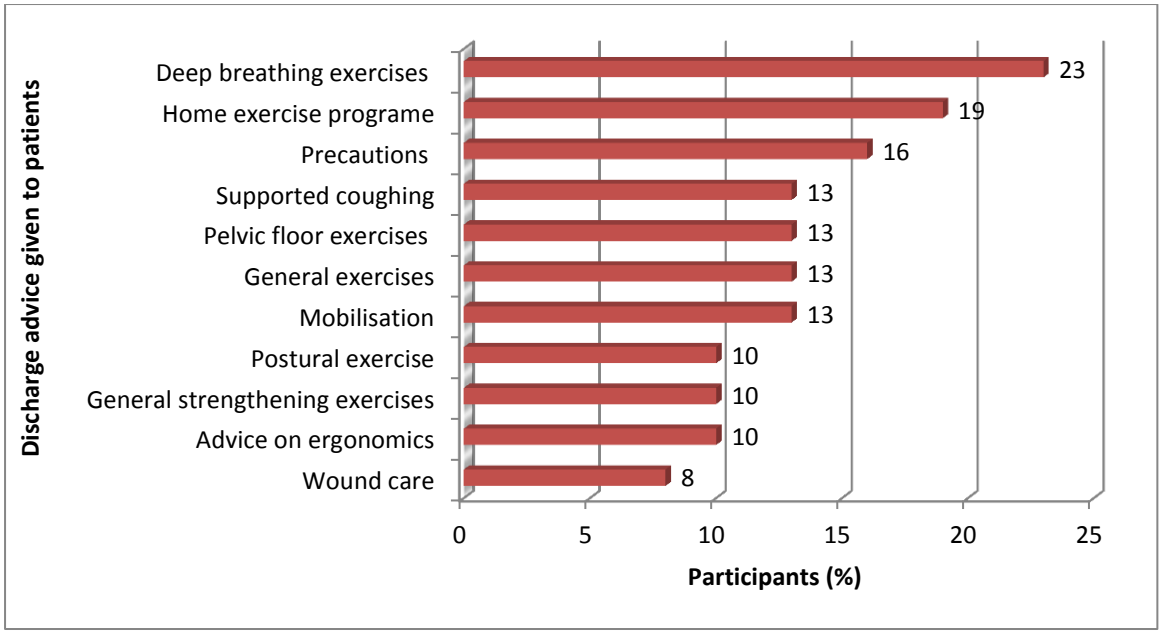


Figure 6.10: Discharge advice given to women post hysterectomy (n=26)

6.3 DISCUSSION

The purpose of this phase of the study was to identify the current treatment strategies and complications being used by physiotherapists in four public hospitals in KZN, for patients post-CSD and hysterectomy surgery, as indicated by Objectives 4 and 5. The results from the socio-demographic section of the study demonstrated that the gender was skewed in favour of females (90%), which is in keeping with previous research that shows that physiotherapy is a female-dominated profession (Hammond, 2009). In addition, anecdotal information received from the Health Professionals Council of South Africa showed that as of 8 January 2014, 84% of the active registered professionals in physiotherapy were women (Health Professionals Council of South Africa, personal communication, March 10, 2014).

The year of qualification and whether participants treated patients post-CSD and post hysterectomy did not affect most of the physiotherapy management strategies selected by participants (Table 6.2 and Table 6.4). It can therefore be concluded that physiotherapists are not modifying their management strategies to meet the specialised needs of obstetric and gynaecology patients, but are using standard treatment routines. This may be due to the fact that none of the participants had received any specialised postgraduate training in managing

women post-obstetric and gynecological surgery. It has been reported that with a higher level of education or performing research-related assignments, the estimated ability to perform database searches is higher, as well as the confidence to critically analyse articles (Nilsagard & Lohse, 2010), which may also be a reason for the lack of modification in this study. The results also suggest that physiotherapists may be relying on their undergraduate knowledge, and have not changed their management strategies to include recent evidence-based research. Globally, physiotherapists are required to keep abreast of new information, and to incorporate such research into their clinical practice (French & Dowds, 2008). However, a paucity of research in certain areas (Dannapfel, Peolsson & Nilsen, 2013), limited time, restricted access to journals, and lack of research skills in finding and evaluating articles, are perceived barriers to evidence-based practice (Iles & Davidson, 2006).

Previous research has also stated that publicly employed physiotherapists seldom perform database searches, read and critically appraise scientific literature, and use evidence-based guidelines (Nilsagard & Lohse, 2010). Although continuing professional development courses are mandatory in South Africa, there is little evidence of the effect of these courses on physiotherapists' knowledge, and more importantly, on patient outcomes (French & Dowds, 2008). The results of this study are similar to a review by Schreiber and Stern (2005), which suggested that physiotherapy management was not based on research, but rather on anecdotal and undergraduate information. Furthermore, a study by Stevenson et al. (2004) showed that although physiotherapists were in favour of evidence-based research, they were reluctant to change their practice. An effective way forward to encourage evidence-based practice would be to incorporate such practice into clinical training (Coomarasamy & Khan, 2005), thus guiding the therapist to pre-appraised literature and online resources (Iles & Davidson, 2006).

Anecdotal information from the hospitals used in the present study indicates that some perform over 2000 caesarean sections out of a total of 8400 births, and 240 hysterectomies per annum. In terms of caesarean sections, the study by van Ham et al., (1997) indicated that 36% of CSD women have complications and could require physiotherapy treatment. The low mean number of patients (mean=5) being treated by the participants demonstrated a low level of referral from obstetricians. There is evidence that physiotherapy can successfully treat postpartum problems such as pelvic floor dysfunction and lower back pain (Britnell et al., 2005), and that in-hospital prophylactic treatment should also be given. What is noteworthy

is that the main reason for not having treated a patient post-CSD was "not having been on that particular clinical rotation", with only one participant replying "lack of referral from a doctor" (Figure 6.1). This indicates that obstetricians and gynaecologists are only referring patients who they deem necessary for physiotherapy. This is supported in the study by the mean number (mean=3.52; SD=±1.09) of treatment sessions rendered for a patient post-CSD. This is a high number of physiotherapy treatment sessions for uncomplicated post-CSD patients, as they are considered for discharge on day three postoperatively (SA Department of Health, 2007a).

The other reason for non-referral could be that uncomplicated post-CSD patients who would benefit from prophylactic treatment are not being referred for physiotherapy because doctors are unaware of the services physiotherapists render. In addition, participants in this study selected respiratory modalities (Figure 5.2) as part of their management strategy for patients post-CSD. Although there is minimal evidence in the literature reporting on respiratory complications following an uncomplicated pfannenstiel incision for a caesarean section, participants stated that respiratory complications (16%) were one of the main problems they addressed (Figure 5.3). This was followed by pain (13%) and muscle weakness (13%), while three participants mentioned lower back pain and sciatica, and two mentioned treating urinary incontinence as an added complication. Furthermore, participants stated that their treatment would vary depending on the HIV status of the patient because HIV-infected women were more susceptible to respiratory infections. This is contrary to the findings of this study, as none of the HIV-infected women who participated in this study developed postoperative respiratory complications. However, complications in HIV-infected women post-CSD are viral load dependent (Moodliar et al., 2007, Panburana et al., 2003) or the referred patients may have had a pre-existing respiratory condition resulting from the virus (Moodley & Pattinson, 2012). The results therefore suggest that obstetricians at these hospitals mainly refer patients with respiratory complications for physiotherapy, indicating misconceptions regarding the services rendered by physiotherapists for patients post-CSD.

A similar scenario was noted with patients post hysterectomy, with the mean being less than one for two of the procedures, despite the high number of patients who undergo the procedure per annum. International data shows that infectious complications range from 10.5% for abdominal hysterectomy to 13% for vaginal hysterectomy, and 9% for laparoscopic hysterectomy (Clarke-Pearson & Geller, 2013), with complications in a South

African setting having been identified (Butt et al., 2012; Chrysostomou, 2008) which can be treated, and in some instances prevented, by physiotherapists (Pereira et al., 2013; Rovner & Wein 2004; Rakel & Frantz, 2003). The average length of stay in hospital following a hysterectomy is four days (Butt et al., 2012; Garry et al., 2004), with physiotherapy treatment usually commencing day one postoperatively. The participants stated that mean treatment sessions were 4 (SD±1.45), which is slightly higher than the norm if the participant is treating the patient daily.

Percussion and vibration were more likely to be selected by the participants who did treat post hysterectomy patients, with chest infections also being selected as the most common complication seen. Respiratory physiotherapy, specifically percussion and vibration, were used to facilitate mucus clearance (Palmer & Sellick, 1953). These results suggest that gynaecologists, like the obstetricians, are referring patients specifically with respiratory complications for physiotherapy, indicating that not all patients are referred to physiotherapists. The results from this study further confirmed this theory, as the participants who stated that they would vary their treatment indicated that HIV-infected women were more susceptible to respiratory complications, which is contrary to the results found in this study.

Despite the role and influence of physiotherapy in obstetric and gynaecological conditions having been established more than five decades ago (Mantle et al. 2004), the results from this study suggest that obstetricians and gynecologists may still be are unaware of the role of physiotherapists, either in postoperative patients or in the services rendered. This could also be the reason why physiotherapists are only part of the postoperative referral system in the NICE guidelines for respiratory complications (NICE, 2012). Freeman, Miller & Ross (2000) have advised that in order for patients to be referred to other members of the multidisciplinary team, health care professionals need to understand each other's role and contribution to patient care. Participants in this study indicated that they did refer patients to other members in the multidisciplinary team, with only one providing a reason for referral which was "to doctors, patient had severe abdominal pain–swab was left in the patient". This demonstrates the importance of communication and understanding each other's role when working as part of a team, which appears to be lacking in obstetricians and gynaecologists.

Participants in the study stated that they would change their treatment depending on the surgical approach for the hysterectomy, but not on the type of hysterectomy. The results from the open-ended question, however, suggested they there was slight confusion between the two, with three participants (the majority) thinking that vaginal hysterectomy was a type of hysterectomy rather than a surgical route. This further highlights the need for training in this area, as participants were unaware of the differences in the procedures, and that complications are dependent on type and surgical route (Clarke-Pearson & Geller, 2013; Ware & van Nagell, 2010; Neiboer et al., 2009). Furthermore, the majority of participants were unsure whether or not to vary their management style depending on the HIV status of the patient, for patients' post-CSD and hysterectomy.

If physiotherapists are not properly trained to manage obstetric and gynecological patients, they may fail to recognise problems, which could be a major problem, and could affect the manner in which the profession is viewed. Considering that in South Africa, physiotherapists have first-line practitioner status, the practitioners need to be competent problem solvers (C. Higgs, Neubauer & J. Higgs, 1999) who are able to interact with different clients and make decisions in various settings (Higgs & Hunt, 1999). However, in order to achieve this, they need to be equipped with the correct information. In a recent study on research priorities in the United Kingdom as selected by physiotherapists, women's health did not feature on the panel list (Rankin, Rushton, Olver & Moore, 2012) despite the global attention the area is receiving (UN, 2013). This emphasises the need for research and for attention to be drawn to this neglected area of physiotherapy.

Advice on discharge was given to most of the patients post-CSD and hysterectomy, but with respect to caesarean sections, only five (16%) participants specified pelvic floor exercises, and nine (29%) specified back care and ergonomics as a home programme. The literature indicates that in terms of potential problems following a CSD, urinary incontinence was widespread (Chin et al., 2005) and lower back pain was frequently under-reported (Wang et al, 2004; Mogren & Pohjanen, 2005). Studies have shown the benefit of a specific home exercise programme for urinary incontinence (Haddow, Watts & Robertson, 2005) and non–specific lower back pain (Kuukkanen, Malkia, Kautiainen & Pohjolainen, 2007) in postpartum patients. Similarly, for patients post hysterectomy, the majority of participants (n=7; 23%) gave breathing exercises as a home programme, with four participants (13%) specifying pelvic floor advice, and three (10%) specific ergonomic advice (Figure 6.10).

These results demonstrate there maybe a need for specific training in this area as complications based on results from this study (Chapters 4 and 5) and previous studies (Butt et al., 2012; Clarke-Pearson & Geller, 2013; Neiboer et al., 2012) are not being addressed by physiotherapists.

6.4 CONCLUSION

The results from this study reveal that physiotherapists are mainly using respiratory techniques to manage patients post-CSD and hysterectomy, with the main complications being respiratory problems. This emphasises that the physiotherapy profession needs to educate obstetricians and gynaecologists about the role and effectiveness of physiotherapy techniques in patients post-CSD and post hysterectomy. Scholes and Vaughan (2002) have stated that inter-professional education is thought to improve collaboration between the members of the multidisciplinary team, which will result in more effective and efficient teamwork. This could include inter-professional education workshops on the role of physiotherapy within the multidisciplinary team in treating women post-CSD and hysterectomy, to increase patient referrals.

The lack of advice on pelvic floor and lower back exercises as prophylactic treatment in postpartum home programmes suggests a gap in awareness of physiotherapists of the prevalence and types of complications that may arise post-CSD. Similarly, the responses in the post hysterectomy section revealed gaps in knowledge pertaining to operative procedure and complications. Physiotherapy courses that provide additional training, using evidence-based practice management practices for caesarean section and hysterectomy patients, would enable practitioners to provide more appropriate treatment. This is a fairly new area of research, especially in South Africa, and evidence-based research is therefore essential to improve the role and view of the physiotherapy profession.

The next chapter will consist of a systematic review which will consider the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy. It will also provide international and national evidence on the physiotherapy management to be utilised to develop a clinical guideline.

CHAPTER 7. CURRENT PHYSIOTHERAPY TREATMENT TECHNIQUES ACCORDING TO THE LITERATURE

7.1 INTRODUCTION

Phase 3 of the study addressed Objectives 5 and 6. This chapter will assist in determining the current physiotherapy management strategies, according to the literature, for complication(s) and/or potential complication(s) of women following caesarean section delivery and hysterectomy (Objective 5). The results, discussion and conclusion are presented in this chapter.

7.2 RESULTS

Two independent researchers (researcher and research assistant) screened the titles and abstracts of articles in the databases. Table 7.1 represents the number of hits per database for the caesarean section and hysterectomy search terms. There were no articles recommended on ResearchGate despite the request for articles receiving 361 views as of October 2014 or from the international physiotherspist contacted. In addition, international physiotherapists working in the women's health field are also presently following the request for articles that was posted by the researcher on ResearchGate.

Table 7.1: Number of hits per database for caesarean section and hysterectomy

Database	Caesarean section Number of hits	Hysterectomy Number of hits
CINAHL	79	33
Cochrane Library	971	7
MEDLINE	1409	773
PEDro	6	28
PubMed	1229	1117
Science Direct	4515	4892
Guidelines search engines	46	29
TOTAL HITS	8255	6879

At this stage of the study, the number of articles retrieved from the title and abstract search was 381 for the caesarean section and 279 for the hysterectomy section. Following the

removal of the duplicates per database, the final retrieval was 188 for the caesarean section and 148 for hysterectomy. Nineteen articles were added to the caesarean section and eight for hysterectomy after searching grey literature, and all the articles were subsequently critiqued using the PICOTT format that was outlined earlier (Chapter 3). The researcher checked all the information obtained twice to ensure that the correct articles were included, and the supervisor reviewed the entire process. Articles were excluded for the caesarean section search for the following reasons:

- the study not being conducted by physiotherapists (n=4);
- being pilot studies (n=3);
- the postpartum time was unclear (n=1);
- being antenatal intervention (n=4);
- being unable to differentiate postpartum caesarean section women in the studies (n=184);
- having no subdivision analysis in the results section with all postpartum patients being grouped together irrespective of mode of delivery, and the researcher being unable to determine the treatment effect specifically on patients who underwent a caesarean section (n=9);
- pregnancy complications resulting in the caesarean section was performed under general anesthesia (n=2).

The researcher emailed authors whose contact details were available (n=4) asking for the subdivision in the results, to which there was no response.

In the hysterectomy section, following the initial screening, articles were excluded for the following reasons:

- pilot study (n=2);
- mixed gender study with no differentiation (n=2);
- participants did not undergo a hysterectomy (n=9);
- no subdivision in results (n=141) type of surgery is not mentioned (n=1).

Due to the paucity of articles, the pilot studies that were initially excluded by the researcher were considered for review. The pilot studies in the caesarean section review (n=3) could not be included as there was no subdivision of the women with regard to mode of delivery in the results (n=1), and it was not stipulated whether women were postpartum (n=2). In the

hysterectomy review section, one article from the pilot studies (n=2) was selected for review while the other was excluded, as the author did not specify in the results section which women underwent the procedure. Figure 7.1 and figure 7.2 represent the screening process for the caesarean section and hysterectomy using an adapted version of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Moher, Liberati, Tetzlaff, Altman & The PRISMA Group, 2009).

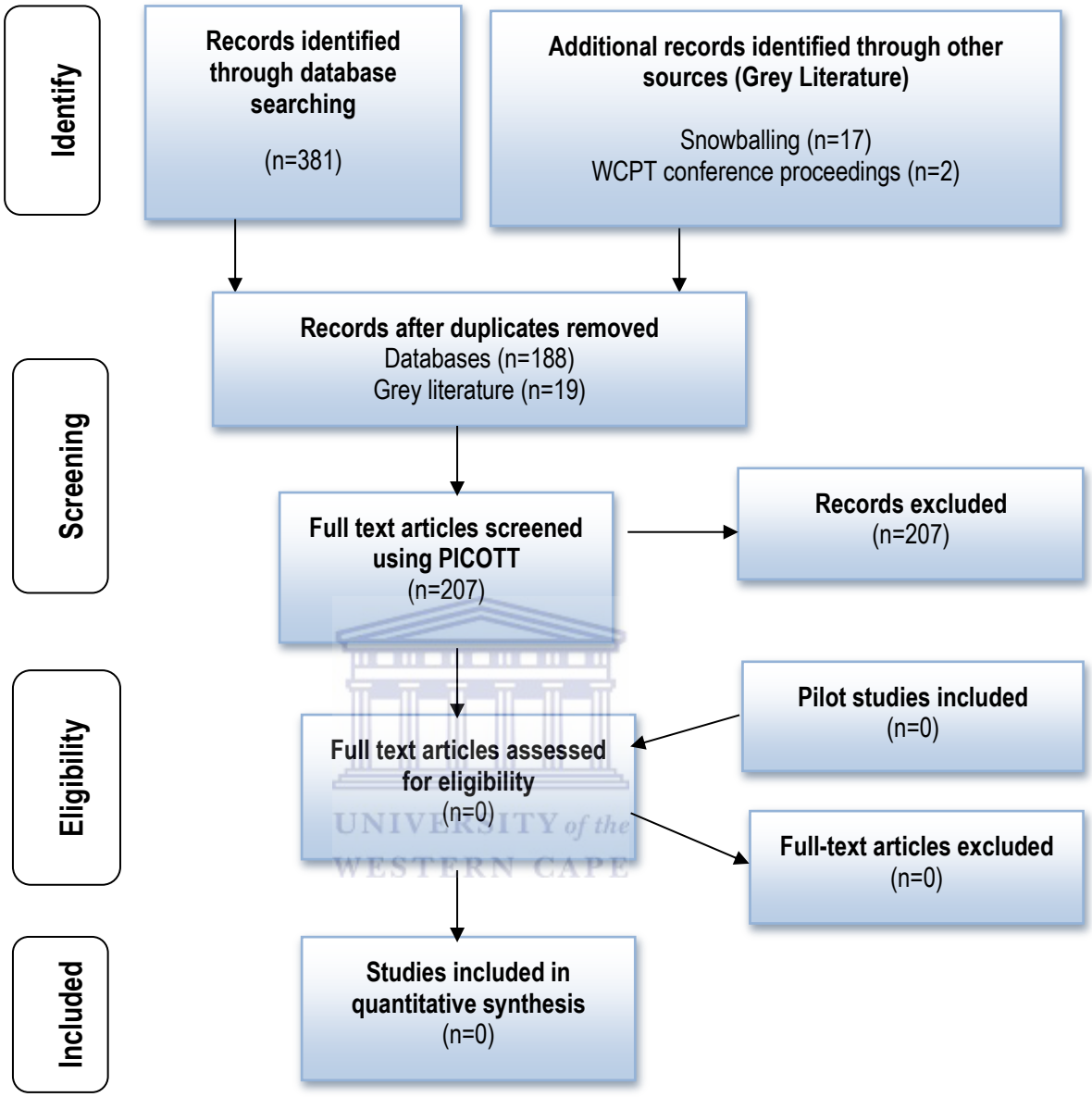


Figure 7.1: PRISMA flow diagram for article retrieval for caesarean section

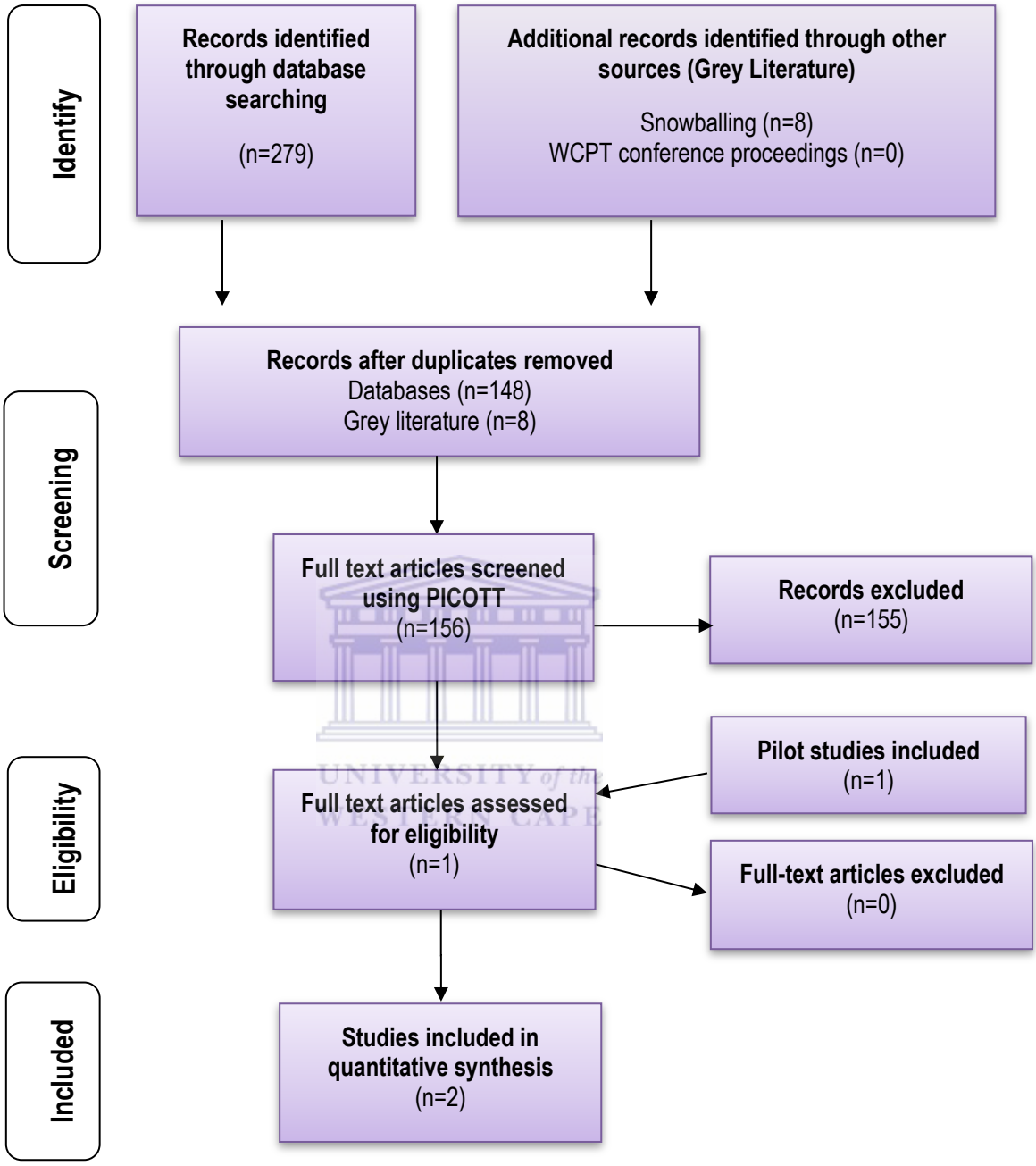


Figure 7.2: PRISMA flow diagram for article retrieval for hysterectomy

The selected studies that fulfilled the requirements (hysterectomy n=2) were then scored for methodological quality by two independent reviewers, using the PEDro scale for randomised controlled trials (Verhagen et al., 1998). The PEDro scale is a reliable tool and provides a score out of 10 (Maher, Sherrington, Herbert, Moseley & Elkins, 2003), while studies that attain a PEDro score of 4 or less are considered "poor quality", those that score five or six are considered "moderate quality" and studies scoring 7 or greater are considered "high quality" in terms of study methods and susceptibility to bias (Harvey, Herbert & Crosbie, 2002). Discrepancies between the scoring were discussed verbally until consensus was reached between the reviewers, with the scoring being adjusted accordingly (Table 7.2). The studies selected were of good methodological quality (Table 7.2) from which the data were then extracted and is presented in Table 7.3.

Table 7.2: Scoring of hysterectomy articles using the PEDro scale

Scoring criteria	Included articles*	
	Moriyama et al., (2008) Brazil	*Yang et al., (2012) Korea*
Score /10	7	7
Eligibility criteria specified**	Y	Y
Randomization	Y	Y
Allocation concealed	N	N
Baseline similarity	Y	Y
Blinding of subjects	Y	N
Blinding of therapists	N	N
Blinding of assessors	N	Y
>85% of subjects were measured for at least one key outcome	Y	Y
Outcomes measured for Treatment or control groups were received as allocated	Y	Y
Between group statistical comparison	Y	Y
Point measures and measures of variability for at least one outcome	Y	Y

** Scored as per the PEDro scale Yes = Y; No = N*
*** Not considered as part of the scoring*

A data extraction sheet was designed to identify relevant information in the study, such as author, date of publication, country, population (sample size, age and gender), the type of interventions and outcome measures used, the results, and the conclusions from the studies; this is represented in Table 7.3 and discussed in the subsequent section.

Table 7.3: Data extraction sheet for selected articles for hysterectomy

Reference	Key Features	Intervention	Outcome Measurement Tools	Statistics	Authors Conclusions	Comments
Moriyama et al., (2008) Brazil	RCT 44 participants Age: 52 ± 4.0 years Post hysterectomy Patients were blinded Data collected at baseline and 6 months	Randomized to one of: 1. *Physical exercise and hormone therapy (PEHT)* 2. *Sedentary and hormone therapy (SEDHT)* 3. *Physical exercise and placebo (PEPLA)* 4. *Sedentary and placebo (SEDPLA)* The participants receiving hormone therapy were given: estradiolvalerate 1 mg/day, orally for 6 months. The participants in the Physical exercise group : 60 minutes of moderate-intensity exercise of stationary bicycling 3 days per week for 6 months The participants in the sedentary group: Were asked to maintain their normal habits and refrain from physical exercise	1. Kupperman Index 2. Brazilian version of the SF-36 health related quality of life questionnaire (HRQoL) 3. VO2peak	Kupperman Index: PEHT, PEPLA, SEDPLA ($p>0.05$) SEDHT ($p>0.01$) HRQoL: Analyses of variance showed a significant difference in certain categories among participants who exercised regardless of hormone therapy. Physical functioning ($p=0.001$) and bodily pain ($p=0.012$)	Moderate aerobic exercise significantly affected symptoms and HRQOL. Physical exercise can therefore be considered an alternative to hormone therapy.	Study was rated as high methodological quality. < 80% power as the final calculation was < 12 per group. Time frame post hysterectomy was not clear (years or months). Exercise program lends itself to reproducibility within a South African clinic setting. Sedentary group activities while cannot be controlled should have been recorded. The study leaves room for further research with a larger sample size.
Yang et al., (2012) Korea	RCT – Pilot study 24 participants Age: 52.2 ±7.8 years Post-radical hysterectomy and pelvic lymphadenectomy Evaluators were	Randomized to either: 1. Pelvic floor muscle training incorporated with core exercise (PFRP) 2. Control group (non-PFRP) The PFRP program consisted of: one 45-min exercise session (biofeedback and core exercise	1. Australian Pelvic Floor Questionnaire 2. Pelvic floor muscle strength using a perineometer and 2-channel EMG 3. Motor evoked	Australian Pelvic Floor Questionnaire Bladder function score: $p=0.452$ Bowel function score: $p=0.497$ Sexual function score: $p=0.048$ (higher in PFRP group)	The results suggest that the PFRP improved pelvic floor dysfunction and QoL of gynaecological cancer patients; however a larger sample size is needed.	Study was rated as high. The participants in the intervention group received a very structured home program that could have also resulted in the improvement and it was unclear whether the control group received the same

	blinded to grouping Data collected at baseline and 4 weeks	sessions) and a 30-min counseling session per week for 4 weeks. The participants were also lectured on the anatomy and function of the pelvic floor on week one and were given a home exercise to do in conjunction with the exercises. The non PFRP group received an informative leaflet with home-based pelvic floor exercise, lifestyle advice and a telephone number for further explanations.	potentials from the pelvic floor obtained by sacral and transcranial magnetic stimulation using a Magstim 200 stimulator 4. HRQoL using EORTC QLQ-C30 and QLQ-CX24	Pelvic floor muscle strength: p=0.036 (higher in PFRP group) Motor evoked potentials*: Threshold to cortical stimulation: p=0.014 (lower in the PFRP group) HRQoL: A Clinically meaningful differences (≥10 points) Was observed in the PFRP group in terms of physical function, pain, sexual worry, sexual activity, and sexual/vaginal function.		home program. It was not stated whether these sessions were done as group sessions or individual, which could also affect the patients' recovery. As per the limitations mentioned, the number of years post hysterectomy along with the surgical technique was not taken into account also it was whether the patients had urinary incontinence and the type prior to the treatment was not measured. The program used in this study lends itself to reproducibility within a South African clinic setting provided the placement has the equipment. The study leaves room for further research with a larger sample size.

**Only the 13 participants where the authors elicited a motor evoked response at baseline were tested after the 4 weeks.*

7.3 DISCUSSION

The COCHRANE handbook describes a systematic review as an attempt to identify, appraise and synthesise all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question (Higgins & Green, 2011). This form of research, often termed "secondary research" (Clarke, 2011), is important in guiding practitioners to make effective clinical decisions in practice (de Vet et al., 1997). The researcher initially thought of changing the study design to a scoping study, as scoping studies are defined as "to map rapidly the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as stand-alone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before" (Arksey & O'malley, 2005). However, as scoping studies use broad topics, any study design is applicable and does not assess the methodological quality of an article (Armstrong, Hall, Doyle & Waters, 2011). The researcher shied away from conducting the scoping study as this review had specific questions that were the appropriate study design and could be identified. For guideline development, the methodological quality of the articles selected needed to be established.

The purpose of the present systematic review was to examine research studies about the efficacy of physiotherapy interventions in treating women post caesarean section and post hysterectomy. Following the review process, the articles that fitted the inclusion criteria of the study were RCTs pertaining to hysterectomy. The lack of results from the systematic review for both the caesarean section and the hysterectomy led the researcher to consider including physiotherapy management of lower abdominal surgery. The reason for surgical intervention was different, which had a major effect on the recovery and the type of postoperative complications the patient experienced. The researcher therefore could not include lower abdominal surgery in the search. Following the review process, the only intervention in the reviewed studies that should be included as part of the physiotherapy management strategy for women post hysterectomy was exercise.

7.3.1 Physiotherapy management post hysterectomy

The abrupt onset of menopausal symptoms is often experienced by women who undergo a oophorectomy (Kotz, Alexander & Dennerstein, 2006). Research has shown that undergoing a hysterectomy can also result in ovarian failure that leads to the early onset of menopause at least four years earlier than women who did not undergo a hysterectomy (Farquhar, Sadler, Harvey & Stewart, 2005). Apart from the common menopausal symptoms such as anxiety, hot flushes, mood swings, fatigue, night sweats and insomnia (Simon, Moore, Murphy, Hess & Ravnikar, 2007), the sudden drop in estrogen levels leads the body to be vulnerable to osteoporosis (Carlsten, 2005; Melton et al., 2003), depression (Heliövaara-peippo et al., 2009), cardiac disease (Atsma, Bartelink, Grobbee & van der Schouw, 2006), rheumatoid arthritis (Carlsten, 2005) and a reduced life expectancy (Rocca, Grossardt, de Andra, Malkasian & Melton, 2006). Hormonal therapy remains the treatment of choice for menopausal symptoms and is often prescribed to women post hysterectomy (Moriyama et al., 2008), but it is often associated with adverse effects (Greendale et al., 1998). The QoL is worse among women who underwent a "surgical" menopause compared to a natural one (Bhattacharya & Jha, 2010) but exercise has been shown to offer numerous benefits to postmenopausal women, which improves it (Moriyama et al., 2008).

The study by Moriyama et al. (2008) showed an improvement of menopausal symptoms across all the study groups, with a statistically significant improvement being noted in the HRQoL among participants in the moderate aerobic exercise programme with placebo when compared to the other groups. However, the study did not specify when the participants underwent the operation (Moriyama et al., 2008), and anecdotal information received from gynaecologists (N=3) indicates that return to normal function is dependent on the mode and type of surgery, with six-weeks of no heavy lifting and/or intense physical activity recommended for women undergoing an abdominal hysterectomy. While the study sample size was small (Moriyama et al., 2008), the positive results indicated that moderate intensity aerobic exercise should be considered as part of the medium and long-term management for patients post hysterectomy. Another area that has recently been getting attention but still remains slightly controversial is the link between urinary incontinence and hysterectomy.

The link between urinary incontinence and hysterectomy is a controversial area, with studies stating the operation either does or does not predispose one to urinary incontinence (Magos,

2007). The results from this study (Chapter 5) and recent prospective studies of better methodological quality are now confirming that a hysterectomy does predispose women to urinary incontinence (Yang, Lim, Rah & Kim, 2012; Altman et al., 2007), which was also highlighted in a systematic review over a decade ago (Brown et al., 2000). What remains unclear is the type of urinary incontinence that occurs. Urinary incontinence can be classified as stress, urgency, or mixed urinary incontinence. Stress urinary incontinence as defined by Haylen et al. (2010) is a "complaint of involuntary loss of urine on effort or physical exertion (e.g. sporting activities), or on sneezing or coughing". Physiologically it occurs as a result of a sudden increase in intra-abdominal force, resulting in the bladder pressure exceeding the urethral pressure (Norton & Brubaker, 2006), and is also the most common subset of urinary incontinence affecting women (Elmissiry, Mahdy & Ghoniem, 2011). Urgency urinary incontinence is defined as a "complaint of involuntary loss of urine associated with urgency" (Haylen et al., 2010) that is often caused by detrusor muscle over activity or bladder over-sensitivity (Haylen et al., 2010; Norton & Brubaker, 2006). Lastly, mixed urinary incontinence, which is a combination of stress and urgency urinary incontinence, is a "complaint of involuntary loss of urine associated with urgency and also with effort or physical exertion or on sneezing or coughing" (Haylen et al., 2010). While physiotherapists are involved in managing all these subsets of urinary incontinence, the management approaches do vary (Greer, Smith & Arya, 2012; Price, Dawood & Jackson, 2010; Berghmans et al., 2000) and to improve treatment efficacy and effectiveness, it is important to understand which type of incontinence the patient has prior to commencing treatment.

Yang et al., (2012) found that pelvic floor muscle training incorporated with core exercises improved the HRQoL and certain components of pelvic floor dysfunction, such as sexual function and pelvic floor muscle strength. However, there was no significant change in the bladder function score both within the group and between the groups even though the pelvic floor muscle strength improved. A previous review of studies in this area resulted in variable reviews about the inclusion of core exercises in women with stress urinary incontinence (Bø, 2004). A more recent study showed that submaximal contraction of the pelvic floor muscles and transverse abdominis assisted in elevating the bladder neck (Junginger, Baessler, Sapsford & Hodges, 2010). While the study isolated the two muscle groups, it was suggested that coordination between the two is required for rehabilitation. The study was however only performed on continent women and had a small sample size (Junginger et al., 2010).

The principles of this study were applied in the pilot study selected for review, but the researchers (Yang et al., 2012) do not state the extent to which the muscle was recruited, which could be the reason for lack of change in the bladder function score. Furthermore, the authors did not state whether urinary urgency was found to be a problem among this cohort of women (Yang et al., 2012). A systematic review revealed that although evidence suggests that pelvic floor exercises may be beneficial for women with urgency urinary incontinence, the studies in this area are of only fair methodological quality, and have insufficient data to determine if treatment improves urinary frequency or nocturia (Greer et al., 2012). The results therefore may have been different or more significant if the management strategy incorporated aspects of bladder retraining, which has been shown to have some benefit to women diagnosed with urge urinary incontinence (Berghmans et al., 2000). The research results of Yang et al., 2012 should therefore be used with caution, as more research is needed in this area, especially using incontinent women to determine its effectiveness (Bø, 2004) prior to its use in everyday practice. Physiotherapists treating women with pelvic floor dysfunction should therefore perform a detailed assessment and internal vaginal examination to determine the type of incontinence before prescribing a treatment.

7.3.2 The way forward with a dearth of literature

The paucity of research in this area could be a possible reason for there being no Physiotherapy Clinical Guidelines for women undergoing caesarean section or hysterectomy, and for the physiotherapists not using evidence-based practice (Dannapfel et al, 2013). The research that is available in the postnatal area did not differentiate between the methods of birthing, which is important, because women who deliver vaginally are at a higher risk for developing pelvic floor disorders, this being independent of parity (Lukacz, Lawrence, Luber, Contreras & Nager 2006). Present guidelines available in areas such as postnatal incontinence also did not differentiate between the birthing process and among women who had undergone a caesarean section (elective or emergency) (Hay-Smith et al., 2008). Information regarding the cause for the incontinence will provide therapists with a better understanding of patient management as well as the expected recovery time.

While patients undergoing an emergency caesarean section are at a higher risk of developing incontinence (Chin et al., 2006), the recovery time and the muscles that need to be retrained may differ from women who undergo a vaginal or elective caesarean section. As it is a

situation where clinical reasoning comes in, we should still try to establish a baseline or norm with better-researched areas in physiotherapy. In terms of managing patients after a hysterectomy, there are no universally accepted guidelines, despite the potential for short- and long-term complications (Simon et al., 2007). In a South African context and considering the results from this study, the impact of HIV on postnatal and post hysterectomy complications needs to be considered as well as the type of treatment for HIV-infected patients.

Research in the health science field is not easy, and although there has been growth in the number of RCTs over the years, it still remains inadequate (Johnston, 2003), with the lack of literature in this field being testament to this. Recruitment (Puffer & Torgerson, 2003) and retention (Cooley et al., 2003) of participants in clinical trials is usually the biggest barrier, which was also noticeable in the article selected for the review with each group having fewer than 15 participants (Moriyama et al., 2008).

In South Africa, research is often performed in public or state hospitals, with the patients often living in rural areas or informal settlements, therefore the inconvenience, cost (Harris et al., 2011) and time of travel to the hospital are often seen as barriers to research. International articles have recommended ways to overcome the problem of recruitment and retention in clinical trials, such as: limiting the selection criteria to only those that are scientifically meaningful and necessary; obtaining the correct contact information from a participant including that of a close relative; maintaining contact with the participant prior to the scheduled visit, consider the patient's tolerance for testing and treatment; acquiring support from physicians; acquiring and maintaining support from physiotherapists; budgeting for incentives to compensate for the burden of travel, and developing a good relationship between staff and study participants (Bell et al., 2008; Blanton et al., 2006; Fitzgerald & Delitto, 2001). However, the applicability of these methods to developing countries such as South Africa still needs to be established. The current status quo puts researchers into a difficult situation, as the research received will improve the lives of women in developing countries such as South Africa and possibly reduce the current health burden in South Africa, but large amounts of funding in this particular area are required especially in physiotherapy. An option would be to establish a physiotherapy research centre with clinicians employed for the sole purpose of research and advancing our profession.

7.4 CONCLUSION

The purpose of this systematic review was to identify the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy. The systematic review yielded two articles that could be considered for review, both of which were in the hysterectomy section. Only one of the two articles reviewed can be considered for use in clinical practice. This article showed that moderate aerobic exercise could be used to improve menopausal symptoms as well as HRQoL. Clinical guidelines are usually formulated from evidence-based research with strong evidence of effectiveness (van der Wees & Mead, 2004), but in the absence of RCTs, expert opinion and formal consensus are still considered on the level of evidence (NICE, 2005). Although clinical guideline generation by expert opinion is the lowest form of evidence, it is still considered a type of clinical guideline (Owens, 1998; Eddy 1990). The major limitation to this form of clinical guideline is that it may only reflect the opinion of the experts, but it will be combined with the article found in this systematic review (Owens, 1998; Eddy, 1990) and can be used as a starting point for the profession in this area. The following chapter is therefore a Delphi study to determine the physiotherapy management of HIV-infected and HIV non-infected women post caesarean section or post hysterectomy comprising of experts in the field of women's health in physiotherapy.

CHAPTER 8. PHYSIOTHERAPY MANAGEMENT STRATEGIES OF WOMEN POST CAESAREAN SECTION AND HYSTERECTOMY

8.1 INTRODUCTION

In the previous chapter it was reported that no studies were found that met the criteria outlined for women post caesarean section, and only one was identified in the hysterectomy section following the systematic review. The information from phases 1, 2 and 3 were initially to be collated to form a draft set of guidelines in this area with the recommendations grounded by evidence-based research. The draft guidelines would have been presented to an expert panel consisting of physiotherapists, obstetricians and gynecologists for comment. However, owing to the paucity of research identified by the systematic review in the area, this was not possible. The researcher therefore had to adjust the objectives of Phase 3 in order generate the information required to develop clinical guidelines in this area to benefit to both patients and physiotherapists. Thus during this phase of the study, the results pertaining to the complications experienced by women post-CSD (Chapter 4) and post hysterectomy (Chapter 5) were presented to an expert panel of physiotherapists in women's health. The Delphi method was used to determine the appropriate physiotherapy management techniques for the complications identified by the women, and to reach consensus. The results will assist in formulating clinical guidelines, which, due to the dearth of evidence in the literature, will be based on expert opinion. The results, discussion and conclusion are presented in this chapter.

8.2 RESULTS

The results will be presented in the following sections: socio-demographics and education of the panel participants, Delphi results Round 1, summary of Delphi results Round 1, and Delphi results Round 2.

8.2.1 Socio-demographics and education of the panel participants

Thirteen physiotherapists agreed to participate in the study, of whom only 12 (N=12) completed the questionnaires for Round 1 and Round 2, yielding a response rate of 92%. All

the participants in the panel were female (100%; N=12) with 50% being between the ages of 30 and 40 years old. Racially, 75% of the participants were White (n=9), 17% were Coloured (n=2), and 8% were Indian (n=1). The majority of the participants resided in the Western Cape Province (42%; n=5) and were privately employed (67%; n=8).

With regard to experience, the participants obtained their undergraduate qualifications from 1973 to 2008. The majority attended one or more women's health courses (83%; n=10) and two participants held a postgraduate qualification in women's health (17%). The average time of experience in the field of women's health was 10 years, the highest being 26 years and the lowest being one year. The socio-demographic and education details of the participants are represented in Table 8.1

Table 8.1: Socio-demographic and education profile

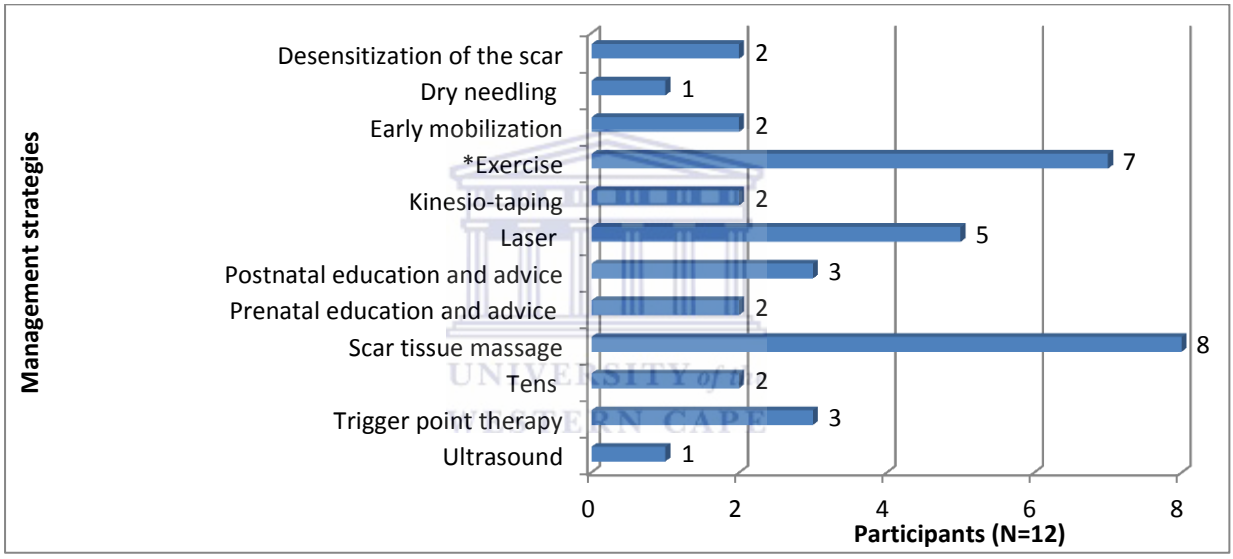
Socio-demographic Information	Categories	Total N =12 (%)
Age	<30 years old	1 (8%)
	30 years – 40 years old	6 (50%)
	41years – 50 years old	2(17%)
	>50 years old	3 (25%)
Race	African	0 (0%)
	Coloured (mixed ancestry)	2 (17%)
	Indian	1 (8%)
	White	9 (75%)
Residing province/ country	Gauteng	2 (17%)
	KwaZulu-Natal	3 (25%)
	United Kingdom	2 (17%)
	Western Cape	5 (41%)
Employment	Private Sector	8 (67%)
	Public Sector	1 (8%)
	Academic	2 (17%)
	Private Sector - not with patients	1 (8%)
Postgraduate qualification in Women's Health	Yes	2 (83%)
	No	10 (17%)
Postgraduate courses in Women's Health	Yes	10 (83%)
	No	2 (17%)
Years of experience in women's health	1 – 5 years	6 (50%)
	6 – 10 years	1 (8.3%)
	11 – 15 years	1 (8.3%)
	16 – 20 years	1 (8.3%)
	>20 years	3 (25%)

8.2.2 Delphi Results: Round 1

This section will be divided into two sub-sections, namely: a) management strategies for patients post caesarean section delivery, and b) management strategies for patients post hysterectomy.

a) Management strategies for patients post caesarean section delivery

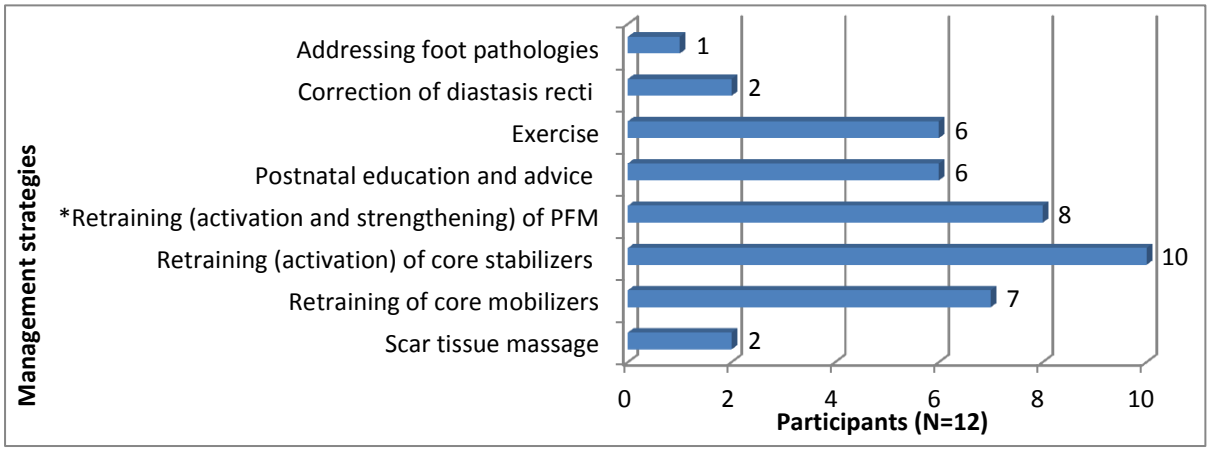
The collated results show that to manage pain at the operation site, the most common treatment technique was "scar tissue massage" (67%; n=8), followed by "exercise: abdominal muscle strengthening and general body conditioning" (58%; n=7). A list of the collated treatment techniques as mentioned by the participants is given in Figure 8.1.



**Exercise: abdominal muscle strengthening and general body conditioning*

Figure 8.1: Management of pain at the operation site in patients post-CSD

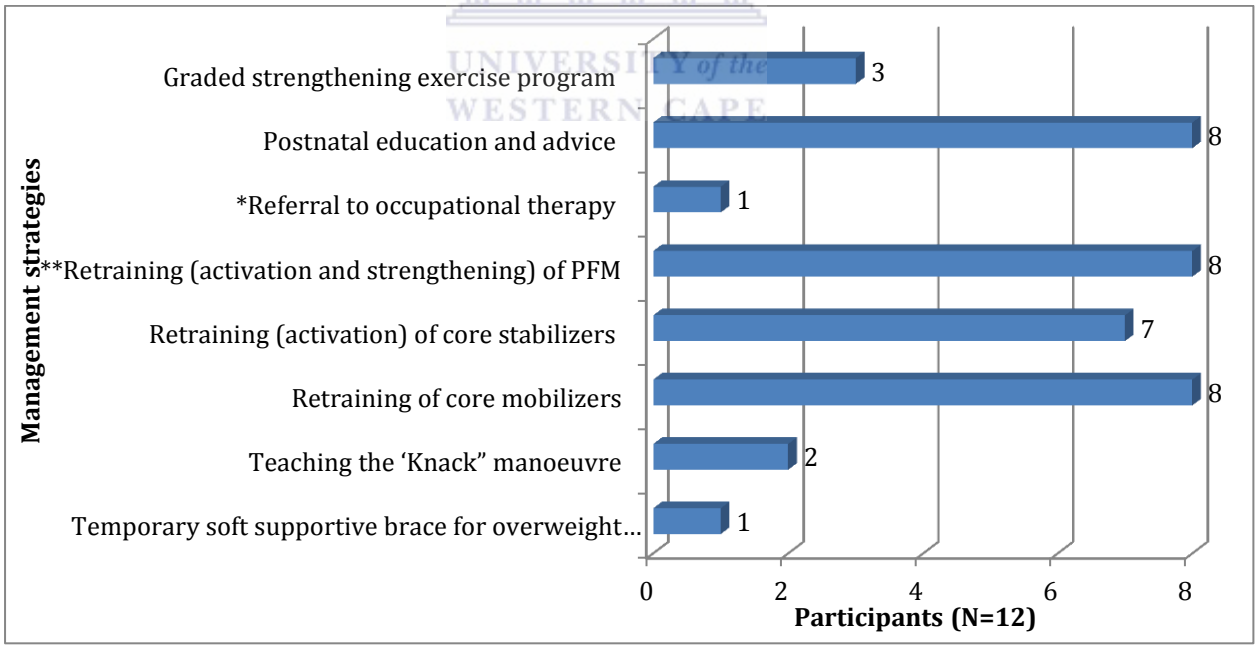
The inability to perform vigorous activities post caesarean section was identified as a problem, and 10 (83%) stated they would retrain (activation) the core stabilisers (TrA, multifidus and pelvic floor muscles) to manage these patients, which was followed by "retraining (activation and strengthening) of pelvic floor muscles" (67%; n=8) (Figure 8.2).



**PFM=pelvic floor muscles*

Figure 8.2 Management of patients who struggle to perform vigorous activities post-CSD

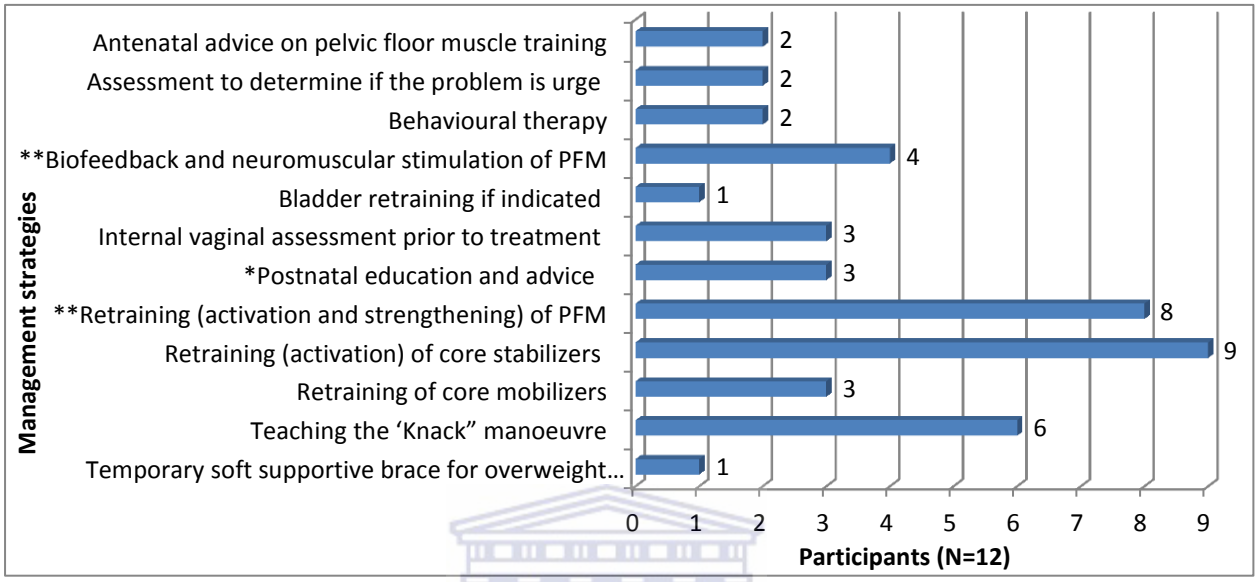
The results indicated that 67% (n=8) stated that they would use "postnatal education and advice (ergonomics, kinetic handling, supported coughing, bracing during strenuous activities)", retraining of core mobilisers and "retraining (activation and strengthening) of pelvic floor muscles" to manage participants who struggled to perform bending, kneeling and stooping (Figure 8.3).



**Referral to occupational therapy for assessment and suitable devices*
***PFM=pelvic floor muscles*

Figure 8.3: Management of patients who struggle to perform bending, kneeling and stooping post-CSD

For patients who experience urinary incontinence, most of the participants (75%; n=9) mentioned retraining (activation) of core stabilisers followed by "retraining (activation and strengthening) of the pelvic floor muscles" (67%; n=8) as a management strategy (Figure 8.4).



**Postnatal education and advice on bladder and bowel activity*
***PFM=pelvic floor muscles*

Figure 8.4: Management of patients with urinary incontinence post-CSD

Figure 8.5 indicates that "soft tissue mobilisation and myofascial release" was mentioned by the majority of the participants (83%; n=10) as a management strategy for patients with lower back pain post-CSD, closely followed by spinal mobilisation (75%, n=9).

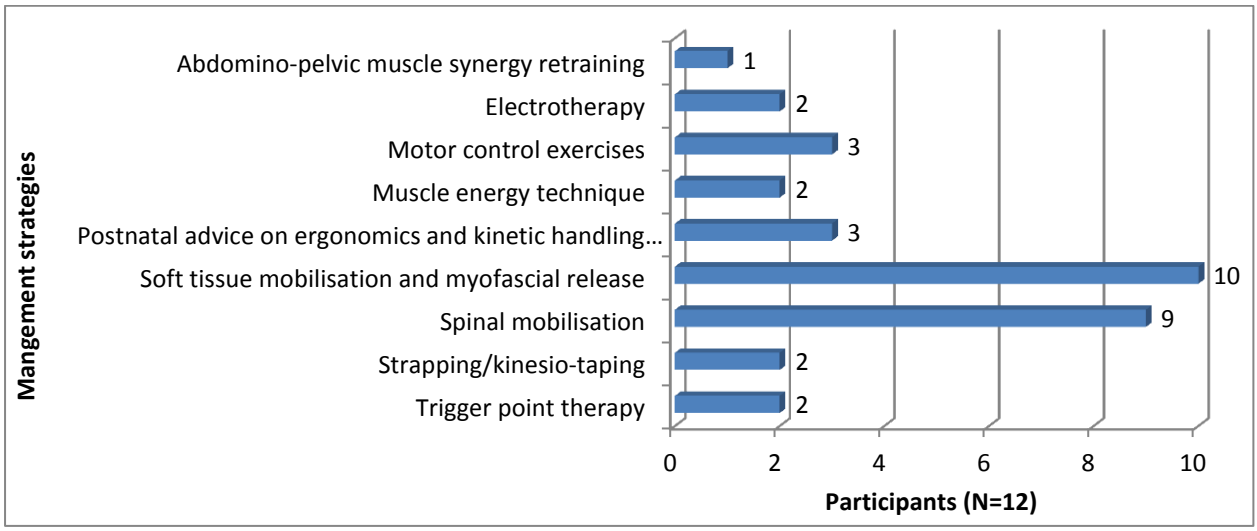


Figure 8.5: Management of patients with lower back pain post-CSD

The most common 'other' physiotherapeutic intervention strategies for women post-CSD mentioned were "advice on breast-feeding", "advice on sexual problems" and "education and advice on post-natal depression" (25%; n=3) (Figure 8.6).

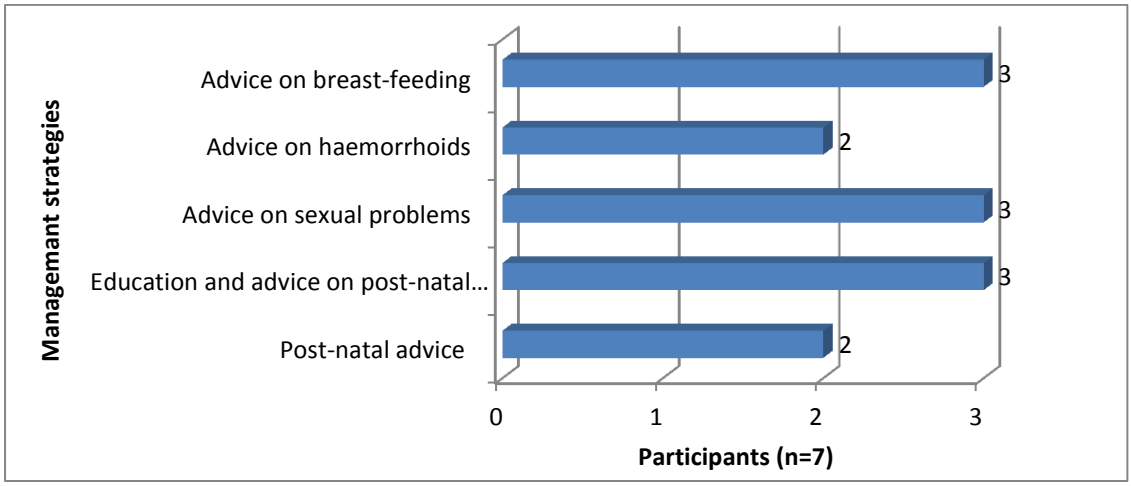


Figure 8.6: Additional intervention strategies for women post-CSD

b) Management strategies for patients post hysterectomy

The results show that 67% (n=8) of participants mentioned that they would use "exercise" comprising "abdominal muscle strengthening and general body conditioning" as a management strategy for patients with postoperative incision pain. "Scar tissue massage" was the next management strategy most frequently mentioned (50%, n=6) (Figure 8.7).

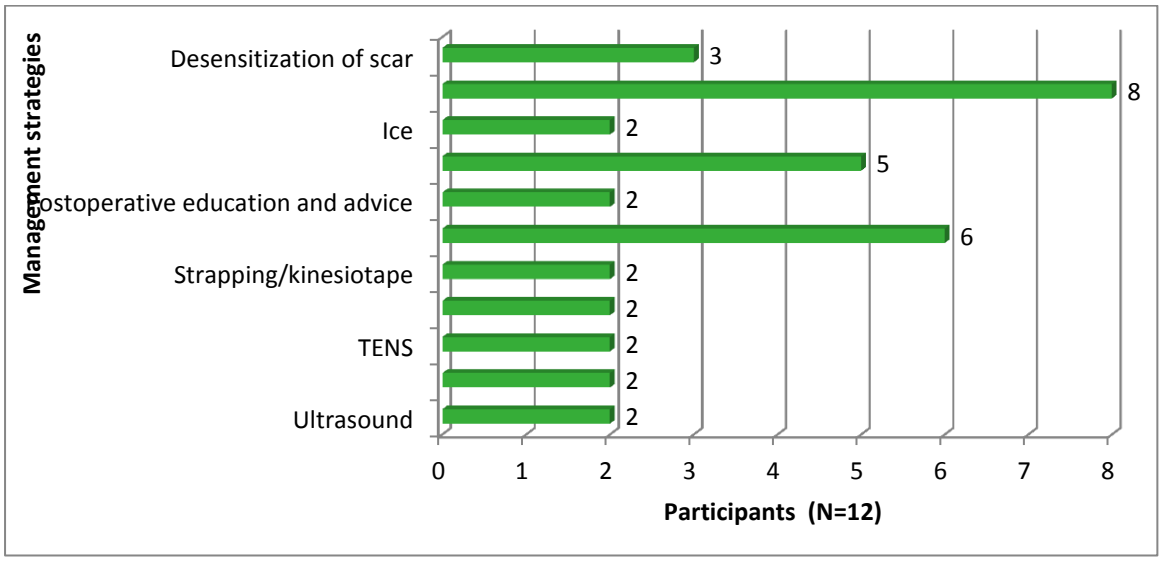
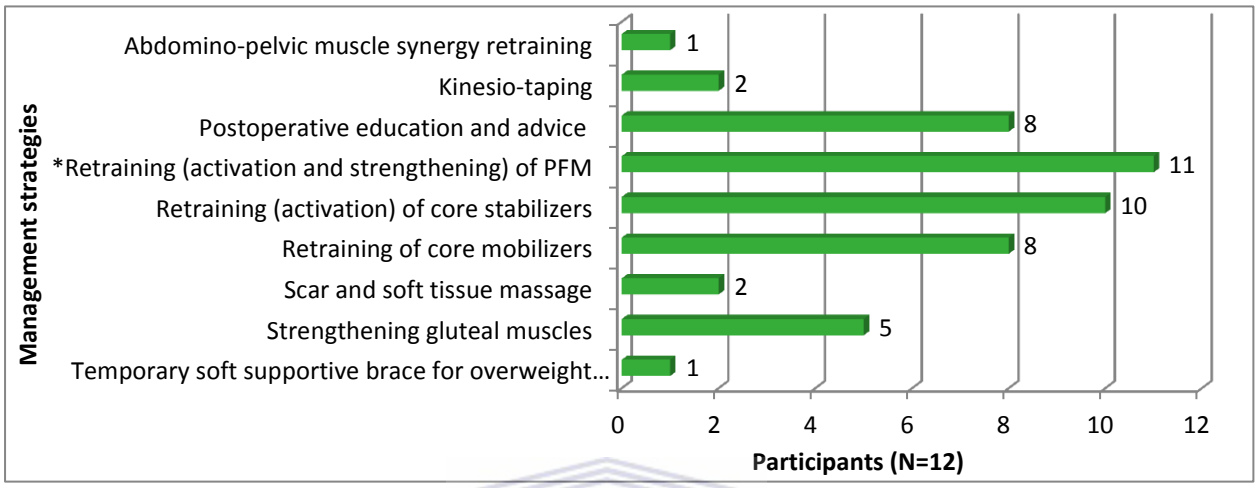


Figure 8.7: Management of pain at the operation site in patients post hysterectomy

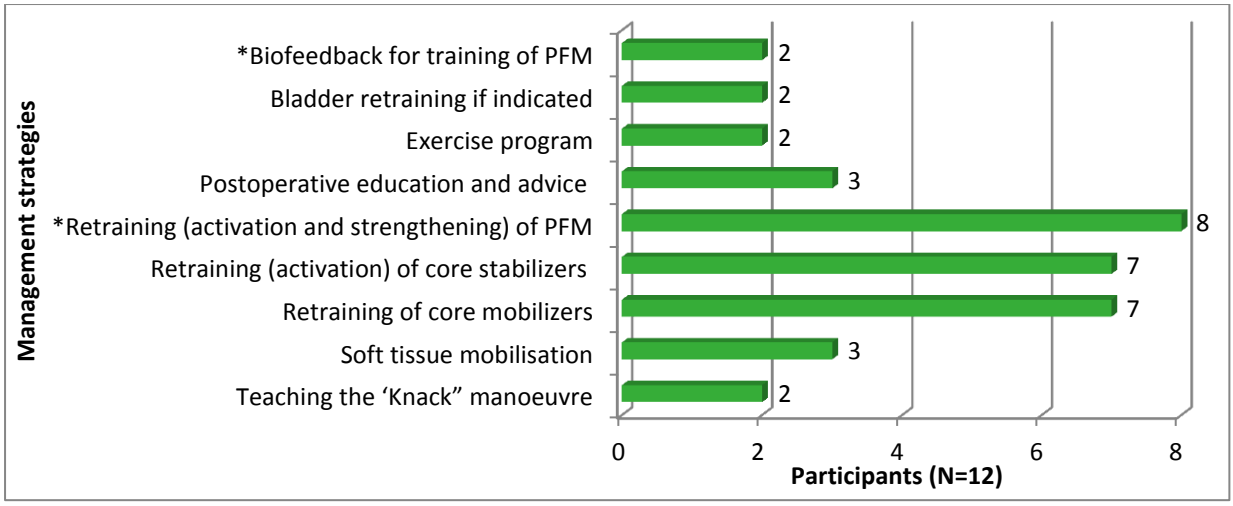
To manage patients who struggled to perform vigorous activities, the majority of participants mentioned retraining (activation and strengthening) of pelvic floor muscles (92%; n=11), followed by retraining (activation) of core stabilisers (83%; n=10) as treatment strategies (Figure 8.8).



**PFM=pelvic floor muscles*

Figure 8.8: Management of patients who struggle to perform vigorous activities post hysterectomy

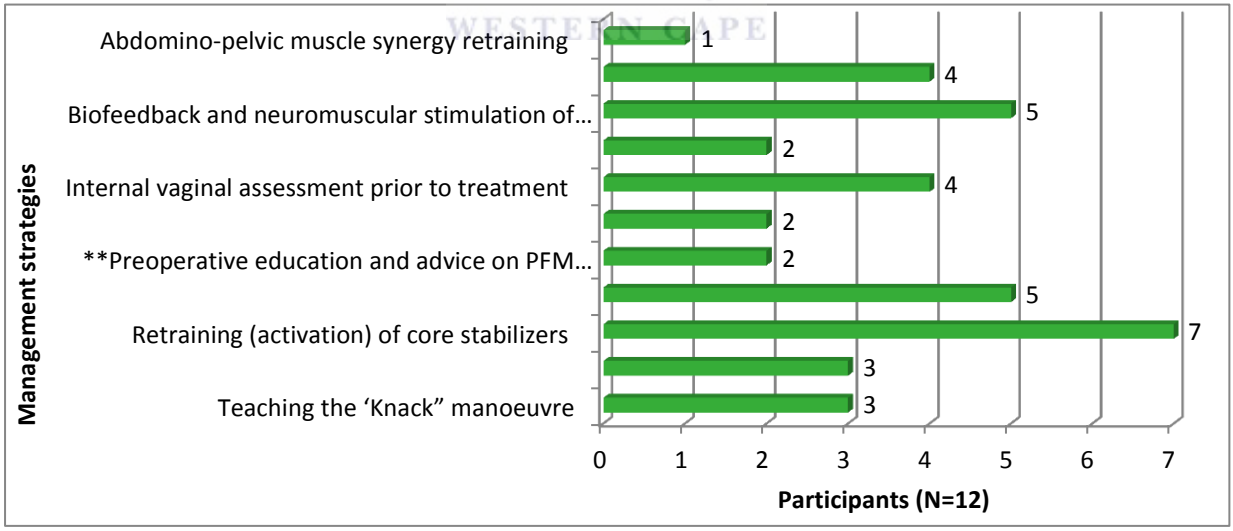
As illustrated in Figure 8.9, the results suggest that the participants mentioned retraining (activation and strengthening) the pelvic floor muscles (87%; n=8), followed by retraining of core mobilisers (58%; n=7) and activating core stabilisers e.g. transverse abdominis, multifidus and the pelvic floor (58%; n=7), as treatment techniques for patients who struggle with bending, kneeling and stooping.



**PFM=pelvic floor muscles*

Figure 8.9: Management of patients who struggle to perform bending, kneeling and stooping post hysterectomy

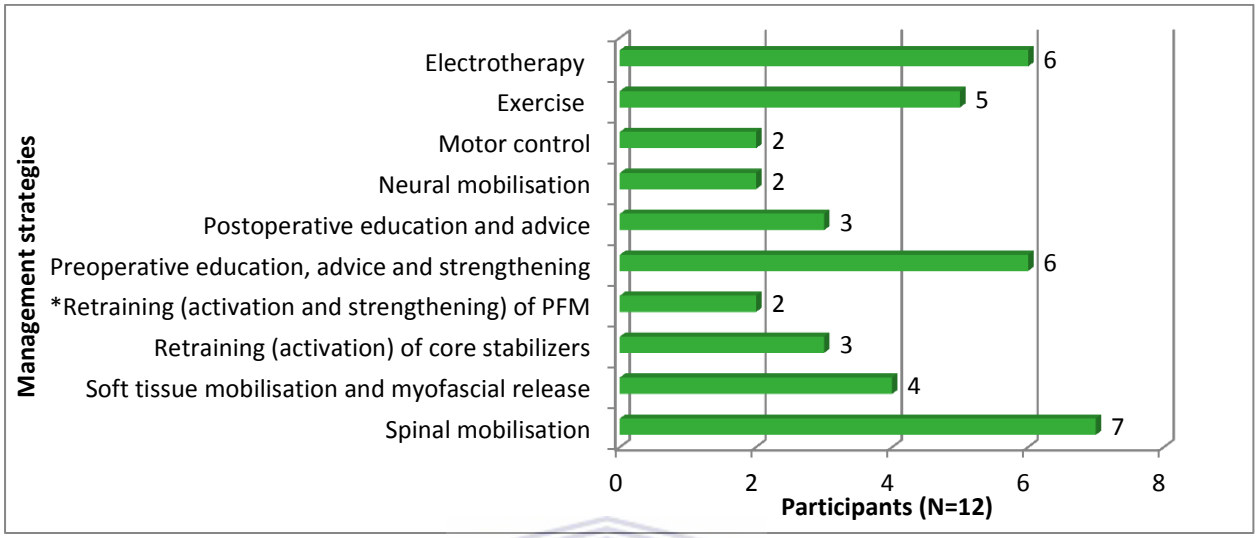
The most frequently mentioned treatment strategy for patients struggling with urinary incontinence post hysterectomy was retraining (activation) of core stabilisers e.g. transverseabdominis, multifidus (58%; n=7) followed by retraining (activation and strengthening) of the pelvic floor muscles (42%; n=5) (Figure 8.10).



** Assessment to determine if the problem is urge or stress incontinence including a bladder diary*
***PFM=pelvic floor muscles*

Figure 8.10: Management of patients with bladder incontinence post hysterectomy

Figure 8.11 shows that 58% (n=7) of participants mentioned "spinal mobilisation" as a treatment technique for participants with lower back pain post hysterectomy, which was followed by electrotherapy modalities 50% (n=6).



**PFM=pelvic floor muscles*

Figure 8.11 Management of patients with lower back pain post hysterectomy

The majority of participants mentioned "lymphatic drainage" (67%; n=8) as a treatment technique for patients who experience lower-limb swelling post hysterectomy (Figure 8.12).

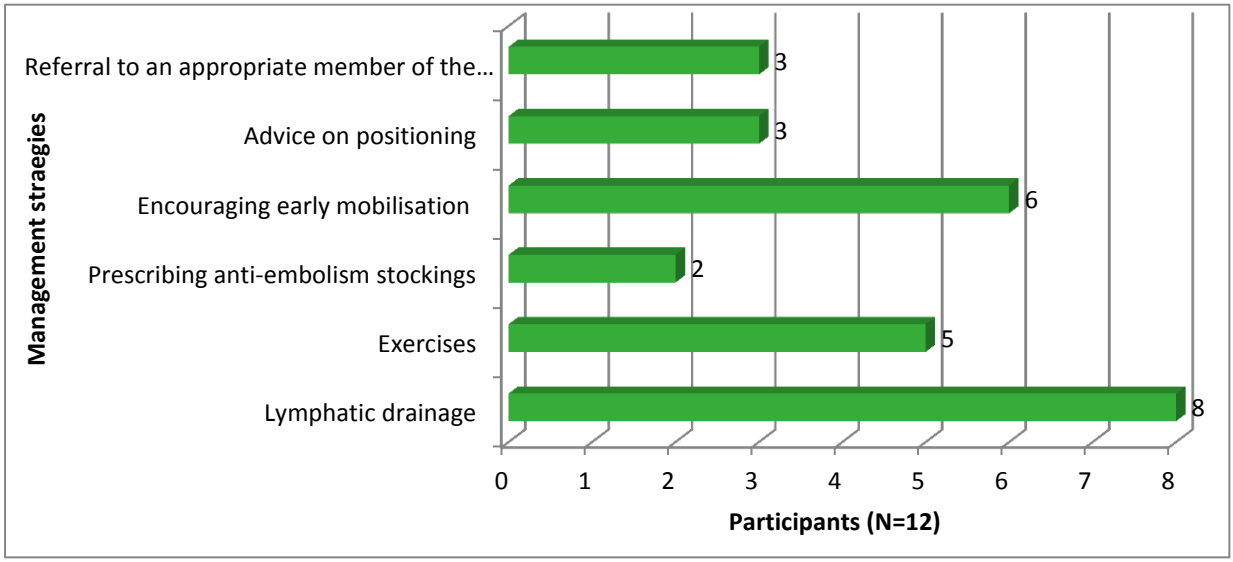


Figure 8.12: Management of patients with lower-limb swelling post hysterectomy

In terms of other intervention strategies to consider for patients post hysterectomy, the results show that preoperative counselling for patients was mentioned most frequently by participants (33%; n=4) (Figure 8.13).

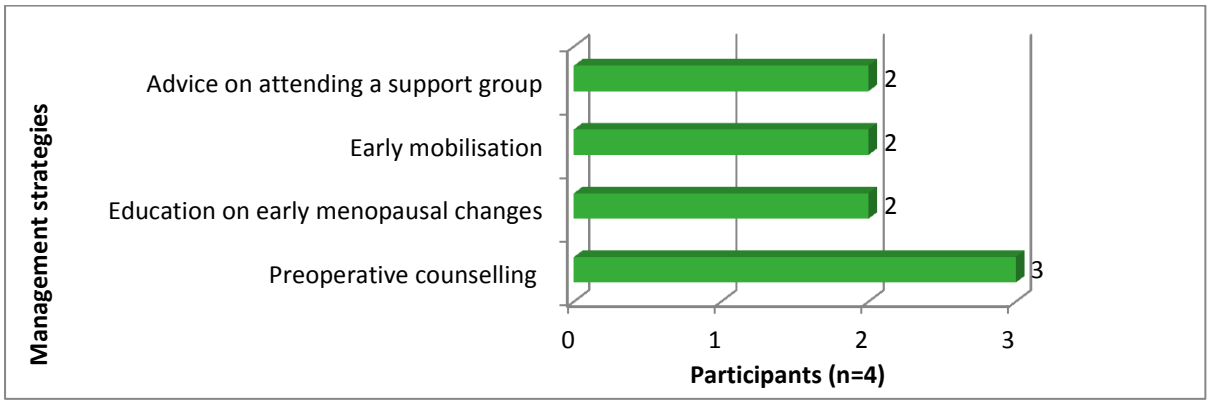


Figure 8.13 Additional intervention strategies for women post hysterectomy

8.2.3 Summary of Delphi results: Round 1

The results from this phase of the Delphi showed that the experts suggested various techniques and management strategies to prevent or manage complications in women post-CSD and post hysterectomy. From the results, certain treatment techniques emerged as being preferred for specific complications. In Round 2, all the results from Round 1 were presented to the participants, to give them the opportunity to view the suggestions of the other experts, change their original suggestion, and rate the techniques according to a Likert scale, which will be used to determine the level of agreement per technique (Hsu & Standford, 2007). The researcher then ranked the selection based on the results and feasibility in terms of management strategy, which was based on literature specific to the complication but not to the population.

8.2.4 Delphi Results: Round 2

This section is divided into two sub-sections namely: a) management strategies for patients post caesarean section delivery and b) management strategies for patients post hysterectomy.

a) Management strategies for patients post caesarean section delivery

In the second round, all the opinions and management/treatment strategies were presented to the panel, irrespective of how many participants initially suggested them. The results for managing patients who presented with pain at the operation site show that participants agreed on most of the treatment techniques. However, exercises such as abdominal muscle strengthening and general body conditioning as well as postnatal education and advice received the highest rating in terms of consensus (5) and level of agreement (83.3%) (Table 8.2). This indicates that participants are most likely to use the aforementioned treatment techniques as their initial option for patient presenting with postoperative pain post-CSD.

Table 8.2: Consensus on treatment strategies for patients with pain at the operation site post-CSD

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Desensitization of the scar	8.3%	16.7%	25.0%	16.7%	33.3%	50.0%	3.50	3.50	5	1.382
Dry needling	41.7%	16.7%	41.7%	0.0%	0.0%	0.0%	2.00	2.00	1[a]	.953
Early mobilization	8.3%	0.0%	16.7%	8.3%	66.7%	75.0%	4.25	5.00	5	1.288
Exercise: abdominal muscle strengthening and general body conditioning	0.0%	0.0%	16.7%	33.3%	50.0%	83.3%	4.33	4.50	5	.778
Kinesio-taping/ strapping	33.3%	16.7%	25.0%	16.7%	8.3%	25.0%	2.50	2.50	1	1.382
Laser	50.0%	16.7%	8.3%	0.0%	25.0%	25.0%	2.33	1.50	1	1.723
****Postnatal education and advice**	0.0%	8.3%	8.3%	25.0%	58.3%	83.3%	4.33	5.00	5	.985
*****Prenatal education and advice**	16.7%	8.3%	8.3%	16.7%	50.0%	66.7%	3.75	4.50	5	1.603
Scar tissue massage	8.3%	8.3%	8.3%	25.0%	50.0%	75.0%	4.00	4.50	5	1.348
TENS	33.3%	16.7%	33.3%	16.7%	0.0%	16.7%	2.33	2.50	1*	1.155
Trigger point therapy	16.7%	33.3%	25.0%	16.7%	8.3%	25.0%	2.67	2.50	2	1.231
Ultrasound	58.3%	25.0%	8.3%	8.3%	0.0%	8.3%	1.67	1.00	1	.985

**when two or more modes exist the smaller number is presented*
*** Postnatal education and advice – precautions, ergonomics, kinetic handling and supported coughing*
*** Prenatal education and advice – precautions, ergonomics, kinetic handling and supported coughing

The results from Figure 8.14 illustrate that clinical experience was the most common reason stated by participants for selecting the treatment interventions, which was followed by literature.

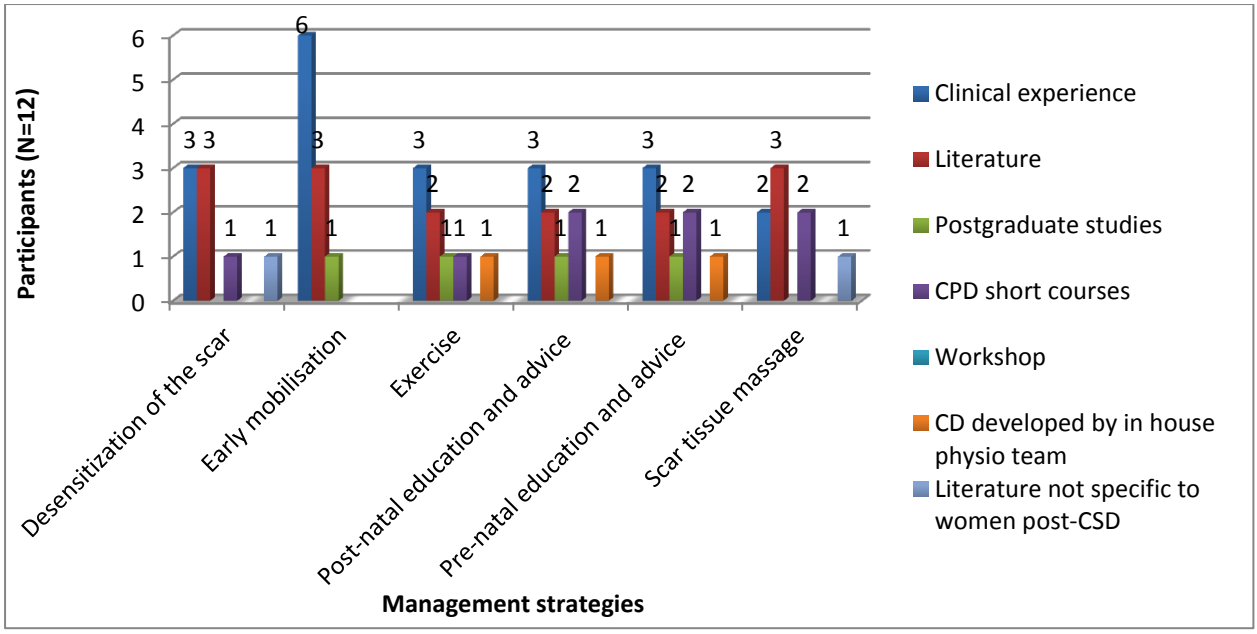


Figure 8.14: Reason(s) for selection of treatment techniques for patients with pain at the operation site post-CSD

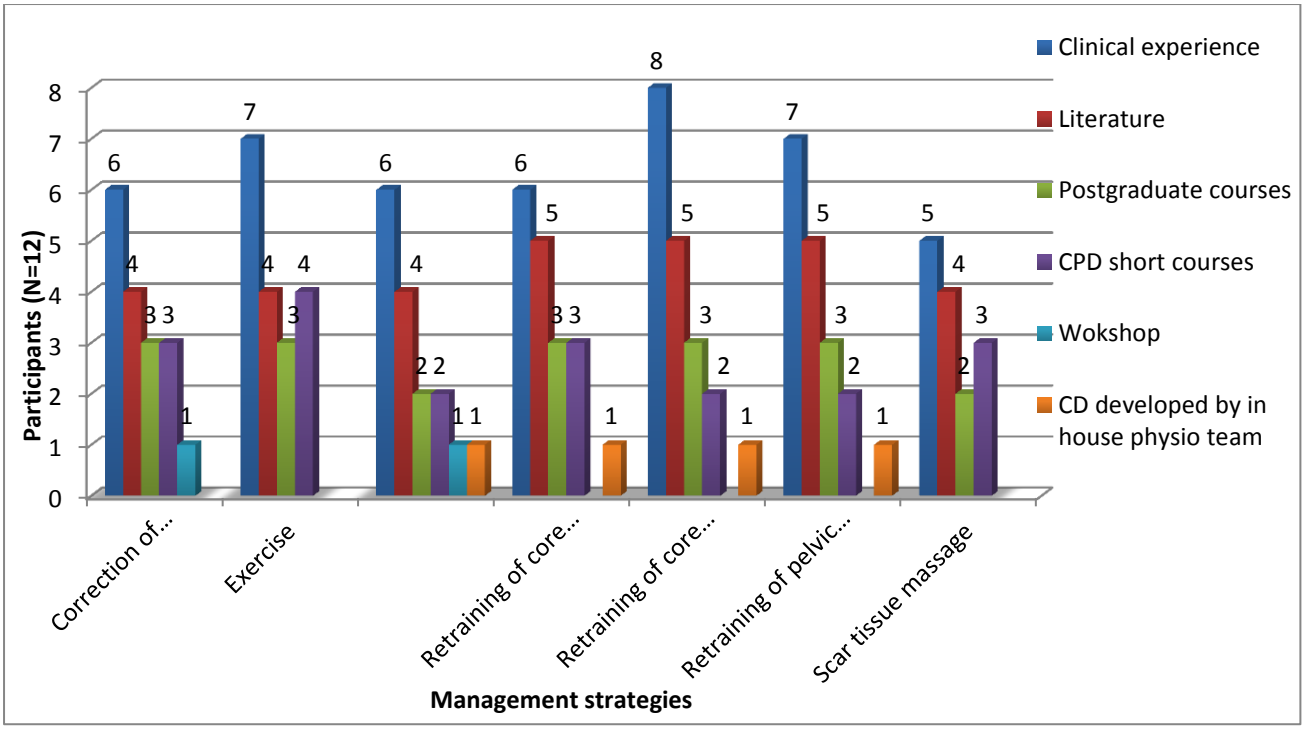
Table 8.3 shows that the treatment techniques with the highest levels of consensus and agreement selected by the participants to manage patients who struggled with vigorous activities were postnatal education and advice (100%), retraining (activation) core stabilisers (100%) followed by retraining (activation and strengthening) pelvic floor muscles (91.7%).

Table 8.3: Consensus on treatment strategies for patients who struggle with vigorous activities post-CSD

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Addressing foot pathologies	16.7%	41.7%	16.7%	25.0%	0.0%	25.0%	2.50	2.00	2	1.087
Correction of diastasis recti	8.3%	8.3%	16.7%	33.3%	33.3%	66.7%	3.75	4.00	4*	1.288
****Exercise**	8.3%	0.0%	8.3%	41.7%	41.7%	83.3%	4.08	4.00	4*	1.165
Postnatal education and advice	0.0%	0.0%	0.0%	16.7%	83.3%	100%	4.83	5.00	5	.389
Retraining (activation and strengthening) of PFM	0.0%	0.0%	8.3%	16.7%	75.0%	91.7%	4.67	5.00	5	.651
Retraining (activation) of core stabilisers	0.0%	0.0%	0.0%	25.0%	75.0%	100%	4.75	5.00	5	.452
Retraining of core mobilizers	8.3%	0.0%	16.7%	25.0%	50.0%	75.0%	4.08	4.50	5	1.240
Scar tissue massage	16.7%	8.3%	16.7%	33.3%	25.0%	58.3%	3.42	4.00	4	1.443

**when two or more modes exist the smaller number is presented*
*** Exercise: lower limb strengthening and general body conditioning*

The main reason for selecting the techniques in Table 8.3, which had the highest levels of consensus and agreement, was clinical experience, which was followed by information being obtained from literature (Figure 8.15),



*Retraining (activation) of core stabilizers
**Retraining (activation and strengthening) of pelvic floor muscles

Figure 8.15: Reason(s) for selection of treatment techniques for patients who struggle with vigorous activities post-CSD

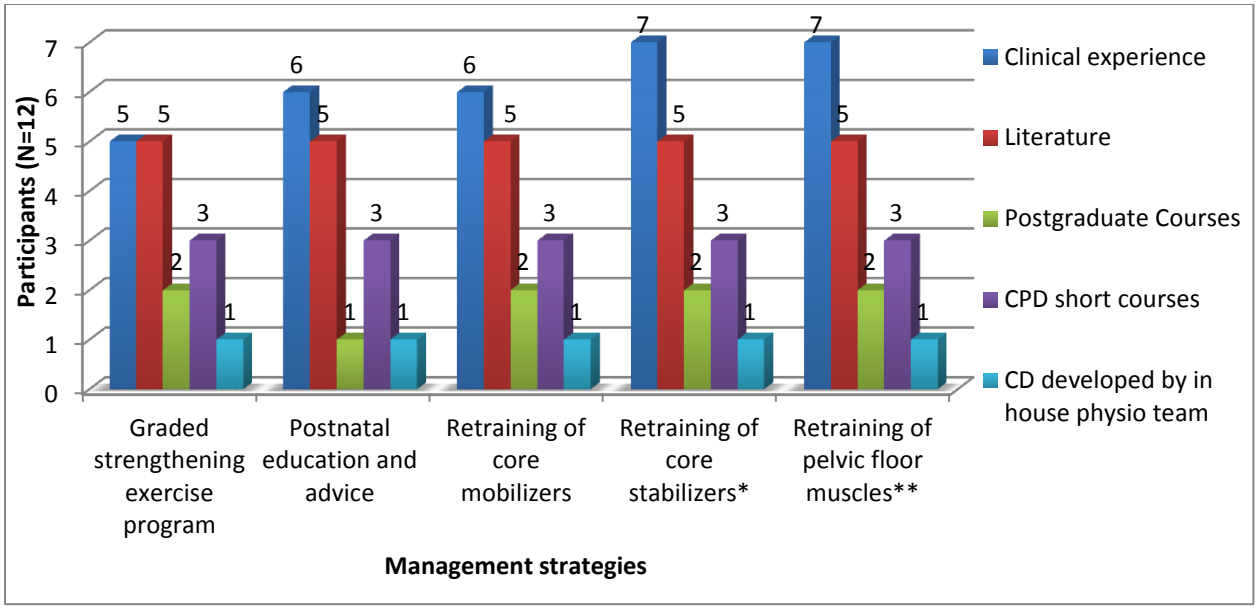
The results indicated that postnatal education and advice (91.7%), retraining (activation and strengthening) pelvic floor muscles (91.7%) and retraining (activation) core stabilisers (91.7%) had the highest levels of agreement and consensus by participants to manage patients who struggle with bending, kneeling and stooping (Table 8.4).

Table 8.4: Consensus on treatment strategies for patients who struggle with bending, kneeling and stooping post-CSD

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Graded strengthening exercise program	8.3%	0.0%	16.7%	33.3%	41.7%	75.0%	4.00	4.00	5	1.206
Postnatal education and advice	8.3%	0.0%	0.0%	16.7%	75.0%	91.7%	4.50	5.00	5	1.168
Referral to occupational therapy for assessment and suitable devices	33.3%	25.0%	33.3%	8.3%	0.0%	8.3%	2.17	2.00	1*	1.030
Retraining (activation and strengthening) pelvic floor muscles	8.3%	0.0%	0.0%	33.3%	58.3%	91.7%	4.33	5.00	5	1.155
Retraining (activation) core stabilizers	8.3%	0.0%	0.0%	16.7%	75.0%	91.7%	4.50	5.00	5	1.168
Retraining core mobilisers	8.3%	0.0%	8.3%	25.0%	58.3%	83.3%	4.25	5.00	5	1.215
Teaching the 'Knack" maneuver	33.3%	8.3%	16.7%	25.0%	16.7%	41.7%	2.83	3.00	1	1.614
Temporary soft supportive brace for overweight patients	25.0%	33.3%	25.0%	16.7%	0.0%	16.7%	2.33	2.00	2	1.073

**when two or more modes exist the smaller number is presented*

The results illustrate that clinical experience was the most common reason mentioned for selecting a treatment technique except for a "graded strengthening exercise programme", where clinical experience was supported by information obtained from relevant literature (Figure 8.16).



**Retraining (activation) of core stabilizers*
***Retraining (activation and strengthening) of pelvic floor muscles*

Figure 8.16: Reason(s) for selection of treatment techniques for patients struggling with bending, kneeling and stooping post-CSD

In managing patients who experience urinary incontinence post-CSD, Table 8.5 shows that numerous strategies were selected. However, those that had 100% level of agreement and the highest level of consensus were postnatal education, advice on bowel and bladder activity, and retraining (activation and strengthening) pelvic floor muscles. This was followed by retraining (activation) core stabilisers (91.7%).

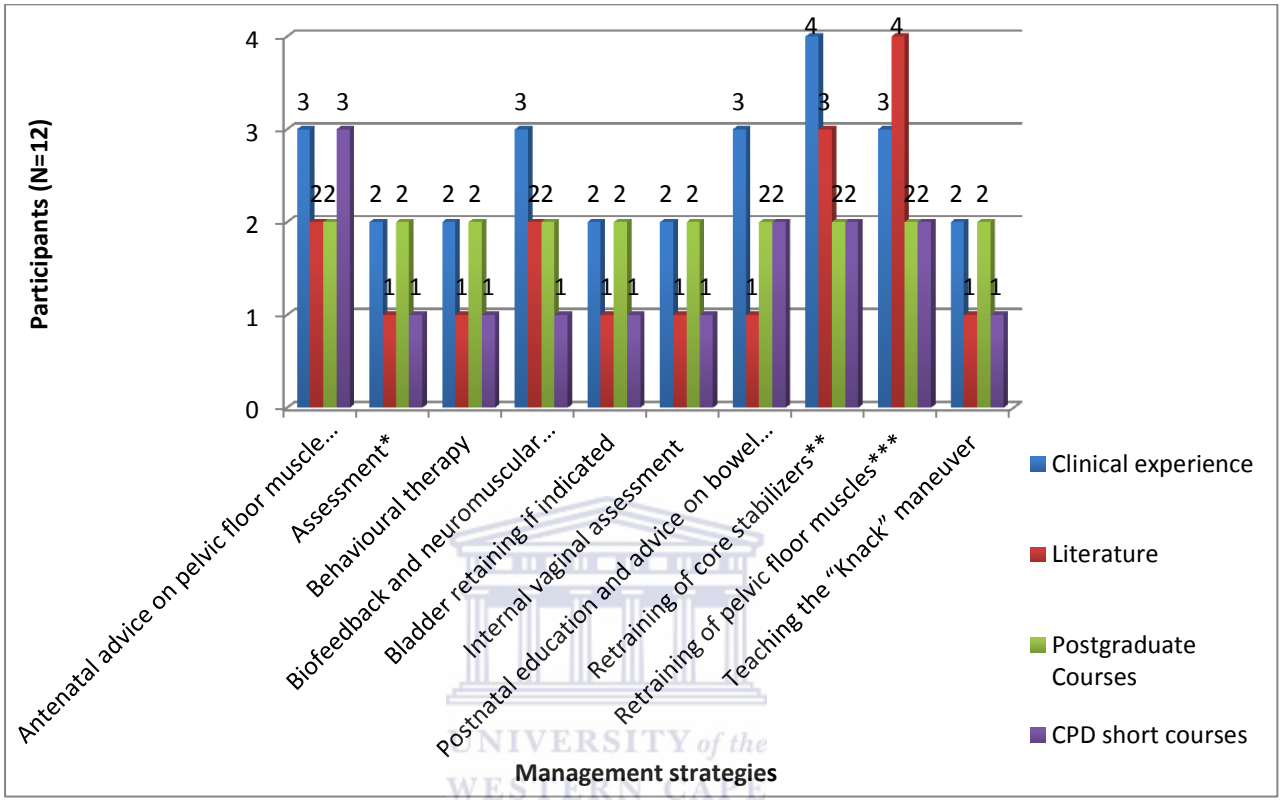
Table 8.5: Consensus on treatment strategies for patients with urinary incontinence post-CSD

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Antenatal advice on pelvic floor muscle training	16.7%	0.0%	0.0%	16.7%	66.7%	83.3%	4.17	5.00	5	1.528
***Assessment**	25.0%	0.0%	8.3%	8.3%	58.3%	66.7%	3.75	5.00	5	1.765
Behavioural therapy	16.7%	0.0%	16.7%	16.7%	50.0%	66.7%	3.83	4.50	5	1.528
Biofeedback and neuromuscular stimulation of PFM	16.7%	0.0%	25.0%	41.7%	16.7%	58.3%	3.42	4.00	4	1.311
Bladder retraining if indicated	16.7%	0.0%	8.3%	8.3%	66.7%	75.0%	4.08	5.00	5	1.564
Internal vaginal assessment prior to treatment	25.0%	16.7%	0.0%	25.0%	33.3%	58.3%	3.25	4.00	5	1.712
****Postnatal education and advice**	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Retraining (activation and strengthening) pelvic floor muscles	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Retraining (activation) core stabilizers	0.0%	0.0%	8.3%	33.3%	58.3%	91.7%	4.50	5.00	5	.674
Retraining of core mobilizers	16.7%	33.3%	16.7%	8.3%	25.0%	33.3%	2.92	2.50	2	1.505
Teaching the 'Knack" manoeuver	8.3%	0.0%	16.7%	16.7%	58.3%	75.0%	4.17	5.00	5	1.267
Temporary soft supportive brace for overweight patients	50.0%	8.3%	33.3%	0.0%	8.3%	8.3%	2.08	1.50	1	1.311

** Assessment to determine if the problem is urge or stress incontinence including a bladder diary*
*** Postnatal education and advice on bowel and bladder activity*

Although clinical experience was the most common reason stated by participants for the majority of the treatments, it is equal to or surpassed by CPD short courses and literature respectively in two treatment techniques (antenatal advice, as well as

postnatal education and advice) (Figure 8.17). This suggests that CPD short courses and literature were not reported as major contributory factors to knowledge in this area.



**Assessment -to determine if the problem is urge or stress incontinence including a bladder diary*
***Retraining (activation) of core stabilizers*
****Retraining (activation and strengthening) of pelvic floor muscles*

Figure 8.17: Reason(s) for selection of treatment techniques for patients with urinary incontinence post-CSD

Table 8.6 shows that for the treatment of patients with lower back pain post-CSD, postnatal advice on ergonomics and kinetic handling (incl. baby handling) (100%) followed by motor control exercises was preferred (91.7%).

Table 8.6: Consensus on treatment strategies for patients with lower back pain post-CSD

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Abdomino-pelvic muscle synergy retraining	8.3%	0.0%	8.3%	16.7%	66.7%	83.3%	4.33	5.00	5	1.231
Electrotherapy	33.3%	8.3%	50.0%	0.0%	8.3%	8.3%	2.42	3.00	3	1.240
Kinesio-taping/ strapping	8.3%	33.3%	25.0%	16.7%	16.7%	33.4%	3.00	3.00	2	8.3
Motor control exercises	0.0%	0.0%	8.3%	8.3%	83.3%	91.7%	4.75	5.00	5	.622
Muscle energy technique	16.7%	25.0%	25.0%	16.7%	16.7%	33.4%	2.92	3.00	2*	1.379
****Postnatal advice**	0.0%	0.0%	0.0%	8.3%	91.7%	100.0%	4.92	5.00	5	.289
Soft tissue mobilization and myofascial release	0.0%	0.0%	25.0%	25.0%	50.0%	75.0%	4.25	4.50	5	.866
Spinal mobilization	0.0%	0.0%	25.0%	25.0%	50.0%	75.0%	4.25	4.50	5	.866
Trigger point therapy	0.0%	0.0%	25.0%	25.0%	50.0%	75.0%	4.25	4.50	5	.866

**when two or more modes exist the smaller number is presented*
***Postnatal advice on ergonomics and kinetic handling (incl. baby handling)*

The results in Figure 8.18 illustrate that clinical experience was the most common reason stated for selecting treatment techniques for three of the treatments, following which, it was tied with literature, postgraduate courses or CPD courses.

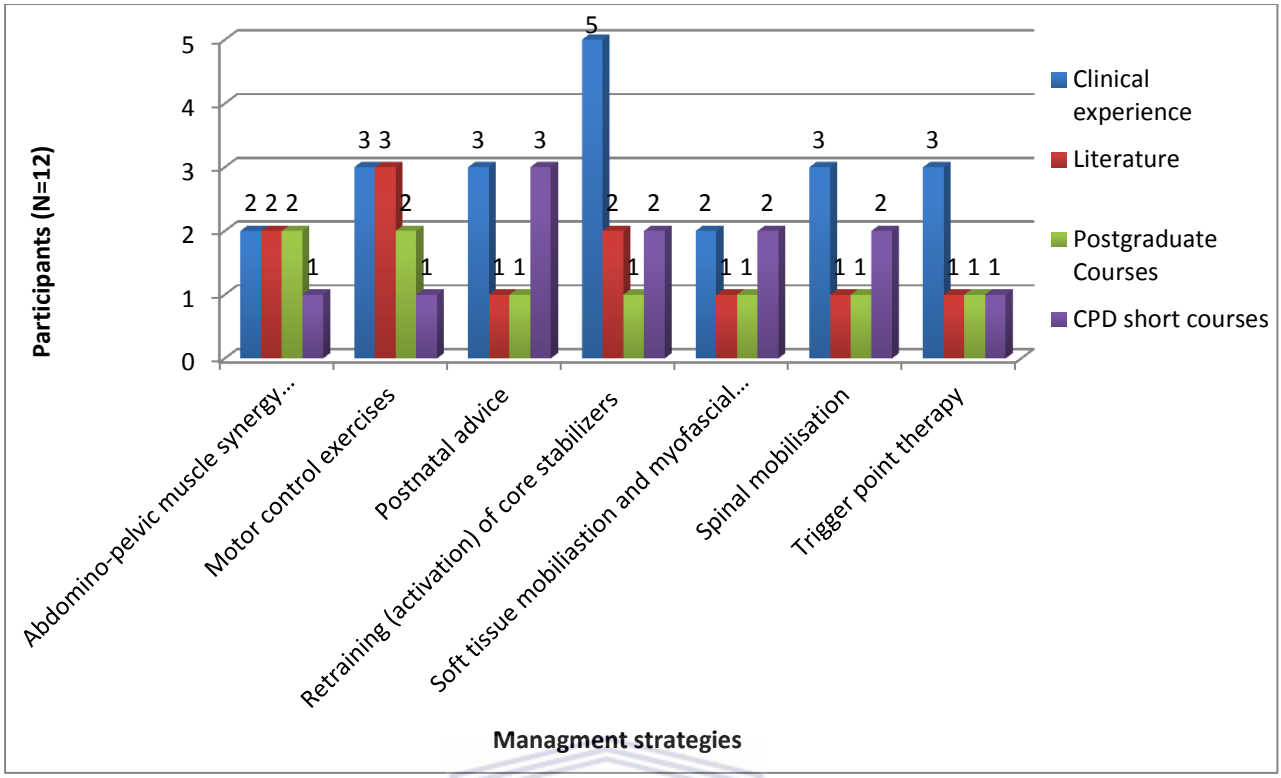


Figure 8.18: Reason(s) for selection of treatment techniques for patients with lower back pain post-CSD

In terms of other treatment strategies that should be rendered to patients post-CSD, the results in Table 8.7 indicate that only two of the strategies posed to the panel were selected. Postnatal advice and education (100%) were the strategy with the highest consensus and level of agreement (5), followed by advice on breast-feeding (75%).

Table 8.7: Consensus on other treatment strategies for patients post-CSD

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Advice on breast-feeding	8.3%	8.3%	8.3%	33.3%	41.7%	75.0%	3.92	4.00	5	1.311
Advice on hemorrhoids	8.3%	33.3%	16.7%	25.0%	16.7%	41.7%	3.08	3.00	2	1.311
Advice on sexual problems	33.3%	8.3%	16.7%	16.7%	25.0%	41.7%	2.92	3.00	1	1.676
Education and advice on postnatal depression	33.3%	0.0%	33.3%	25.0%	8.3%	33.3%	3.08	3.00	2	.996
Postnatal advice and education	0.0%	0.0%	0.0%	16.7%	83.3%	100%	4.83	5.00	5	.389

Figure 8.19 indicates that clinical experience was the most common reason stated for selecting postnatal advice as a treatment strategy, while for advice on breast-feeding, the results were tied between clinical experience, literature and postgraduate courses.

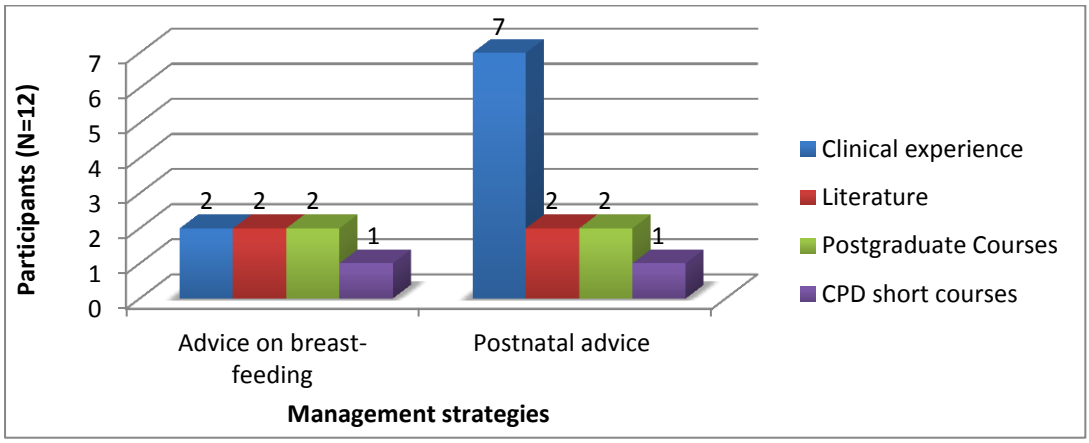


Figure 8.19: Reason(s) for selection of "other" treatment techniques for patients post-CSD

b) Management strategies for patients post hysterectomy

Management strategies for patients with postoperative pain at the incision site post hysterectomy showed that the highest consensus (5) and level of agreement (91.7%) were for postoperative education and advice, which was followed by exercise (83.3%) (Table 8.8).

Table 8.8: Consensus on treatment strategies for patients with pain at the operation site post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Desensitization of the scar	16.7 %	8.3%	8.3%	41.7%	25.0%	66.7%	3.50	4.00	4	1.446
***Exercise**	8.3%	0.0%	8.3%	16.7%	66.7%	83.3%	4.33	5.00	5	1.231
Ice	33.3%	25.0%	8.3%	16.7%	16.7%	33.3%	2.58	2.00	1	1.564
Kinesio-taping/ strapping	41.7%	0.0%	33.3%	8.3%	16.7%	25.0%	2.58	3.00	1	1.564
Laser	33.3%	25.0%	16.7%	8.3%	16.7%	25.0%	2.50	2.00	1	1.508
****Postoperative education and advice**	8.3%	0.0%	0.0%	8.3%	83.3%	91.7%	4.58	5.00	5	1.165
Scar tissue massage	8.3%	8.3%	16.7%	50.0%	16.7%	66.7%	3.58	4.00	4	1.165
Temporary soft supportive brace for overweight patients	16.7%	33.3%	25.0%	16.7%	8.3%	25.0%	2.67	2.50	2	1.403
TENS	16.7%	33.3%	16.7%	16.7%	16.7%	33.4%	2.83	2.50	2	1.403
Trigger point therapy	25.0%	16.7%	16.7%	33.3%	8.3%	41.7%	2.83	3.00	4	1.403
Ultrasound	41.7%	8.3%	25.0%	8.3%	16.7%	25.0%	2.50	2.50	1	1.567

** Exercise: abdominal muscle strengthening and general body conditioning*
***Postoperative education and advice comprises of ergonomics, kinetic handling and supported coughing*

Figure 8.20 illustrates that clinical experience was the most common reason stated by participants for selecting the treatment techniques, which was followed by a tie among literature, postgraduate courses and CPD courses for several of the treatment techniques.

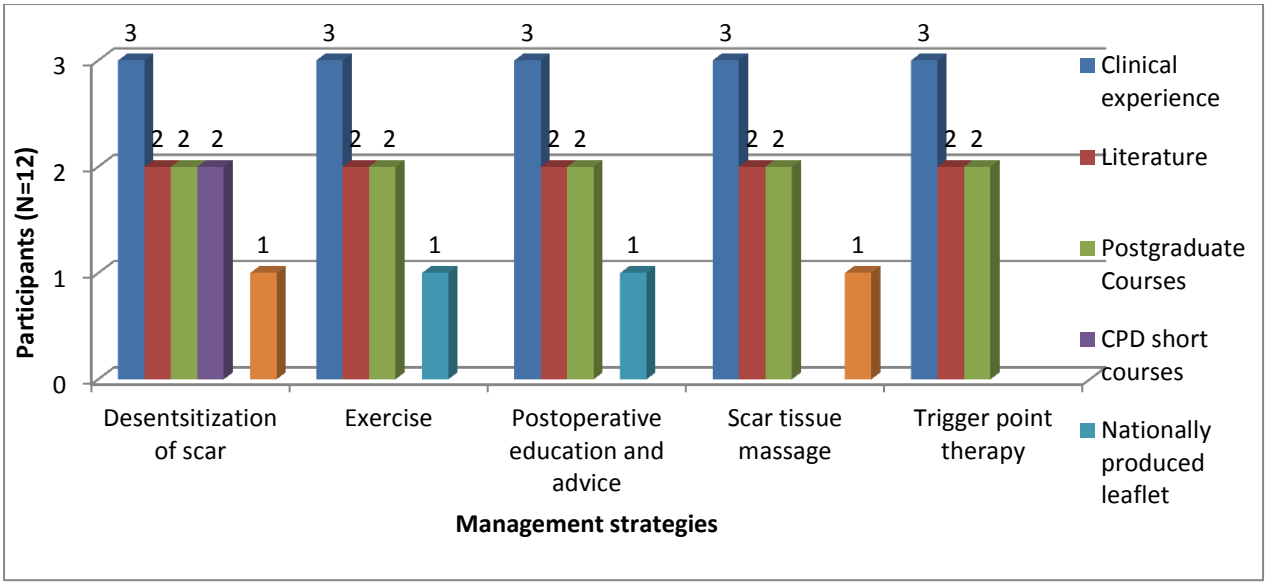


Figure 8.20: Reason(s) for selection of treatment techniques for patients with pain at the operation site post hysterectomy

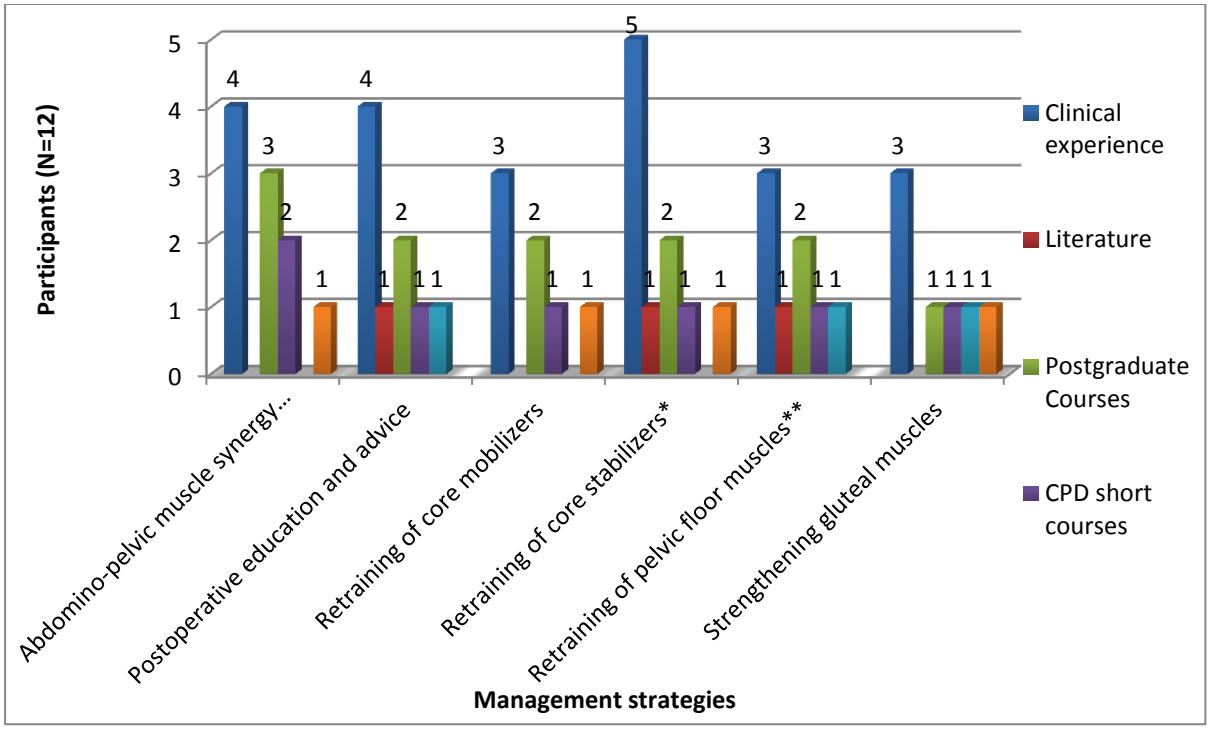
To manage patients who struggle with vigorous activities post hysterectomy, the results showed that postoperative education and advice (100%) and retraining (activation) of core stabilizers (100%) were the treatment techniques agreed upon. This was followed by retraining (activation and strengthening) of pelvic floor muscles (83.3%) (Table 8.9).

Table 8.9: Consensus on treatment strategies for patients who struggle with vigorous activities post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Postoperative education and advice**	0.0%	0.0%	0.0%	16.7%	83.3%	100.0%%	4.83	5.00	5	.389
Abdomino-pelvic muscle synergy retraining	8.3%	0.0%	16.7%	33.3%	41.7%	75.0%	4.00	4.00	5	1.206
Kinesio-taping/ strapping	33.3%	25.0%	25.0%	0.0%	16.7%	16.7%	2.42	2.00	1	1.443
Retraining (activation and strengthening) of PFM	0.0%	0.0%	16.7%	16.7%	66.7%	83.3%	4.50	5.00	5	.798
Retraining (activation) of core stabilizers	0.0%	0.0%	0.0%	25.0%	75.0%	100.0%	4.75	5.00	5	.452
Retraining of core mobilizers	8.3%	0.0%	16.7%	33.3%	41.7%	75.0%	4.00	4.00	5	1.206
Scar and soft tissue massage	8.3%	33.3%	16.7%	25.0%	16.7%	41.7%	3.08	3.00	2	1.311
Strengthening gluteal muscles	0.0%	0.0%	25.0%	33.3%	41.7%	75.0%	4.17	4.00	5	.835
Temporary soft supportive brace for overweight patients	16.7%	33.3%	33.3%	8.3%	8.3%	16.7%	2.58	2.50	2*	1.165

**when two or more modes exist the smaller number is presented*
***Postoperative education and advice comprises of ergonomics, kinetic handling, breathing, bracing and supported coughing*

The results indicate that clinical experience was the most common reason stated for all the treatment techniques selected for patients who struggled with vigorous activities (Figure 8.21). While not as noteworthy, postgraduate courses were indicated by some participants.



**Retraining (activation) of core stabilizers*
***Retraining (activation and strengthening) of pelvic floor muscles*

Figure 8.21: Reason(s) for selection of treatment techniques for patients who struggle with vigorous activities post hysterectomy

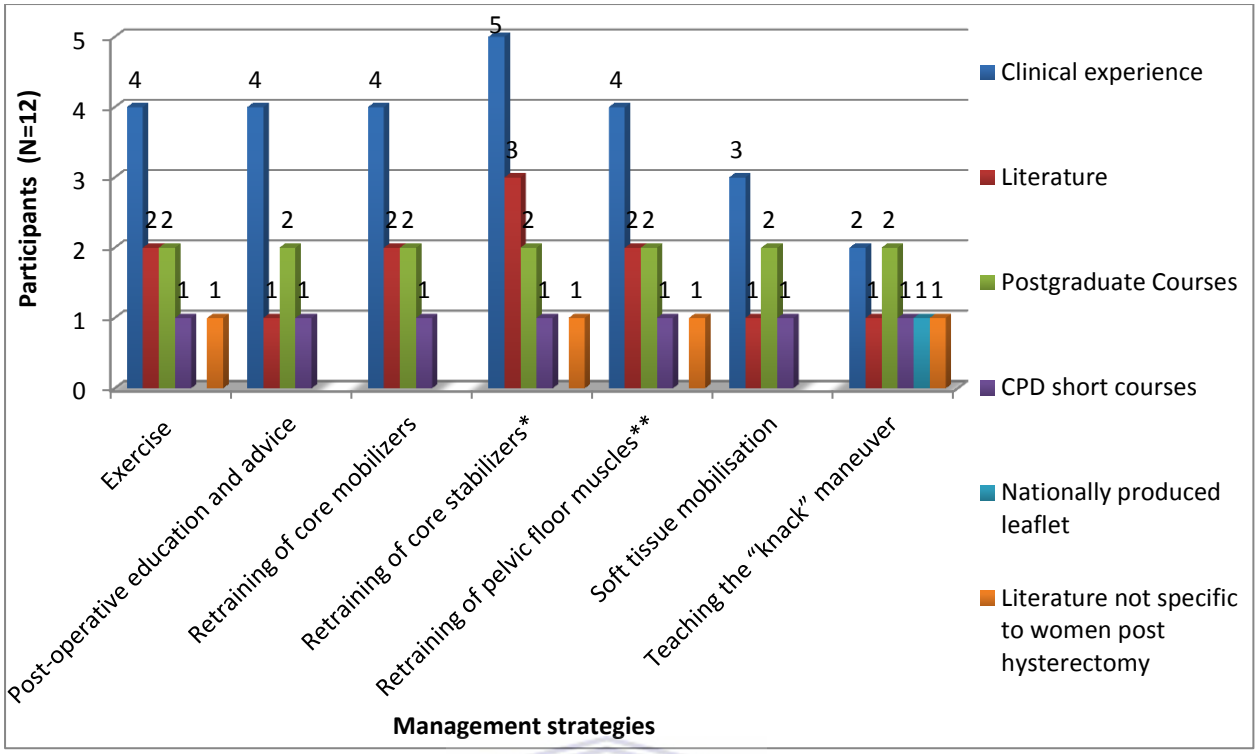
Table 8.10 shows that retraining (activation) core stabilisers had the highest rate of consensus (5) and level of agreement (100%) for managing patients who struggled with bending, kneeling and stooping. This was followed by, postoperative education and advice (91.7%) and an exercise programme comprising of strengthening the gluteal muscles and general body (91.7%).

Table 8.10: Consensus on treatment strategies for patients who struggle with bending, kneeling and stooping post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Biofeedback for training of the PFM	41.7%	8.3%	16.7%	25.0%	8.3%	33.3%	2.50	2.50	1	1.508
Bladder retraining if indicated	33.3%	0.0%	16.7%	25.0%	25.0%	50.0%	3.08	3.50	1	1.676
***Exercise program**	0.0%	0.0%	8.3%	41.7%	50.0%	91.7%	4.42	4.50	5	.669
****Postoperative education and advice**	0.0%	0.0%	8.3%	33.3%	58.3%	91.7%	4.50	5.00	5	.674
Retraining (activation and strengthening) of PFM	0.0%	0.0%	16.7%	25.0%	58.3%	83.3%	4.42	5.00	5	.793
Retraining (activation) of core stabilizers	0.0%	0.0%	0.0%	8.3%	91.7%	100.0%	4.92	5.00	5	.289
Retraining of core mobilizers	8.3%	0.0%	8.3%	25.0%	58.3%	83.3%	4.25	5.00	5	1.215
Soft tissue mobilization	16.7%	16.7%	16.7%	16.7%	33.3%	50.0%	3.33	3.50	5	1.557
Teaching the 'Knack" maneuver	25%	0.0%	25.0%	16.7%	33.3%	50.0%	3.33	3.50	5	1.614

** Exercise program: strengthening of gluteal muscles and general body*
***Postoperative advice and education comprises: ergonomics, kinetic handling, deep breathing and supported coughing*

Clinical experience was the most commonly stated reason by participants for selecting the proposed treatment techniques except for teaching the "knack" maneuver where postgraduate courses was also stated as a reason (Figure 8.22).



Retraining (activation) of core stabilizers
***Retraining (activation and strengthening) of pelvic floor muscles*

Figure 8.22: Reason(s) for selection of treatment techniques for patients who struggle with bending, kneeling and stooping post hysterectomy

Consensus was achieved in all the treatment strategies presented to the panel for treating patients with urinary incontinence post hysterectomy, but, a 100% level of agreement was achieved for postoperative education and advice, retraining (activation and strengthening) pelvic floor muscles and retraining (activation) core stabilisers (Table 8.11).

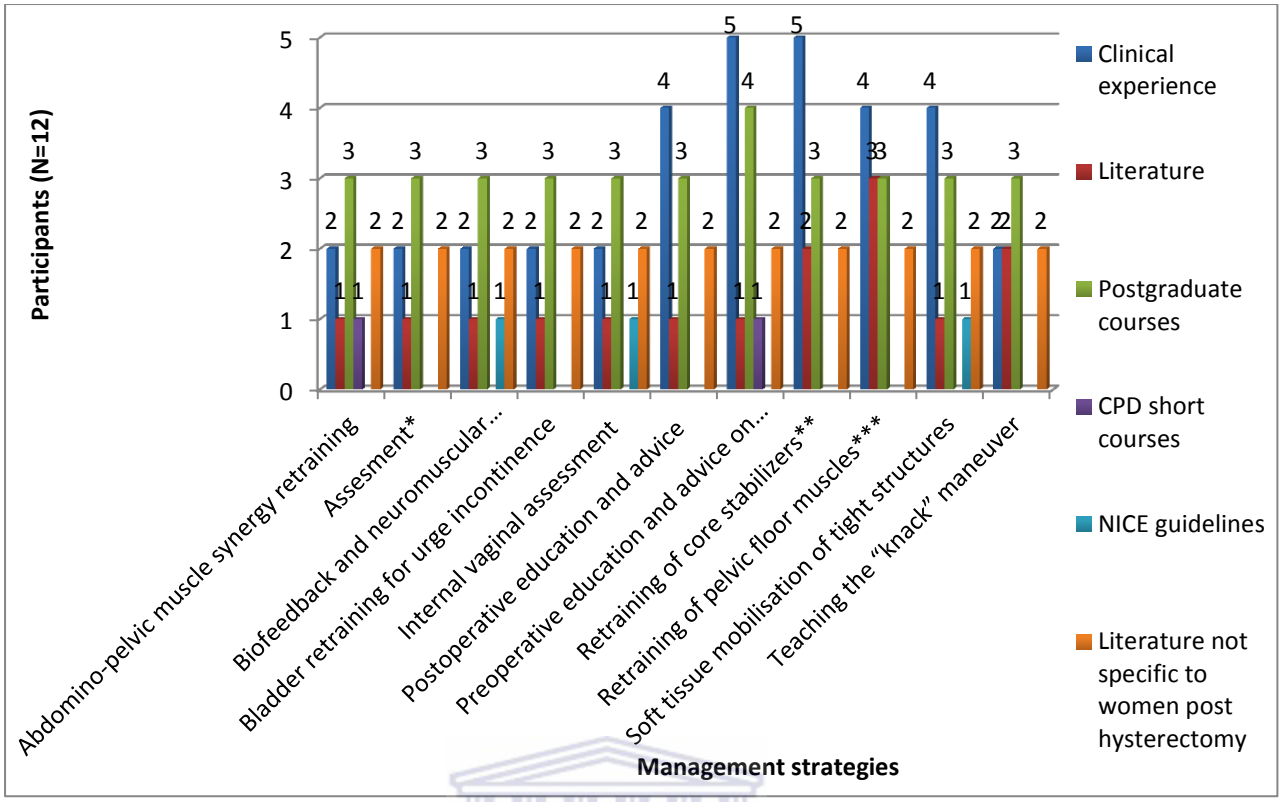
Table 8.11: Consensus on treatment strategies for patients with urinary incontinence post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Abdomino-pelvic muscle synergy retraining	8.3	0.0	8.3	25.0	58.3	83.3	4.25	5.00	5	1.215
****Assessment**	16.7	0.0	16.7	0.0	66.7	66.7	4.00	5.00	5	1.595
Biofeedback and neuromuscular stimulation of PFM	16.7	0.0	16.7	33.3	33.3	66.7	3.67	4.00	4*	1.435
Bladder retraining for urge incontinence	16.7	0.0	8.3	8.3	66.7	75.0	4.08	5.00	5	1.564
Internal vaginal assessment prior to treatment	16.7	8.3	16.7		58.3	58.3	3.75	5.00	5	1.658
Postoperative education and advice	0.0	0.0	0.0	8.3	91.7	100.0	4.92	5.00	5	.289
Pre-operative education and advice on PFM exercises	8.3	0.0	8.3	16.7	66.7	83.3	4.33	5.00	5	1.231
Retraining (activation and strengthening) of PFM	0.0	0.0	0.0	8.3	91.7	100.0	4.92	5.00	5	.289
Retraining (activation) of core stabilizers	0.0	0.0	0.0	16.7	83.3	100.0	4.83	5.00	5	.389
Soft tissue mobilization if tight structures	8.3	0.0	33.3	16.7	41.7	58.3	3.83	4.00	5	1.267
Teaching the 'Knack" maneuver	16.7	0.0	8.3	8.3	66.7	75.0	4.08	5.00	5	1.564

**When two or more modes exist the smaller number is presented*

*** Assessment to determine if the problem is urge or stress incontinence including a bladder diary*

Regarding treating women with urinary incontinence post hysterectomy, the majority of participants stated that attending postgraduate courses was the reason for selecting the proposed treatment technique(s). This was surpassed by clinical experience in several of the other treatment techniques (Figure 8.23).



**Assessment -to determine if the problem is urge or stress incontinence including a bladder diary*
****Retraining (activation) of core stabilizers*
***Retraining (activation and strengthening) of pelvic floor muscle*

Figure 8.23: Reason(s) for selection of treatment techniques for patients with urinary incontinence post hysterectomy

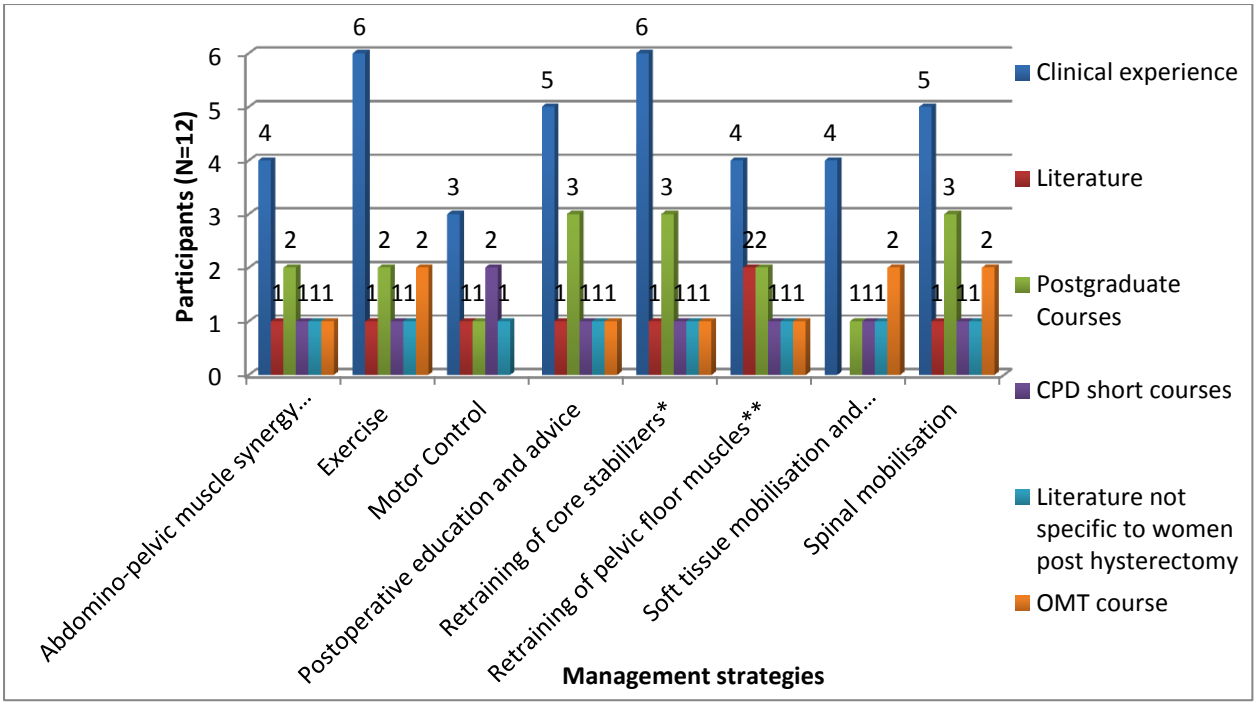
In managing patients with lower back pain post hysterectomy, it was visible in Table 8.12 that preoperative education, advice and strengthening, postoperative education and advice, and retraining (activation) core stabilisers had the highest level of agreement at 100% and level of consensus of 5. This was followed by abdomino-pelvic muscle synergy retraining (91.7), exercise: lower-limb strengthening and general body conditioning (91.7%) and spinal mobilisation (91.7%).

Table 8.12: Consensus on treatment strategies for patients with lower back pain post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Abdomino-pelvic muscle synergy retraining	8.3%	0.0%	0.0%	33.3%	58.3%	91.7	4.33	5.00	5	1.155
Electrotherapy	33.3%	16.7%	25.0%	8.3%	16.7%	25.0%	2.58	2.50	1	1.505
Exercise: lower limb strengthening and general body conditioning	0.0%	0.0%	8.3%	33.3%	58.3%	91.7%	4.50	5.00	5	.674
Motor control	0.0%	0.0%	16.7%	33.3%	50.0%	83.3%	4.33	4.50	5	.778
Neural mobilization	33.3%	0.0%	25.0%	25.0%	16.7%	41.7%	3.25	3.00	2	1.138
***Postoperative education and advice**	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Preoperative education, advice and strengthening	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Retraining (activation and strengthening) of pelvic floor muscles	0.0%	0.0%	8.3%	25.0%	66.7%	91.7%	4.58	5.00	5	.669
Retraining (activation) of core stabilizers	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Soft tissue mobilization and myofascial release	0.0%	0.0%	16.7%	33.3%	50.0%	83.3%	4.33	4.50	5	.778
Spinal mobilization	0.0%	0.0%	8.3%	50.0%	41.7%	91.7%	4.33	4.00	4	.651

**Postoperative education and advice comprising of ergonomics and kinetic handling*

Figure 8.24 illustrates that clinical experience was a frequent reason for all the treatment techniques selected in managing patients with lower back pain post hysterectomy.



***Retraining (activation) of core stabilizers*
**Retraining (activation and strengthening) of pelvic floor muscles*

Figure 8.24: Reason(s) for selection of treatment techniques for patients with lower back pain post hysterectomy

The panel agreed on all the treatment techniques presented to manage patients with lower limb swelling post hysterectomy. However, again, advice on positioning and encouraging early mobilisation had the highest level of agreement at 100%, which was followed by exercises: circulatory drills and general range of movement (ROM) exercises (Table 8.13).

Table 8.13: Consensus on treatment strategies for patients with lower limb swelling post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Advice on positioning	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Encouraging early mobilization	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	.289
Exercises: circulatory drills and general ROM exercises	0.0%	0.0%	8.3%	16.7%	75.0%	91.7%	4.67	5.00	5	.651
Lymphatic drainage	8.3%	8.3%	16.7%	16.7%	50.0%	66.7%	3.92	4.50	5	1.379
Prescribing anti-embolism stockings	0.0%	0.0%	25.0%	25.0%	50.0%	75.0%	4.25	4.50	5	.866
Referral to the appropriate member of the multidisciplinary team needed	0.0%	0.0%	8.3%	0.0%	91.7%	91.7%	4.83	5.00	5	.577

The results indicated that clinical experience and literature was stated by most participants as the reasons for selecting their treatment techniques (Figure 8.25).

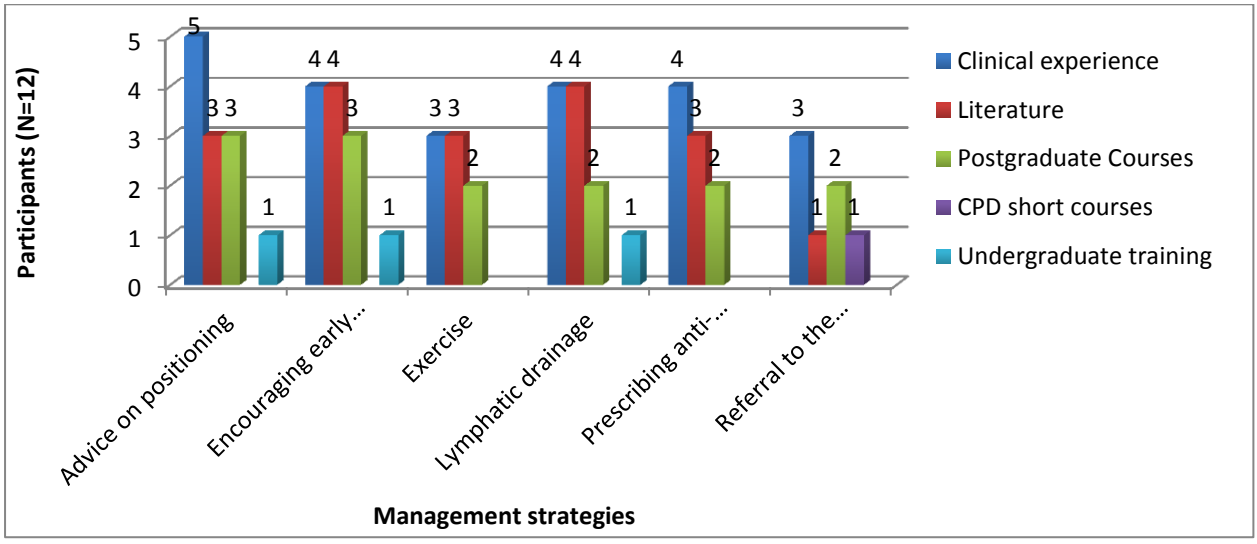


Figure 8.25: Reason(s) for selection of treatment techniques for patients with lower limb swelling post hysterectomy

In terms of other treatment strategies that should be used for patients post hysterectomy, the results indicated that early mobilisation was the strategy with the highest consensus (5) and level of agreement (100%), followed by preoperative counselling (91.7%) (Table 8.14).

Table 8.14: Consensus on "other" treatment strategies for patients post hysterectomy

	Very unlikely	Unlikely	Neutral	Likely	Very likely	Level of agreement	Mean	Median	Mode	SD (±)
Advice on attending a support group	25.0%	8.3%	8.3%	25.0%	33.3%	58.3%	3.33	4.00	5	1.670
Early mobilization	0.0%	0.0%	0.0%	8.3%	91.7%	100%	4.92	5.00	5	0.289
Education on early menopausal changes	25.0%	0.0%	8.3%	8.3%	58.3%	66.7%	3.75	5.00	5	1.765
Preoperative counseling	8.3%	0.0%	0.0%	25.0%	66.7%	91.7%	4.50	5.00	5	.905

Clinical experience was the most frequent reason stated by participants for selecting all the "other" treatment strategies to be part of the management plan for patients post hysterectomy (Figure 8.26).

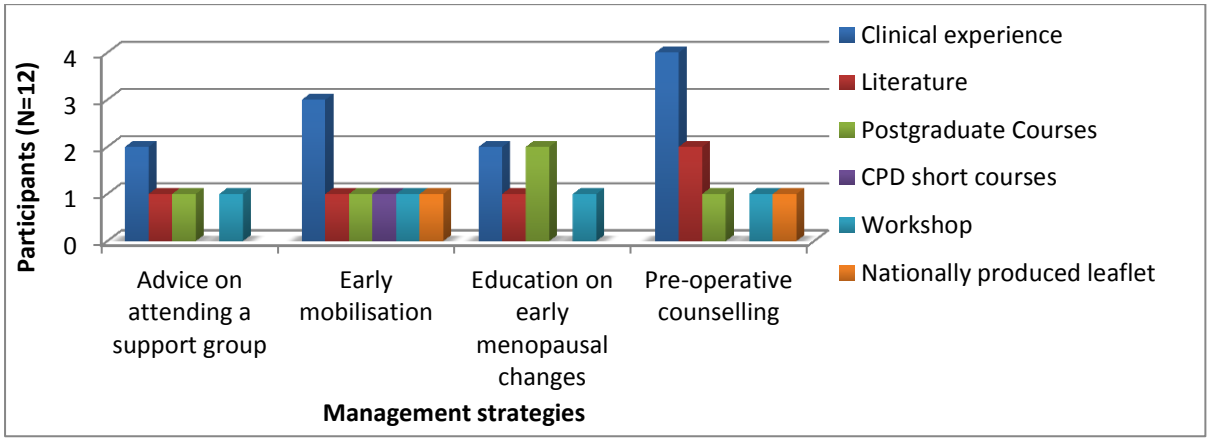


Figure 8.26: Reason(s) for selection "other" treatment strategies for patients post hysterectomy

8.3 DISCUSSION

Due to the lack of research studies to provide high-level evidence for post-operative physiotherapy interventions, the purpose of this phase was to provide clinical expert evidence for the management strategies, to support the development of clinical guidelines for HIV-infected and HIV non-infected women post caesarean section and hysterectomy. Although there were no differences in the type of complications experienced between the groups, the HIV-infected group took longer to recover postoperatively from the majority of the complications. The treatment techniques suggested by the participants for the HIV groups were the same, indicating that one clinical guideline would suffice for both HIV-infected and non-infected women post-CSD and one for HIV-infected and non-infected women post hysterectomy.

The socio-demographic section of the study showed that there was a large difference in the number of years of experience between the participants. This was initially thought to result in participants with less experience being unable to adequately identify suitable management techniques (Hsu & Standford, 2007). However, it has been stated that in terms of selecting a panel, there are no set criteria, and the selection is usually dependent on the disciplinary area of expertise required for that specific issue (Hsu & Standford, 2007). Other criteria for selecting panel members would be those who have somewhat similar backgrounds in the area, are willing to contribute, and are prepared revise their previous judgment to reach consensus (Pill, 1971). The area of women's health in physiotherapy in South Africa is still a fairly new field of interest, supporting the anticipation of a wide range of experience, which was represented in the results. Furthermore, 50% (n=6) of the participants who fell into the 1-5 years of experience category were South African, with only one participant from South Africa having > 20 years' experience, the remaining two participants with > 20 years' experience being from the United Kingdom. In terms of the impact on this study, the results provided a slightly wider variety of techniques with the "less experienced" physiotherapists more likely to suggest techniques based on a combination of courses attended, undergraduate training, clinical experience or evidence-based studies reported in the literature that (albeit not specific to this group was specific to the complication being treated). There has been increased emphasis on the teaching skills needed to implement evidence-based research in practice in short courses and at an undergraduate level in the profession (Jette, 2003). This, combined with younger physiotherapists being more confident with computer skills, and

searching for on-line journal articles, suggests that if adequately trained, younger physiotherapists do incorporate evidence-based methods (Jette, 2003).

The results obtained from the first round of the survey showed that a number of techniques were suggested by the panel members that could be used to treat or prevent the complications presented from Phase 1 of the study. The second round of the Delphi survey assisted in determining which of those treatment techniques or modalities would be most appropriate to manage women post caesarean section and hysterectomy, by means of consensus and level of agreement, which is discussed below. The findings show that the management strategies selected for both groups of patients were very similar. The responses in the discussion below will therefore be combined and differentiated where need be.

8.3.1 The physiotherapy management of patients with postoperative pain post caesarean section delivery and post hysterectomy

While a significant number of women who undergo a CSD suffer from postoperative pain at the incision site (Nikolajsen et al., 2004), there is no research in this area to prevent or manage their postoperative incision pain. The general consensus was that postnatal and postoperative education and advice should be given to patients, which was followed by exercise that included abdominal muscle strengthening and general body conditioning. Scar tissue massage was ranked third as a treatment strategy, and was followed by early mobilisation and scar desensitisation for patients post-CSD, and scar desensitisation and trigger-point therapy for patients post hysterectomy. What was noteworthy was in Round 1 of the survey, scar tissue massage was the most mentioned treatment, followed by exercise and laser post-CSD, while exercise was the most mentioned treatment followed by scar tissue massage and laser post hysterectomy. This suggests that participants reassessed their original view when presented with the views of the other panel members (Hsu & Standford, 2007).

Another point of note was that the majority of the panel members stated that they were either "unlikely" or "very unlikely" to use transcutaneous electrical nerve stimulation (TENS) for postoperative pain. A recent study has found that TENS was effective in reducing postoperative pain among women who underwent a caesarean section under general anesthetic (Karakaya et al., 2012). Similarly for patients post hysterectomy, despite there being no studies on the use of TENS directly for this cohort of women, research on the treatment of acute postoperative pain in patients post abdominal surgery was initially deemed

unclear (Carroll, Tramèr, McQuay, Nye & Moore, 1996). However a more robust systematic review by Bjordal, Johnson and Ljunggreen (2003) showed a significant reduction in analgesic consumption following the use of TENS, provided the correct technique and adequate stimulation were used. Although TENS has received mixed reviews as a treatment option, owing to small sample sizes and poor randomisation techniques for patients post-CSD (Bjersa & Andersson, 2014; Carroll et al, 1996) and there is no research that utilized TENS specifically for patients post hysterectomy, it is still considered useful as it has very few side effects (Bjordal et al., 2003; Rushton, 2002) making it ideal for women postpartum and post hysterectomy.

The inclusion of postnatal and postoperative advice and education comprising precautions, ergonomics, kinetic handling, and supported coughing, which is often based on anecdote and tradition (Minig, Trimble, Sarsotti, Sebastiani, Spong, 2009), comes across very strongly in all the results and not just for postoperative pain. Women often take on more household and caregiver responsibilities, which usually require them to be physically active (Minig et al., 2009). This illustrates the importance for health care professionals to include guiding the patient on when and how to resume these activities as part of their discharge advice, and on follow-up visits (American College of Obstetricians and Gynecologists, 1997), which the panel members recognised. This is key in the biopsychosocial model, in that by providing patients with a holistic approach to treatment, we improve their QoL and do not merely "cure" their aliments. This further highlights the need for physiotherapists to be involved from as early as possible in patient care, which can be achieved through establishing multidisciplinary patient manage teams.

The researcher found no evidence linking exercise to reducing postoperative pain, as well as desensitising a surgical scar post-CSD and post hysterectomy for postoperative pain, which is mainly considered for patients presenting with neuropathic pain (Schon et al., 2001). This treatment is in an area that requires further research, therefore clinicians should only consider this management technique for patients presenting with neuropathic type pain (Schon et al., 2001), which can be confirmed following a detailed assessment. Trigger-point therapy was also selected as a treatment technique for patients post hysterectomy, and although there is minimal research in this area, there has been documented evidence of pain resulting from trigger points in postoperative surgical scars (Cummings, 2003; Defalque, 1982) due to small scar-entrapped neuromas (Defalque, 1982), which probably would benefit from this therapy.

In terms of scar tissue massage and pain, there has been some documented proof of the effectiveness of scar tissue massage in post-surgical wounds following suture removal in a systematic review (Shin & Bordeaux, 2012). Despite the overall results being inconclusive due to a paucity of research, the authors hypothesised the physical and emotional benefits of scar tissue massage to post-surgical patients. Of importance to this study is the reduction of pain though scar tissue massage described using the effect of the pain gate theory, as defined in 1965 by Melzack and Wall (Shin & Bordeaux, 2012), which should also improve the functional ability of the patient.

8.3.2 The Physiotherapy management of patients with physical activities post caesarean section delivery and post hysterectomy

The treatment techniques selected for patients who struggled with physical activities, such as vigorous activities (e.g. lifting a table), bending, kneeling and stooping, were similar among panel members for patients post CSD and hysterectomy. The management strategy with the highest level of consensus and agreement was postnatal and postoperative advice and education, which was followed by retraining (activation) core stabilisers and retaining (activation and strengthening) pelvic floor muscles. Retraining core mobilisers and exercises comprising either a graded lower limb strengthening programme or general body conditioning also had high level of agreement and consensus. The majority of the selections were based on clinical experience, as there is no literature specifically for this cohort of patients. Some of the participants who did select literature stated that it was not specific to this group and that they had adapted the treatment to suit the patient.

While exploring the reasons for the poor physical functional levels was beyond the scope of the study, previous research has shown an association between postoperative pain and lifting heavy bags or a baby, in the case of postnatal women (Nikolajsen et al., 2004). Specific to patients post hysterectomy, most surgeons still advise their patients to avoid heavy lifting and strenuous activities at least three months post-surgery for fear of increasing intra-abdominal pressure, which may result in wound dehiscence and pelvic floor disorders (Greenburg, Saik & Peskin, 1979; Keill, Keitzer, Nichols, Henzel & DeWeese, 1973; Guiney, Morris & Donaldson, 1966; Hull & Hankins, 1955). However, there are no recent data to substantiate that this may still occur (Nygaard, Hamad & Shaw, 2013), especially due to the advances in operative techniques. Thus, educating a patient on the correct ergonomics and kinetic

handling is still considered essential (Minig et al., 2009), as it may assist in reducing postoperative pain, thereby improving the patient's functional level.

The recruitment and strengthening of the abdominal muscle complex and pelvic floor muscles was also considered important to assist patients in completing tasks (Minig et al., 2009; Sapsford, 2004). Teaching the patients to recruit the core muscles will further assist women when performing functional activities, as women tend to avoid movement that results in abdominal muscle contraction for fear of pain following abdominal surgery. This may result in "trick" movements that could also be a reason for being unable to perform functional activities effectively postoperatively. Abdominal exercises may also help with correcting diastasis recti postpartum, should women experience it (Sharma, Lobo & Keller; 2014). Although there was consensus to correct diastasis recti postpartum to improve vigorous activity, the level of agreement was not high. However, it is important to assess, and if necessary to correct, as it often goes unnoticed by clinicians, and does cause abdominal pain (Parker, Millar & Dugan, 2008), which could impair functional activity. Correction of diastasis recti can be commenced postpartum, as recent findings in a retrospective study showed no difference in women who started exercises to correct diastasis recti during pregnancy and postpartum (Sharma et al., 2014).

There were also high levels of consensus and agreement on specific exercises to assist in improving the patients' functional abilities. While there was no research specific to hysterectomy and functional activities, the Canadian Guidelines for exercise in pregnancy advise that following an uncomplicated pregnancy, women should immediately begin mild forms of exercise, such as walking. However, women who have undergone a caesarean section should consult their health care provider prior to commencing exercises (Wolfe & Davies, 2003). Tailored postpartum exercises are also deemed necessary both to guide the process (Minig et al., 2009) and to make it patient-specific, which further highlights the need for physiotherapy involvement to improve postpartum functional activities.

There was consensus on other treatment modalities, such as scar tissue massage, for patients post-CSD, which could assist with improving functional ability if it was limited by pain (Shin & Bordeaux, 2012). Soft tissue mobilisation and teaching the "knack" maneuver also had a level of consensus, despite the agreement level being low. These techniques, like the others mentioned, may treat the problem responsible for the poor functional activity levels experienced by the patients. The researcher could not find any association with teaching the

"knack" maneuver and an increase in performing functional activities, unless the patient presents with urinary incontinence (Price et al., 2010).

8.3.3 The physiotherapy management of patients with urinary incontinence post caesarean section delivery and post hysterectomy

There was more mention of the use of literature and postgraduate courses by the participants in their reasons for selecting treatment techniques for patients with urinary incontinence (UI). Although there is a great deal of national and international research in postpartum urinary incontinence, the systematic review conducted in the present study (Chapter 7) revealed that there was no differentiation in the selected studies between the modes of delivery in the results. The mode of delivery is important to consider, as it could impact on the speed and extent of UI recovery in postpartum patients.

Nearly all the treatment techniques had consensus for managing patients post-CSD, with the exception of retraining core mobilisers and using a temporary supportive brace for overweight patients. In terms of hysterectomies, consensus was achieved for all the treatment techniques. The panel members were very specific in Round one to explain that postnatal and postoperative advice and education should comprise bowel and bladder activity and toileting habits. The importance of educating a patient is ingrained in many health care professions, but knowing what to teach them is equally important, as providing specific advice and education pertaining to their condition is essential to improve adherence (Roter et al., 1998). This research begins to address the issue by providing specific practical solutions as suggested by experts, to prevent or treat the complications found in this cohort of patients, which will hopefully assist in preventing or reducing postoperative complications.

A combination of assessment and treatment techniques was mentioned as management strategies for patients with UI. It is noteworthy that assessment techniques were only mentioned for patients with UI, despite assessment being needed for all the patients. This could be due to the importance and novelty of performing assessments comprising internal examinations for patients with UI among physiotherapists. This type of examination has only recently been receiving attention among South Africa physiotherapists and is only taught at postgraduate level. This was also highlighted by internal vaginal examination receiving a high level of consensus but a low level of agreement.

Treatment techniques selected would depend on the type of UI the patient presents with. Conservative management in the form of pelvic floor muscle training is first-line management for patients with stress urinary incontinence (NICE, 2013), which is generally the type of incontinence that affects women postpartum. However, should the patient not improve with the exercises after six weeks (allowing for the uterus to return to its normal size and the lochia to have ceased), an internal assessment and bladder diary should be done to determine the type of incontinence, and to provide them with a specific exercise programme. Despite the level of agreement not being as high as retaining the pelvic floor muscles, teaching the "knack" maneuver is considered equally important. A combination of the knack maneuver and strength training exercises was found to be effective in pelvic floor muscle training (Bø, 2004). Literature in this area has also found that these "two systems have a common base in the pelvic floor acting as a structural base, stabilizing the bladder and urethra during increases in abdominal pressure" (Bø, 2004). In post hysterectomy patients, a similar procedure can be followed, but this also depends on the surgeon and when he/she would suggest an internal examination to be feasible. In treating patients with UI, supervised pelvic floor exercises following a detailed assessment should form the initial conservative management strategy, as biofeedback and electrical stimulation are not considered routine treatments (NICE, 2013). Should the patient fail to recruit the pelvic floor muscles independently, then biofeedback and electrical stimulation should be considered.

Most of the panel members also selected retraining (activation) core stabilisers, which was followed by abdomino-pelvic muscle synergy retraining for patients post hysterectomy. The high levels of consensus and agreement suggest that the majority of panel members are using both treatment techniques equally to treat UI. Research into the use of core exercises and abdominal muscles to assist in pelvic floor rehabilitation has shown variable results (Bø et al., 2004). Although a more recent study has shown promising results on the submaximal contraction of transverse abdominis for bladder neck elevation, the study was performed on only a small group of continent women (Junginger et al., 2010). Until more research is done in this area, it is advisable not to use core exercises either isolated or concurrently with pelvic floor muscle training, or abdominal muscles, to treat women with UI, as incorrect recruitment and/or strong contractions can result in bladder neck descent (Junginger et al., 2010). This treatment technique will thus be excluded for now from the list of treatment strategies for this group of patients.

8.3.4 The physiotherapy management of patients with lower back pain post caesarean section delivery and post hysterectomy

Previous systematic reviews done on the effectiveness of physiotherapy on pregnancy-related LBP were found to be inconclusive (Ferreira & Alburquerque-Sendin, 2013; Stuge, Hilde & Vøllestad, 2003). While the relationship between gynaecological surgery and LBP remains unclear, women who undergo surgical menopause are at a moderate risk of developing back pain later on in life (Ericksen, Bean, Kiely, Hicks & Leveille, 2006).

There was a high level of consensus and agreement for the majority of the treatment techniques. The use of motor control, as suggested by the panelists in this study, seems the most rational among the selected techniques, because the theorised reasons for postpartum LBP are mainly due to a lack of spinal stability (Barton, 2004). A systematic review on the use of motor control exercises for persistent nonspecific LBP found it to be more effective than minimal interventions, despite the optimal implementation being unclear (Macedo, Maher, Latimer & McAuley, 2009). For patients post hysterectomy, it has been stated that abdominal and pelvic muscle rehabilitation may provide protection from LBP later in life in women after gynecological surgery (Ericksen et al., 2006), thus making the treatment an appropriate choice. Prospective research of high methodological quality is needed in this area (Ferreira & Alburquerque-Sendin, 2013; Stuge et al., 2003), however, while waiting for it, we have to consider the logical opinion of experts in the field

8.3.5 The physiotherapy management of patients with lower limb swelling post hysterectomy

Lower limb swelling was the final complication presented to the panel members for patients' post hysterectomy, for which early mobilisation and advice on positioning received the highest level of agreement. There was convergence around "very likely" for lymphatic drainage despite a low agreement level, which was interesting because lymphatic drainage is a recognised treatment for lymphedema (Rockson, 2001). Although there is no research specifically on women post hysterectomy, this treatment modality should be considered early for women presenting with lower limb oedema, as controlling the oedema from the onset may reduce its progression (Rockson, 2001).

8.3.6 Additional management strategies for patients post caesarean section delivery and post hysterectomy

There was a variety of postnatal advice and education suggested, namely: on pelvic floor muscles, ergonomics, kinetic handling, circulatory exercises, wound support, and breastfeeding. Physiotherapists are responsible for educating patients in all these aforementioned areas, but in terms of breastfeeding, they play a slightly smaller role. Physiotherapists mainly educate patients on the correct posture and positions during breastfeeding, and specific information such as latching is usually covered by a midwife or nursing sister. It was interesting to note the numerous times postnatal advice was mentioned by the experts, thereby demonstrating their awareness of its importance. At present, South Africa does not have a postnatal care guideline in place (Beksinska et al., 2006), therefore by implementing this guideline and forming a multidisciplinary team to care for postnatal patients, the quality of care rendered can be improved. The ripple effect will be a healthy baby (Torkan et al., 2009) and a reduction in the use of health resources because most postoperative morbidities will be prevented.

Consensus was achieved for all the additional strategies for patients post hysterectomy; early mobilisation had the highest level of agreement, followed by preoperative counselling. The use of early mobilisation following abdominal surgery is important, to prevent pulmonary complications (Haines, Skinner & Berney, 2013; Mackay, Ellis & Johnston, 2005) and deep vein thrombosis (Croissant & Shafi, 2009). None of the panel members mentioned any secretion clearance techniques, which are sometimes used prophylactically for this cohort of patients. However, research as shown that deep breathing techniques combined with early mobilisation did not reduce the incidence of pulmonary complications in patients who underwent abdominal surgery (Mackay et al., 2005). Contact with the physiotherapist prior to surgery to explain their role in the recovery process is a luxury, and based on anecdotal evidence, non-existent in South African public hospital settings. In a private practice setting, a preoperative consultation would also be uncommon unless the patient is already a client of the attending physiotherapist. However, preoperative counselling and establishing a relationship with the patient prior to surgery, is important, and the participants in this study agreed that it is a strategy that should be included. While this may not be possible in the near future, a first step would be to establish the role of the physiotherapist in the multidisciplinary team, and to educate the nursing staff and gynecologist on the role of the physiotherapist.

This must then form part of the preoperative counselling done by either the nurse or the gynecologist, although ideally it would be beneficial for the entire team to meet the patient prior to surgery.

8.4 CONCLUSION

Selecting a management technique is not a precise science, and patient presentation and clinical reasoning still play a major role in being an effective practitioner. The management strategies presented in this chapter are tools that have been shown to work by experts in the field, and should therefore be initially considered when managing this group of patients. Most of the management techniques selected were due to clinical experience, which further highlights the need for research in this area. Consensus and high levels of agreement were obtained for a number of management strategies, but the treatment rendered does depends on the time frame postoperative, which will be discussed in the subsequent chapter.

CHAPTER 9. COLLATION OF EVIDENCE FOR PHYSIOTHERAPY CLINICAL GUIDELINES DEVELOPMENT

9.1 INTRODUCTION

The results from the previous chapter showed that experts relied mainly on clinical experience when selecting the treatment techniques for patients post-CSD and hysterectomy, which confirmed the dearth of literature in this area. While numerous treatment techniques were selected per complication, this depended on how long postoperative physiotherapy was rendered. The research initially set out to provide evidence and establish the need to design different guidelines for HIV-infected and HIV non-infected women, the results from this study (Phase one) showed that a single set of clinical guidelines for the two groups will suffice, as both experienced the same complications, despite some affecting more HIV-infected women for longer periods. However, although the suggested postoperative management to both groups was identical, physiotherapists should be aware that HIV-infected women are more susceptible to complications and have a longer postoperative recovery time post caesarean section delivery or hysterectomy. The evidence for clinical practice guidelines for HIV-infected and non-infected women following both procedures, applying the evidence to guidelines and conclusion, is presented in this chapter.

9.2 EVIDENCE TO INFORM CLINICAL GUIDELINES DEVELOPMENT FOR HIV-INFECTED AND NON-INFECTED WOMEN FOLLOWING CAESAREAN SECTION DELIVERY AND HYSTERECTOMY

Postoperative care is usually divided into three phases, namely: the recovery phase, the ward phase, and the post-discharge phase (Doshani & Shafi, 2003). The recovery phase relates to the immediate post-surgical care of a patient until they can maintain their vital signs independently (Doshani & Shafi, 2003). In the ward phase (1–3 days for patients post caesarean section delivery or 1–4 days for patients post hysterectomy), patient care in the ward consists of the three important medical considerations: pain control, fluid balance, and nutrition (Doshani & Shafi, 2003). The post-discharge pertains to the follow-up care of the

patient for a minimum of six weeks postoperatively (Doshani & Shafi, 2003). Physiotherapists are seldom involved in the first phase of postoperative care, and usually involved in the last two, the management of which is presented, as well as the supporting evidence.

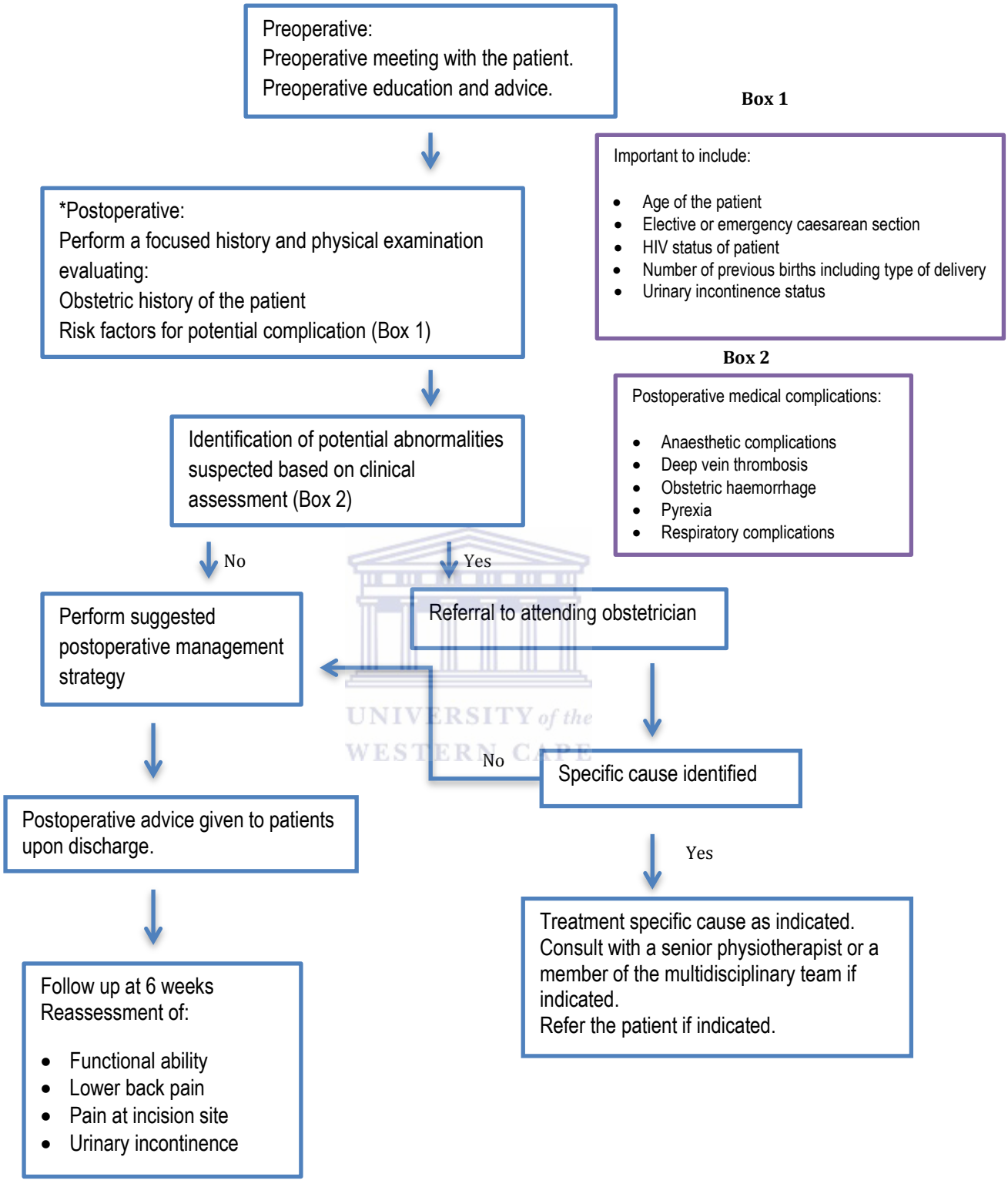
The evidence provided here to assist in the development of the clinical guideline can be used by all South African physiotherapists who are involved in treating HIV-infected and HIV non-infected women post caesarean section delivery (CSD) and post hysterectomy. The information is presented in the following sections: evidence for clinical practice guidelines for HIV-infected and non-infected women post caesarean section delivery, and evidence for clinical practice guidelines for HIV-infected and non-infected women post hysterectomy. The postoperative complications requiring treatment to improve the health related quality of life (HRQoL) and the quality of life (QoL) of women post-CSD and hysterectomy will be divided into two sections based on the phase of recovery: a) Ward phase, and b) Follow-up care, which will be presented below.

9.2.1 Evidence to inform clinical guideline development for HIV-infected and non-infected women post caesarean section delivery

Prenatal advice should be given by the physiotherapists concerning the importance of their role in postnatal care, education, and advice on urinary incontinence, ergonomics, kinetic handling and supported coughing. This should be done in conjunction with other members of the multidisciplinary team, with time allowed for any questions the patient may have. Patients who have a higher risk of developing postoperative complications and therefore require special attention in follow-up care, include the following women: HIV-infected; have undergone an emergency caesarean section; are ≥23 years old; have given birth to more than two children; and have experienced urinary incontinence after the procedure.

HIV-infected women are more susceptible to postoperative pain, experiencing difficulty with functional activities (bending and lifting objects) and urinary incontinence. Women who have undergone an emergency caesarean section are more susceptible to experiencing problems with functional activities and are more prone to urinary incontinence, while women ≥ 23years of age are more likely to experience postoperative pain. Women who experience urinary incontinence immediately after the procedure (1–3 days postoperatively) are more susceptible

to postoperative pain and urinary incontinence. Finally, women who have given birth to two or more children are more likely to experience urinary incontinence. Figure 9.1 represents the accompanying algorithm for patients undergoing a caesarean section delivery.



Start here in the event of an emergency CSD

Figure 9.1: Algorithm for patients who will be undergoing a caesarean section delivery

a. Ward Phase

Anecdotal information from several obstetricians has revealed that patients will experience postoperative pain, which is controlled with analgesics, and patients are encouraged to start mobilising for short distances within 24 hours of surgery. Patients should not experience respiratory problems in an uncomplicated procedure unless there is an underlying respiratory problem, in which case the physiotherapist must use respiratory techniques to treat the patient (Doshani & Shafi, 2003). The suggested treatment for ward care is detailed in Table 9.1

Table 9.1: Suggested treatment in the ward phase for patients post caesarean section delivery

Suggested treatment	Supporting evidence	Information
Mobilisation out of bed.	Expert opinion Doshani & Shafi, 2003 Mantle et al., 2004 Mackay et al., 2005	Based on clinical experience. Early mobilization will also assist recovering bowel function (Doshani & Shafi, 2003) and reduce the risk of circulatory and respiratory dysfunction (Mantle et al., 2004). Mobilization without breathing exercises is as effective as mobilization alone in patients after abdominal surgery (Mackay et al., 2005)
Transcutaneous Electrical Nerve Stimulation for pain at the incision	Karakaya et al., 2012 Johnson, 2002	A frequency of 120 Hz and pulse width of 60µs should be used. Electrodes placed on each side of the incision for 30min the current intensity should not cause contractions or feel uncomfortable (Karakaya et al., 2012; Johnson, 2002)
Pelvic floor exercises	Mantle et al., 2004	Slow, progressive controlled contractions as well as fast short sharp contractions (Mantle et al., 2004) should be taught as tolerated by the patient.
Advice and education: • On the pelvic floor muscles and their function and role in preventing urinary incontinence	Expert opinion Rovner & Wein, 2004	Based on clinical experience. Basic explanation of the pelvic anatomy and physiology aided by diagrams is an aspect of behavioural therapy (Rovner & Wein 2004) that should be taught to the patient to facilitate their understanding of their problem.
• Ergonomics and kinetic handling on how mobilize in and out of bed correctly, to carry the baby without placing additional strain on the back, positions on breastfeeding, how to lift and carry heavy objects.	Expert opinion American college of Obstetricians & Gynecologists, 1997	Based on clinical experience, literature and postgraduate courses. Advice concerning how and whether patients should resume activities must be a routine part of postoperative advice (American College of Obstetricians & Gynecologists, 1997).
• Circulatory exercises for the lower limb.	Expert opinion	Based on clinical experience To aid with lower limb circulation and to reduce postnatal lower limb swelling.
• Supporting of the wound during activities such as coughing, sneezing and laughing.	Expert opinion	Based on clinical experience. Provides external support to the surgical wound therefore reducing movement and postoperative pain during mentioned activities.
• Teaching of the 'knack' maneuver	Miller, Ashton-Miller & DeLancey, 1998 Bø, 2004	The "Knack" maneuver (Miller et al., 1998) or counter bracing aids to prevent accidental leakage during increases in abdominal pressure (Bø, 2004).

b. Follow-up care

Women who undergo an elective caesarean section need six weeks to return to normal non-pregnant conditions, while women who undergo an emergency caesarean section take longer than six weeks (Jansen et al., 2007). After six weeks, the wound has normally healed (Mantel et al., 2004). In terms of management for urinary incontinence, in order for the treatment to be effective, the therapist must first conduct a full assessment, comprising a detailed subjective (inclusive of a bladder diary) and objective judgment to determine if the patient has stress, urge, or mixed urinary incontinence (NICE, 2013). The use of biofeedback and electrical stimulation for treatment is not routine (NICE, 2013) and should only be considered if the patient fails to isolate the pelvic floor muscles independently. In terms of postpartum lower back pain (LBP) treatment, combination treatment is generally used in physiotherapy to treat chronic LBP (Chambers, 2013), making it difficult to determine the effectiveness of individual treatment techniques. The suggested treatment for follow-up care is detailed in Table 9.2.

Table 9.2:Suggested treatment in the recovery phase for patients post caesarean section delivery

Suggested treatment for:	Supporting evidence	Information
Postoperative pain at the incision site		
Exercise: abdominal muscle strengthening and general body conditioning	Expert opinion	Based on clinical experience.
Scar tissue massage	Expert opinion Shin & Bordeaux, 2011 Stasinopoulos & Johnson, 2004	Based on literature. It has physical and emotional benefits to patients and is hypothesized to reduce pain through the pain gate theory as described by Melzak and Wall in 1965. It has been hypothesized in literature that deep transverse frictions have a "local pain diminishing effect and results in better alignment of connective tissue fibrils." (Stasinopoulos & Johnson, 2004).
Desensitization of the scar	Expert opinion Schon et al., 2001	Based on clinical experience and literature. Desensitization of a surgical scar is considered if the patient has neuropathic type pain (Schon et al., 2001).
Transcutaneous Electrical Nerve Stimulation	Karakaya et al., 2012 Johnson, 2002	A frequency of 120 Hz and pulse width of 60µs should be used. Electrodes placed on each side of the incision for 30min the current intensity should not cause contractions or feel uncomfortable (Karakaya et al., 2012; Johnson, 2002)
Difficulty with functional activities		
Retaining (activation) of mobilizers	Expert opinion	Based on clinical experience.
Retraining (activation and strengthening) of pelvic floor muscles	Expert opinion	Based on clinical experience
Exercise: graded strengthening exercise program and general body conditioning	Expert opinion Wolfe & Davies, 2003 Minig et al., 2009	Based on clinical experience Following a caesarean section should consult their health care provider prior to commencing exercises (Wolfe & Davies, 2003) to tailor postpartum exercises (Minig et al., 2009)

Retraining of core mobilizers	Expert opinion	Based on clinical experience
Correction of diastasis recti	Expert opinion Parker, Millar & Dugan, 2008	Based on clinical experience. Often goes unnoticed and results in abdominal pain, which can lead to functional impairment.
Scar tissue massage	Expert opinion Shin & Bordeaux, 2011 Stasinopoulos & Johnson, 2004	Based on clinical experience. It is hypothesized to reduce pain which can result in functional impairment using the pain gate theory as described by Melzak and Wall in 1965. It has been hypothesized in literature that deep transverse frictions have a "local pain diminishing effect and results in better alignment of connective tissue fibrils." (Stasinopoulos & Johnson, 2004).
Urinary incontinence		
Detailed subjective and objective assessment	Expert opinion NICE, 2013 Mantle et al., 2004	Based on clinical experience and postgraduate courses. Vaginal examination should be conducted prior to the use of supervised pelvic floor muscle training (NICE, 2013; Mantle et al., 2004)
Retraining (activation and strengthening) or pelvic floor muscles.	Expert opinion NICE, 2013 Laycock & Jerwood 2001	Based on literature. The NICE guidelines (2013) suggests an exercise program consisting of at least eight contractions three times a day for a minimum of three months, as a first-line treatment for urinary incontinence. However Laycock & Jerwood (2001) suggest translating the findings from the PERFECT tool into a patient-specific exercise regimen.
Teaching the 'Knack' maneuver	Expert opinion Miller et al., 1998 Bø, 2004	Based on clinical experience and postgraduate courses. The "Knack" maneuver (Miller et al., 1998) or counter bracing aids to prevent accidental leakage during increases in abdominal pressure (Bø, 2004). A combination of the "Knack" maneuver and strength training exercises were found to be effective in PFM training (fBø, 2004)
Bladder retraining if indicated.	Expert opinion Rovner & Wein, 2004	Based on clinical experience and postgraduate courses. The use of a voiding log plays a central role in bladder training as it can be used as an educational tool to modify the fluid intake of a patient (Rovner & Wein, 2004).
Behavioural therapy	Expert opinion Rovner & Wein, 2004	Based on clinical experience and postgraduate courses. This consists of several aspects namely; patient education regarding the function of the lower urinary tract, fluid and dietary management, timed voiding, a voiding log or

		diary and it is used in combination with pelvic floor muscle exercises (for patients with stress urinary incontinece) (Rovner & Wein, 2004)
Biofeedback and neuromuscular stimulation of the pelvic floor muscles.	Expert opinion NICE, 2013	Based on clinical experience. The use of biofeedback and electrical stimulation for treatment is not routine (NICE 2013) and should only be considered to facilitate pelvic floor contractions should the patient struggle to isolate the muscles independently.
Lower back pain		
Motor control exercises.	Expert opinion Macedo et al., 2009	Based on clinical experience and literature. Motor control was found to be more effective for persistent nonspecific LBP than minimal intervention despite the optimal implementation being unclear (Macedo et al., 2009).
Abdomino-pelvic muscle synergy retraining	Expert opinion Sapsford, 2004 Richardson et al., 1999	Based on clinical experience, literature and postgraduate courses. In patients who have both LBP and pelvic floor dysfunction, LBP should be treated first (Sapsford, 2004). Although more research is needed in this area, the dual function for the pelvic floor muscles in providing trunk stability (Richardson et al., 1999) contributing to continence (Sapsford, 2004) provides an alternative in the treatment of LBP.
Soft tissue mobilization and myofascial release	Expert opinion Chambers, 2013	Based on clinical experience and CPD courses. Soft tissue massage has been shown to provide short term benefits for patients with LBP (Chambers, 2013).
Spinal mobilization	Expert opinion Chambers, (2013)	Based on clinical experience. There is insufficient evidence to evaluate the effectiveness of spinal mobilization (alone not in combination) as an effective treatment technique for chronic LBP (Chambers, 2013).
Trigger point therapy.	Expert opinion	Based on clinical experience.

9.2.2 Evidence to inform clinical guideline development for HIV-infected and non-infected women post hysterectomy

The physiotherapist should consult with the patient preoperatively at least once (Cook, 2004) to discuss the importance of his or her role in their management, as well as to prescribe pelvic floor exercises and educate them on the associated muscles. This should be done in conjunction with other members of the multidisciplinary team, with time allowed for any questions the patient may have. Patients who have a higher risk of developing long-term postoperative complications and therefore require special attention to follow up care include the following conditions: HIV-infected; underwent a subtotal hysterectomy, radical hysterectomy, total hysterectomy with bilateral salpingo-oophorectomy or radical hysterectomy with pelvic lymphadenectomy; had an abdominal incision; and ≤ 60 years old.

HIV-infected women are more susceptible to lower back pain, while women who undergo a subtotal hysterectomy, radical hysterectomy, total hysterectomy with bilateral salpingo-oophorectomy or radical hysterectomy with pelvic lymphadenectomy are more prone to postoperative pain. Women who have an abdominal incision are more susceptible to postoperative pain; difficulty with functional activities (bending and lifting objects) and lower limb swelling. Finally, women ≤ 60 years old are more susceptible to lower back pain. Figure 9.2 represents the accompanying algorithm for patients undergoing a caesarean section delivery.

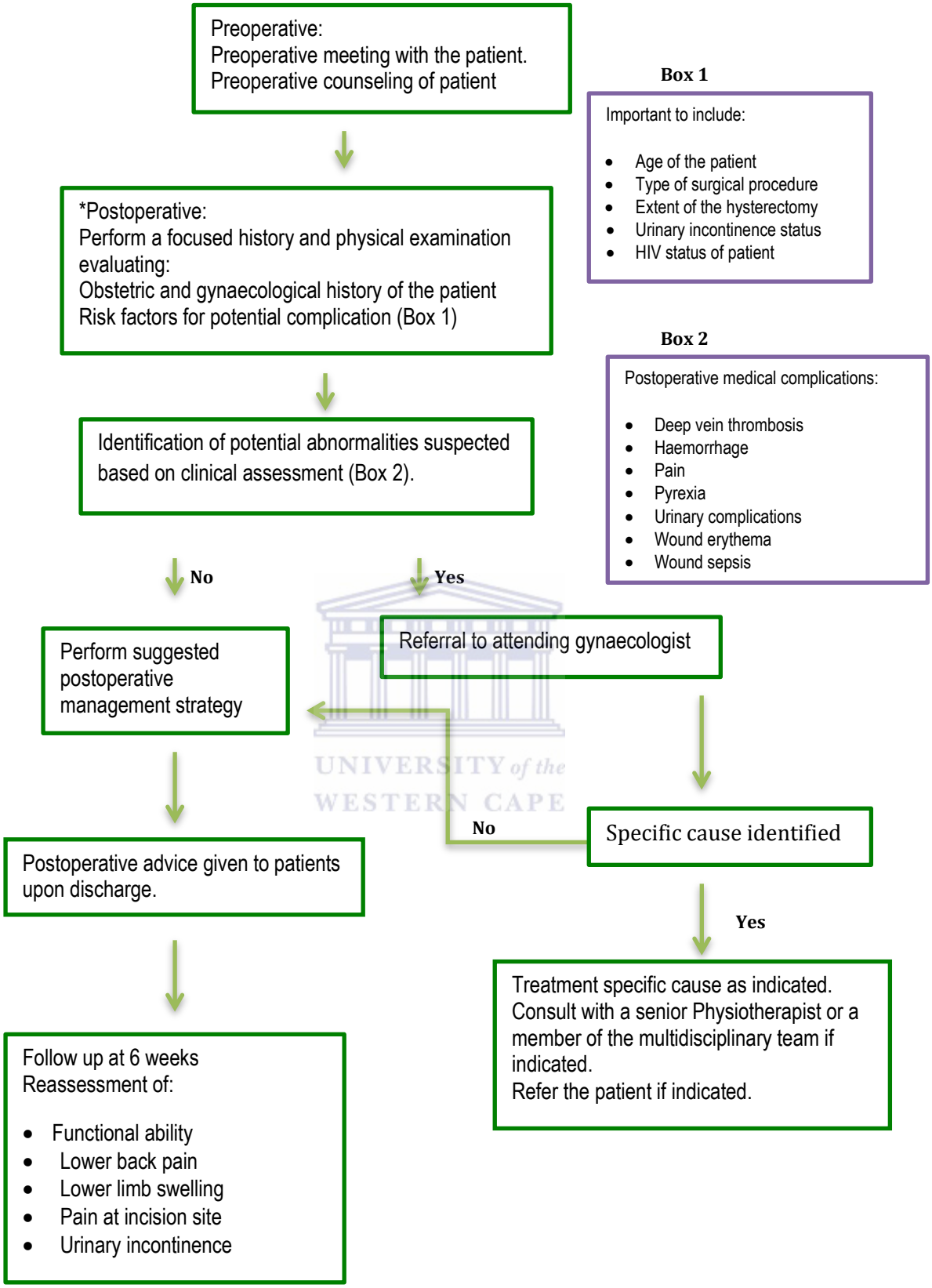


Figure 9.2: Algorithm for patients who will be undergoing a hysterectomy

a. Ward Phase

Respiratory complications following a hysterectomy are uncommon (Butt et al., 2012; Clark-Pearson & Geller, 2013) provided the patient does not smoke or have any preexisting respiratory conditions, such as chronic obstructive airway disease(s). Risk factors that can increase the likelihood of postoperative respiratory complications, such as reduced mobility and prolonged anaethesia, should also be taken into account (Berek & Hacker, 2000). Prophylactic chest physiotherapy and deep breathing exercises (Doshani & Shafi, 2003) should be considered as high-risk patients postoperatively, as these treatments have been found to be effective in preventing respiratory complications following major upper abdominal surgery (Manzano, Carvalho, Saraiva-Romanholo & Vieira, 2008; Fagevik Olsén, Hahn, Nordgren, Lönroth & Lundholm, 1997). The suggested treatment for ward care is detailed in Table 9.3.

Table 9.3: Suggested treatment in the ward phase for patients post hysterectomy

Suggested treatment	Supporting evidence	Information
Mobilisation out of bed	Expert opinion Croissant & Shafi, 2009 Doshani & Shafi, 2003 Mantle et al., 2004 Mackay et al., 2005	Based on clinical experience and literature. Early mobilization will assist with the prevention of deep vein thrombosis (Croissant & Shafi, 2009), facilitate bowel recovery (Doshani & Shafi, 2003) and prevent respiratory complications (Mantle et al., 2004). Mobilization without breathing exercises is as effective as mobilization alone in patients after abdominal surgery (Mackay et al., 2005)
Transcutaneous Electrical Nerve Stimulation for pain at the incision site	Bjersa & Andersson, 2014 Bjordal et al., 2003	A frequency ≥ 85Hz. Electrodes placed on each side of the incision with a current intensity being strong, sub-noxious with maximal tolerance as per patient for ≥ 30min (Bjersa & Andersson, 2014; Bjordal, et al., 2003).
Pelvic floor exercises	Cook, 2004	Slow, progressive controlled contractions as well as fast short sharp contractions should be taught as tolerated by the patient (Cook, 2004)
Advice and education: • On the pelvic floor muscles and their function and role in preventing urinary incontinence	Expert opinion Rovner & Wein, 2004	Based on clinical experience. Basic explanation of the pelvic anatomy and physiology aided by diagrams is an aspect of behavioural therapy (Rovner & Wein 2004) should be taught to the patient to facilitate the understanding of their problem.
• Ergonomics and kinetic handling on how mobilize in and out of bed correctly, how to lift and carry heavy objects	Expert opinion American college of obstetricians and gynecologists, 1997	Based on clinical experience. Advice concerning how and whether patients should resume activities must be a routine part of postoperative advice (American college of gynecologists, 1997).
• Supporting of the wound during activities such as coughing, sneezing and laughing.	Expert opinion	Based on clinical experience Provides external support to the surgical wound therefore reducing movement and postoperative pain during mentioned activities.
• Teaching of the 'knack' maneuver	Expert opinion Miller et al., 1998	Based on clinical experience. The "Knack" maneuver (Miller et al., 1998) or counter bracing aids to prevent accidental leakage during increases in abdominal pressure (Bø, 2004).

• Circulatory exercises for the lower limb.	Expert opinion	Based on clinical experience. To aid with lower limb circulation and to reduce lower limb swelling. Based on clinical experience.
• Early menopausal changes	Expert panel Shuster et al., 2010	Women who undergo a hysterectomy with a bilateral oophorectomy will experience early menopause (Shuster et al., 2010). Patients should be made aware of the effects of the estrogen deficiency and how to combat the symptoms once healed.

b. Follow-up care

An assessment that consists of a detailed subjective (inclusive of a bladder diary) and a vaginal assessment to determine if the patient has stress, urge or mixed urinary incontinence should be conducted before the prescription of pelvic floor muscle exercises (NICE, 2013). The anatomy and physiology of the pelvic floor should be explained to the patient at the first consultation, and pelvic floor home exercises should be prescribed (Yang et al., 2012). Patients should also be encouraged to do 60 minutes of moderate intensity exercises at least three times per week to reduce the effects of menopausal symptoms (Moriyama et al., 2008). If symptoms of depression or fatigue persist, the patient should be referred to their attending doctor for further investigations. The suggested treatment for follow-up care is detailed in Table 9.4

Table 9.4:Suggested treatment for follow-up care in patients post hysterectomy

Suggested treatment for:	Supporting evidence	Information
Postoperative pain at the incision site		
Exercise: abdominal muscle strengthening and general body conditioning	Expert opinion	Based on clinical experience.
Scar tissue massage	Expert opinion Stasinopoulos & Johnson, 2004	Based on clinical experience. It has been hypothesized in literature that deep transverse frictions have a "local pain diminishing effect and results in better alignment of connective tissue fibrils." (Stasinopoulos & Johnson, 2004).
Desensitization of the scar	Expert opinion Schon et al., 2001	Based on clinical experience. Desensitization of a surgical scar is considered if the patient has neuropathic type pain (Schon et al., 2001).
Trigger point therapy	Expert opinion Cummings, 2003; Defalque, 1982	Based on clinical experience. Small scar-entrapped neuromas (Defalque, 1982) in the postoperative surgical scar could benefit from trigger point therapy (Cummings, 2003)
Transcutaneous Electrical Nerve Stimulation	Bjersa & Andersson, 2014 Bjordal et al., 2003	A frequency ≥ 85Hz. Electrodes placed on each side of the incision with a current intensity being strong, sub-noxious with maximal tolerance as per patient for ≥ 30min (Bjersa & Andersson, 2014; Bjordal et al., 2003).
Difficulty with vigorous activities		
Retaining (activation) of core stabilizers	Expert opinion	Based on clinical experience.
Retraining (activation and strengthening) of pelvic floor muscles	Expert opinion	Based on clinical experience

Strengthening of gluteal muscles	Expert opinion	Based on clinical experience
Abdomino-pelvic muscle synergy retraining	Expert opinion	Based on clinical experience
Retraining of core mobilizers	Expert opinion	Based on clinical experience.
Difficulty with bending, kneeling and stooping		
Retaining (activation) of core stabilizers	Expert opinion	Based on clinical experience.
Exercise program: strengthening of gluteal muscles and general body conditioning	Expert opinion	Based on clinical experience.
Retraining (activation and strengthening) of pelvic floor muscles	Expert opinion	Based on clinical experience.
Retraining of core mobilizers	Expert opinion	Based on clinical experience.
Soft tissue mobilization	Expert opinion	Based on clinical experience.
Teaching the "knack" maneuver	Expert opinion	Based on clinical experience and postgraduate courses.
Urinary incontinence		
Assessment to determine the type of urinary incontinence	Expert opinion NICE, 2013 Mantle et al., 2004	Based on postgraduate courses. Vaginal examination should be conducted prior to the use of supervised pelvic floor muscle training (NICE, 2013)
Retraining (activation and strengthening) or pelvic floor muscles.	Expert opinion NICE, 2013 Laycock & Jerwood 2001	Based on clinical experience. The NICE guidelines (2013) suggests an exercise program consisting of at least eight contractions three times a day for a minimum of three months, as a first-line treatment for urinary incontinence. However Laycock & Jerwood (2001) suggest translating the findings from the PERFECT tool into a patient-specific exercise regimen.
Teaching the 'Knack' maneuver	Expert opinion Miller et al., 1998	Based on postgraduate courses. The "Knack" maneuver (Miller et al., 1998) or counter bracing aids to prevent accidental leakage

	Bø, 2004	during increases in abdominal pressure (Bø, 2004). A combination of the "Knack" maneuver and a strength training exercises were found to be effective in PFM training (Bø 2004)
Bladder retraining for urge incontinence	Expert opinion Rovner & Wein, 2004	Based on postgraduate courses. The use of a voiding log plays a central role in bladder training as it can be used as an educational tool to modify the fluid intake of a patient (Rovner & Wein, 2004).
Biofeedback and neuromuscular stimulation of the pelvic floor muscles	Expert opinion NICE, 2013	Based on postgraduate courses. The use of biofeedback and electrical stimulation for treatment is not routine (NICE 2013) and should only be considered to facilitate pelvic floor contractions should the patient struggle to isolate the muscles independently.
Soft tissue mobilization of tight structures .	Expert opinion	Based on clinical experience
Lower back pain		
Retraining (activation) of core stabilizers	Expert opinion Ericksen et al., 2006	Based on clinical experience. It was hypothesized that abdominal rehabilitation may provide protection from lower back pain later in life in women following gynecological surgery (Ericksen et al., 2006)
Retraining (activation and strengthening) of pelvic floor muscles	Expert opinion Ericksen et al., 2006	Based on clinical experience. It was hypothesized that pelvic muscle rehabilitation may provide protection from LBP later in life in women following gynecological surgery (Ericksen et al., 2006)
Abdomino-pelvic muscle synergy retraining	Expert opinion Sapsford, 2004 Richardson et al., 1999	Based on clinical experience. In patients who have both LBP and pelvic floor dysfunction, LBP should be treated first (Sapsford, 2004). Although more research is needed in this area, the dual function for the pelvic floor muscles in providing trunk stability (Richardson et al., 1999) and contributing to continence (Sapsford, 2004) provides an alternative in the treatment of LBP.
Motor control exercises.	Expert opinion Macedo et al., 2009	Based on clinical experience Motor control was found to be more effective for persistent nonspecific LBP than minimal intervention despite the optimal implementation being unclear (Macedo et al., 2009).
Exercise: lower limb strengthening		Based on clinical experience

and general body conditioning	Expert opinion	
Spinal mobilization	Expert opinion Chambers, 2013	Based on clinical experience. There is insufficient evidence to evaluate the effectiveness of spinal mobilization (alone not in combination) as an effective treatment technique for chronic LBP (Chambers, 2013).
Soft tissue mobilization and myofascial release	Expert opinion Chambers, 2013	Based on clinical experience. Soft tissue massage has been shown to provide short-term benefits for patients with LBP (Chambers, 2013).
Lower limb swelling		
Lymphatic drainage: complex decongestive therapy	Expert opinion Liao & Huang, 2012	Based on clinical experience and literature Complex decongestive physiotherapy is effective in the treatment of lower-limb lymphedema even in mild cases (Liao & Huang, 2012)
Prescribing anti-embolism stockings	Expert opinion	Based on clinical experience
Referral to the appropriate member of the multidisciplinary team	Expert opinion	Based on clinical experience

9.3 APPLYING THE EVIDENCE TO DEVELOP PHYSIOTHERAPY CLINICAL GUIDELINES

Owing to the paucity of research in this area, it was impossible to generate guidelines based on the current evidence available here. However, through the use of the conceptual framework used in this study, the information produced in this study is enough to facilitate the process. Table 9.5 shows how the information fits into the phases of the framework for clinical guideline development in physiotherapy (van de Wees et al., 2007) (discussed in Chapter 1) and which sections still need to be completed.

Table 9.5: Evidence provided based on the Framework for Clinical Guideline Development in Physiotherapy

What has been achieved	What still needs to be done
Phase 1. Organization and structure of guideline development	
This group has already been established by the South African Society of Physiotherapy	
Phase 2. Preparation	
The topic of interest was prioritized by the researcher and confirmed as a need by members within the South African Society of Physiotherapy. The potential to improve the care and therefore the overall HRQoL of women post CSD and hysterectomy has been highlighted. The need for guidelines relevant to this area has been identified (NICE, 2012, Department of Health, 2007)	
Phase 3. Guideline Development	
This followed several steps namely; 1. The subject area was refined and the two most common procedures women undergo were identified namely caesarean section and hysterectomy. This was used to generate the research questions. 2. A systematic review was conducted and all information relevant to the topic was identified using the PICOTT format. 3. Methods of assessing the methodological quality of the articles were performed using the PEDro scale. 4. The summarized evidence was presented in a narrative format. 5. There is a dearth of literature in this area. Thus the researcher had to conduct a Delphi survey to obtain expert opinion regarding managing this group of patients. 6. The evidence was evaluated and synthesized by the researcher. 7. The evidence was structured based on the clinical reasoning process used by physiotherapists.	The results will be presented to the SASP clinical guideline development committee (CGDC) as guidelines need to be generated by a working guideline group. The researcher will be made available for the entire process and make any relevant changes or adjustments based on their suggestions.
Phase 4. Validation	
The researcher has identified several obstetricians and gynaecologists to participate in the validation of the clinical guidelines, however their participation will be dependent on the criteria set by the SASP CGDC.	Guideline to be validated by obstetricians and gynaecologists. It will then be piloted among a small group of physiotherapists working in a district hospital. The final draft will be checked by the SASP CGDC.
Phase 5. Guideline Dissemination and Implementation	
An algorithm was drawn up for the management of patients' post-CSD and hysterectomy. This will be reviewed and adjusted if necessary by the SASP CGDC. The review of evidence in this area will be made available (Chapter 7)	The SASP and their Women's Health special interest will facilitate guideline dissemination, implementation and drawing up a patient version. Guideline implementation can be evaluated one year thereafter.
Phase 6. Guideline Evaluation and Revision.	
The guideline document will be updated every 5 years.	

In terms of meeting the criteria for clinical guideline development, Table 9.6 shows that this study contributed to 19 of the 23 criteria in AGREE tool, with the clinical guideline development committee (CGDC) only having to refine 8 of the areas.

Table 9.6: Contribution of the study against the AGREE tool criteria

Agree items: Domain and Criteria	**Thesis contribution**
Domain 1: Scope and Purpose	
The overall objective(s) of the guidelines is (are) described	Outlined in 1 and 2 to be refined by the CGDC.
The health question(s) covered by the guideline is (are) specifically described.	Identified in chapters 4, 5 and 6
The population (patients, public, etc.) to whom the guideline is meant to apply are specifically described.	Identified in chapter 1
Domain 2. Stakeholder Involvement	
The guideline development group includes individuals from all the relevant professional groups.	Outlined in chapter 9 to be completed by the CGDC
The views and preferences of the target population (patients, public, etc.) have been sought.	Identified in chapter 4 and 5
The target users of the guideline are clearly defined.	Outlined in Chapter 1
Domain 3. Rigor of Development	
Systematic methods were used to search for evidence	Completed in Chapter 7
The criteria for selecting the evidence are clearly described.	Outlined in Chapter 3
The strengths and limitations of the body of evidence are clearly described.	Completed in Chapter 7
The methods for formulating the recommendations are clearly described.	Outlined in Chapter 3 and Chapter 8
The health benefits, side effects, and risks have been considered in formulating the recommendations.	To be done by the CGDC
There is an explicit link between the recommendations and the supporting evidence.	Outlined in Chapter 9, to be refined and reviewed by the CGDC.
The guideline has been externally reviewed by experts prior to its publication.	To be completed by the CGDC
A procedure for updating the guideline is provided.	Outlined Chapter 9
Domain 4. Clarity of presentation	
The recommendations are specific and unambiguous.	Has been highlighted in Chapter 9. To be refined by the CGC
The different options for management of the condition or health issue are clearly presented.	Has been highlighted in Chapter 9. To be refined by the CGDC
Key recommendations are easily identifiable.	Highlighted in Chapter 9, to be refined by the CGDC
Domain 5. Applicability	
The guideline describes facilitators and barriers to its	Highlighted in Chapter 6, to be refined by

application.	the CGDC.
The guideline provides advice and/or tools on how the recommendations can be put into practice.	Has been highlighted in Chapter 9. To be refined by the CGC
The potential resource implications of applying the recommendations have been considered.	To be done by the CGDC
The guideline presents monitoring and/ or auditing criteria.	The SF 36 HRQoL questionnaire The Pelvic Floor Impact Questionnaire – short form 7 The European Organization for Research and Treatment of Cancer Quality-of-Life Questionnaire Cervical Cancer Module
Domain 6. Editorial Independence	
The views of the funding body have not influenced the content of the guideline.	No. Although funding was received from the SASP, this research was self-funded prior to the funding and did not affect the content.
Competing interests of guideline development group members have been recorded and addressed.	To be completed by the CGDC

9.4 CONCLUSION

This chapter has shown the collation of the evidence that can be used to develop clinical guidelines. The management strategies used were collated according to the various phases of postoperative management, and the clinical reasoning of physiotherapists. Barton (2004) states "a physiotherapist's strength is in 'core' skill and knowledge", thus answering the question, "Is there a place for physiotherapists in obstetric and gynecological wards?" with a simple Yes. Although there is a long research road ahead to scientifically prove the value of physiotherapists for postoperative management in women post-CSD and hysterectomy, this study provides a platform to build and base future research in this area. The next chapter draws the research to its conclusion and provides a summary of each phase of this research. The implication of the study, limitations and recommendations are also discussed.

CHAPTER 10. CONCLUSION

10.1 INTRODUCTION

"The part can never be well unless the whole is well." – Plato

The ongoing gender injustices have resulted in a shift of health care focus, with improving women's health becoming an urgent priority (WHO, 2009). Clinical guidelines are considered an effective method of improving the quality of care, their purpose being to guide health care professionals in all facets of service delivery, including Women's Health (SA Department of Health, 2007b; National Health and Medical Research Council, 1998). The impending change to the South African health care system with the launch of the National Health Insurance (Sekhejane, 2013) further signifies the need for guidelines to improve the quality of care (SA Department of Health, 2007b). There are currently no national guidelines available for the two most common procedures women undergo namely: caesarean section delivery (CSD) and hysterectomy (Bamigboye & Hofmeyr, 2005; Davies et al., 2002). South African guidelines relevant to women's health tend to promote management using the biomedical model, and do not consider the impact of the procedure on the postoperative quality of their life (SA Department of Health 2007a, 2001).

The biopsychosocial model is the way forward in medicine, because along with treating morbidities and preventing mortality (Engel, 1977), it is also used to determine the impact of a procedure on a patient, and therefore considers how the patient functions and feels postoperatively (Wood-Dauphinee & Korolija, 2006). This is an important step forward to improve the quality of health care, as it provides the patient with comprehensive and holistic care, which will decrease the demand for services resulting from postoperative complications. This will assist in reducing the current strain on the South African health care system. Research is needed to generate this type of clinical guideline in women's health, but there is a dearth of literature in this area, especially in the physiotherapy profession, which could be the reason for the present lack of clinical guidelines for patients post caesarean section delivery (CSD) and hysterectomy. The aim of this study was therefore to provide evidence to inform the development of physiotherapy clinical guidelines relevant for HIV-infected and HIV non-infected women following caesarean section delivery and hysterectomy. The aim of the

study was achieved with sufficient information generated to inform the development of physiotherapy clinical guidelines in this area. Furthermore, the study contributed to 19 of the 23 criteria in the AGREE document. In order to meet the aim of the study, a conceptual framework was used, which was divided into four phases. A summary highlighting the conceptual framework used in this study, the main findings of each of the study phases, the conclusion, the study limitations, implications of the study, and recommendations, will be presented below.

10.2 CONCEPTUAL FRAMEWORK

The study was divided into four main phases, each with specific objectives. The phases were based on an amalgamation of the Intervention Mapping Model (Bartholomew et al., 2001) and the Framework of Clinical Guideline Development in Physiotherapy within the European Region of World Confederation of Physiotherapy (van der Wees et al., 2007; van de Wees & Mead, 2004) (Table 1.3). Initially, on conception of the study, the researcher aimed to develop the clinical guidelines for HIV-infected and non-infected women following caesarean section delivery and hysterectomy. However, following the systematic review, the phases had to be adjusted to accommodate the deficiency of literature in this area. The framework used in this study, which was developed by the researcher, proved to be effective in generating information to assist in the development of clinical guidelines in an area where there is a dearth of literature. This model should therefore be considered by researchers to facilitate clinical guideline development for other health conditions where there is a paucity of research (Figure 10.1).

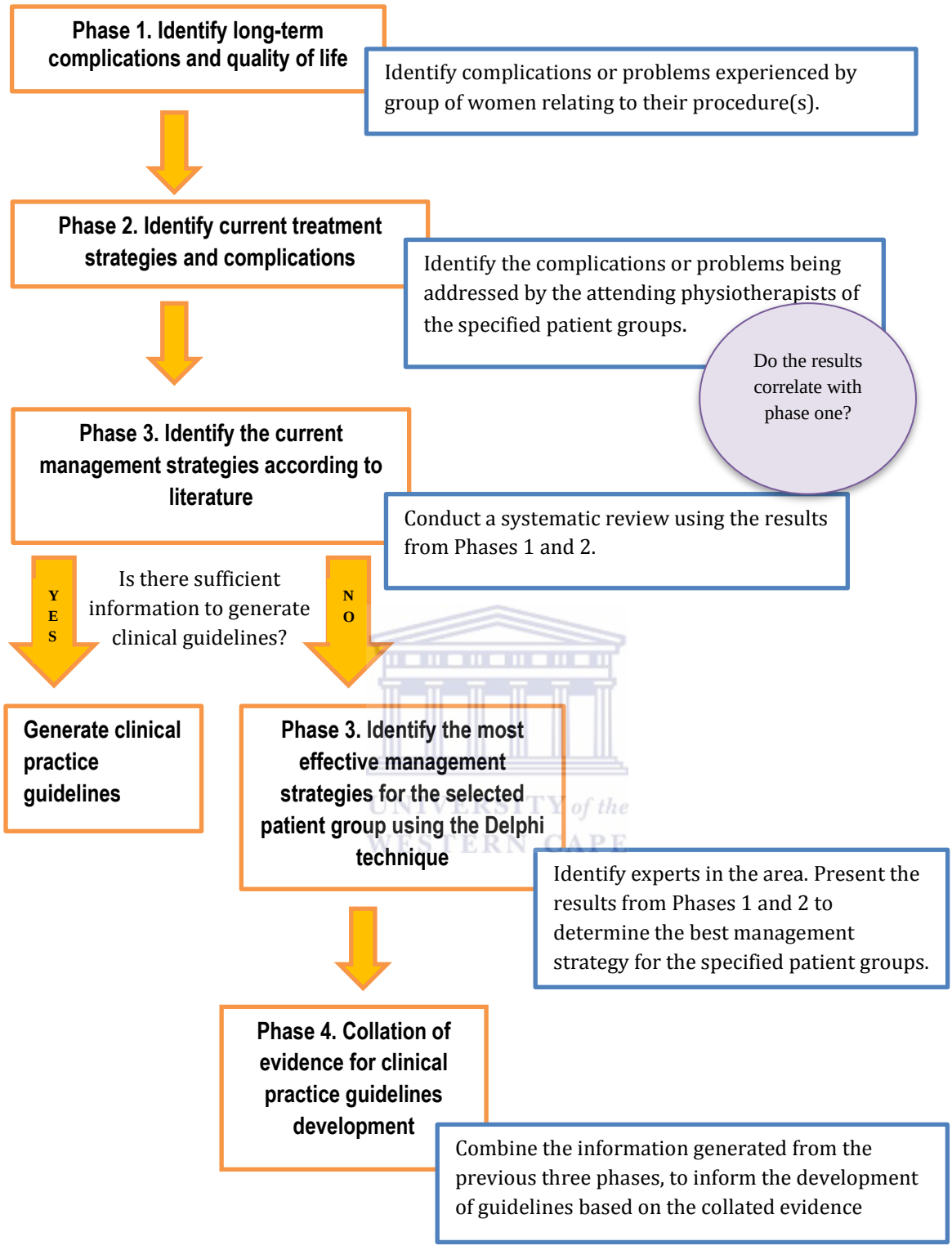


Figure 10.1: Conceptual framework used in the study

10.3 PHASE 1: IDENTIFY LONG-TERM COMPLICATIONS AND QUALITY OF LIFE

In order to develop guidelines relevant to a health problem or procedure, the problem first needs to be understood (van de Wees & Mead, 2004). However, in exploring the physiotherapy complications or general morbidity in patients post-CSD and hysterectomy, there is a paucity of national and international research. South Africa has the highest HIV prevalence rates globally, with KwaZulu-Natal being the epicentre of the virus (Statistics South Africa, 2013a). The impact of these two procedures on HIV-infected women thus also needs to be understood in order to provide comprehensive health care. Phase 1 of this study therefore consisted of two objectives, the first being to determine the long-term complications of HIV-infected and non-infected women post-CSD and hysterectomy, and the second being to determine the quality of life (QoL) among HIV-infected and non-infected women post-CSD and hysterectomy. This was done using various questionnaires through which the researcher explored the impact of the CSD or hysterectomy procedure on the postoperative QoL of HIV-infected and non-infected patients, and determined postoperative complications.

There is hardly any information in South Africa on the common problems experienced by women post-CSD and hysterectomy, with the focus being more on serious medical morbidities to reduce patient mortality (Moodley & Pattinson, 2012; Moodliar et al., 2007; Butt et al., 2012; Chrysostomou, 2008). The impact of these procedures on the QoL of women is thus lacking, and the attending physiotherapist may miss postoperative complications that can be rectified or prevented. The results from this phase of the study showed that the QoL of women was negatively affected post-CSD and hysterectomy. Postoperative pain at the incision site, physical functioning problems, lower back pain (LBP) and urinary incontinence (UI) were identified as long-term complications in these women post-CSD, while postoperative pain at the incision site, physical functioning problems, LBP, lower limb swelling, UI, depression and fatigue were identified as long-term complications in women post hysterectomy. The results also highlighted the importance of pre- and postoperative care, and showed that patients (CSD and hysterectomy) need to be educated about potential postoperative complications, using the role of the different members of a multidisciplinary team.

The findings from this phase of the study add to the body of knowledge in this area by establishing the QoL of HIV-infected and non-infected women post-CSD and hysterectomy, as well as highlighting common postoperative complications that need to be addressed in this cohort of women to improve the quality of their health care (SA Department of Health, 2007b). The majority of the complications identified can be managed and possibly prevented with conservative management rendered by physiotherapists. The postoperative problems identified in these areas were initially compared to and subsequently combined with the results from phase 2 of the study, to provide search terms for the systematic review.

10.4 PHASE 2: IDENTIFY THE CURRENT TREATMENT STRATEGIES AND COMPLICATIONS BEING ADDRESSED BY PHYSIOTHERAPISTS

South African physiotherapists have been involved in the area of women's health for over 30 years (Boissonnault, 2005), but there is a national paucity of physiotherapy research in this area. Phase 2 of the study therefore consisted of two objectives (Objectives 3 and 4) to gather the necessary information. The first objective of Phase 2 was to determine the physiotherapy treatment currently administered to patients post-CSD and hysterectomy, and the second was to determine the complications currently being addressed by physiotherapists in patients post-CSD and hysterectomy.

The results from this phase suggested that most participants were either unsure or would not vary their treatment according to the HIV-status of the patient. The main reason given was that HIV-infected women were prone to respiratory conditions post-CSD and hysterectomy. The most common complication identified in the results between Phases 1 and 2 was postoperative pain followed by lower back pain and urinary incontinence for patients post CSD and lower back pain and pelvic floor muscle weakness for patients post hysterectomy. The main problem addressed by the participants in this phase of the study was respiratory complications, which are generally uncommon among women, without predisposing medical problems (Doshani & Shafi, 2003). There was also minimal differentiation in the selection of treatment strategies among the participants when compared to their years of experience and whether they treated postoperative CSD or hysterectomy patients. These results suggested two very important issues that need to be addressed, namely:

- obstetricians and gynecologists maybe unaware of the role of physiotherapists in this group of patients, and are only referring patients with respiratory complications for physiotherapy; and
- postoperative complications which could negatively affect the patients' QoL are not being addressed either due to a lack of experience or knowledge in this area by the attending physiotherapist.

This emphasised the need for more research in this area to improve the undergraduate curriculum in Women's Health, and also to develop clinical guidelines to guide physiotherapists in this area of practice. It also showed the need to foster multidisciplinary relationships, and to educate obstetricians and gynecologists about the role of physiotherapists. Recently, research recommendations were made in America to improve interprofessional collaboration and expand the Women's Health care curricula across professions (U.S. Department of Health and Human Services, Health Resources and Services Administration, Office of Women's Health, 2013). This move will inevitably enhance "quality, patient care and evidence-based practice" through "greater knowledge and improved synergy" among the health care team members (U.S. Department of Health and Human Services, Health Resources and Services Administration, Office of Women's Health, 2013). Seeing that this was not specifically addressed to doctors and physiotherapists, the framework could be adjusted and applied in a South African setting to improve the quality of care in this field, with the results from this study also suggesting that change is required in order to provide comprehensive and holistic patient care. The postoperative complications highlighted in this phase were combined with the results from Phase 1, and were used to inform the search terms for Phase 3 of the study, which entailed identifying current physiotherapy management strategies.

10.5 PHASE 3: IDENTIFY CURRENT PHYSIOTHERAPY MANAGEMENT STRATEGIES

Phase 3 of the study consisted of Objectives 5 and 6. Objective 5 was to identify the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following a CSD or hysterectomy. This was achieved by performing a systematic review of national and international literature, with the search terms

based on the complications identified in Phases 1 and 2 and the research question. Based on the inclusion and exclusion criteria, the search yielded only two articles (one RCT and one pilot RCT) in the hysterectomy section. However, only one article was finally selected to be included to provide evidence for guideline development. This article forms part of the management strategy for women post hysterectomy. Initially, this information was supposed to be combined with Phases 1 and 2 to create a draft set of guidelines. Unfortunately, owing to the paucity of research on this area it was not possible to generate guidelines based on evidence. Evidence-based guidelines are one of four types of clinical guidelines (Owens, 1998; Eddy, 1990). In the absence of evidence in an area, expert opinion is utilised as it is also considered a type of guideline and forms a part of the hierarchy of evidence table (NICE, 2005). By using the expertise of physiotherapists working in Women's Health to develop clinical guidelines, it creates a starting point for the profession to improve the quality of postoperative care for patients post-CSD and hysterectomy. Clinical guidelines are reviewed every five years therefore as new research is generated in this area the document can be updated accordingly (Owens, 1998; Eddy, 1990). This led to Objective 6, which was to identify the most effective management strategies for treating women post-caesarean section and hysterectomy using the Delphi method.

The Delphi method was used to generate the information required in order to inform the development of guidelines that will be clinically significant to physiotherapists and benefit the patients by improving the postoperative management. Round 1 of the Delphi comprised open-ended questions where the postoperative complications from Phase 1 of the study were presented to a panel of experts in order to determine the treatment strategies to treat or prevent the postoperative complications. The information received was collated and presented to the same participants in Round 2 where using the Likert scale, they had to select which treatment technique they would most likely use. Owing of the shortage of research in this area, consensus was achieved by using level of agreement and central tendencies to determine convergence of opinion (Ludwig, 1994). The researcher collated the results, and consensus was reached on numerous techniques per complication. A literature search based on the results was performed to ensure that the correct evidence was presented to inform the development of the clinical guideline. Following the literature search, transcutaneous electrical stimulation (TENS) was added as a treatment (Bjordal et al., 2003; Rushton, 2002) for postoperative pain, but the use of core exercises (activation) and abdomino-pelvic muscle synergy retraining was excluded as a treatment for urinary incontinence (Junginger et al.,

2010, Bø et al, 2004). The addition of TENS was due to research noting a significant reduction in analgesic consumption when using the modality for postoperative patients, provided the correct stimulation and electrode placement were used (Bjordal et al., 2003). In addition, it has very few side effects, which makes it safe for postoperative use (Bjordal et al., 2003; Rushton, 2002). The exercises were excluded as a treatment for urinary incontinence on the basis that previous study results in this area were variable (Bø, 2004) and more recent research was performed only on women who were continent (Junginger et al, 2010). More research is thus needed in this area on women with incontinence before its use as treatment to determine its effectiveness because incorrect muscle activation or strong contractions can result in bladder neck decent (Junginger et al., 2010). The fact that changes were made to the treatment techniques provided by experts in the field, further highlighted the need for physiotherapy guidelines in this area. This led to the final phase of study, which was the collation of the evidence.

10.6 PHASE 4: COLLATE EVIDENCE FOR PHYSIOTHERAPY CLINICAL PRACTICE GUIDELINE DEVELOPMENT

Phase 4 adressed objectives 7 and 8 which were to collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected and HIV non-infected women post-CSD, and also collate the evidence that informs the development of physiotherapy guidelines for treating HIV-infected women and HIV non-infected women post hysterectomy, respectively. The results from Phases 1, 2 and 3 were therefore collated and two clinical evidence tables were drawn up, one for HIV-infected and non-infected women post-CSD and one for HIV-infected and non-infected women post hysterectomy. The reason for the lack of differentiation in the recommendations for the HIV-infected patients was because the results showed no difference in the type of complications experienced by HIV-infected and non-infected women. The HIV-infected group was merely more susceptible to the postoperative complications or needed a longer recovery time. The treatment or management strategies suggested for the postoperative complications were therefore identical irrespective of the patient's HIV-status. The structure followed to present the evidence was based on the Framework of Clinical Guideline Development in Physiotherapy (van de Wees et al., 2007; van de Wees & Mead, 2004), where the authors stated that structure is based on the clinical reasoning process of physiotherapists. Literature was also added to the tables to strengthen the recommendations made by the experts.

The information generated fulfils most of the phases in the Framework of Clinical Guideline Development in Physiotherapy (van de Wees et al., 2007) as well as the criteria in the AGREE tool. This information will be presented to the clinical guideline development committee in the South African Society of Physiotherapy for review. The researcher will avail herself for the final process of drafting the Clinical Guidelines, sending it for review and piloting it among a select group of public sector physiotherapists.

10.7 LIMITATIONS OF THE STUDY

The following limitations are noted with respect to the study:

1. The questionnaire(s) relied on the participants' ability to recall information, which they may not always have been able to do. .
2. Participants could have answered the questions based on what they considered to be socially or scientifically acceptable, rather than based on what they were experiencing.
3. Caution should be taken in generalising the results of the study to HIV-infected women and HIV non-infected women following a caesarean section or hysterectomy in KwaZulu-Natal.
4. Caution should be taken in generalising the results of the study to physiotherapists working with HIV-infected women and HIV non-infected women following a caesarean section or hysterectomy in KwaZulu-Natal, as the hospitals included in the study were all located in and around Durban.

10.8 IMPLICATIONS OF THE STUDY

The information generated in this study will assist in improving the lives of HIV-infected and HIV non-infected South African women post caesarean section delivery and hysterectomy, and is an important step forward in this field for the physiotherapy profession. Clinical reasoning cannot be excluded when managing a patient, but the information generated in this study equips physiotherapists with knowledge and will guide their treatment choices. The development of these guidelines will be the first both nationally and internationally in this field, with the information needing to be disseminated and implemented in order for change to occur. The South African health care system also advocates the development of clinical guidelines to improve the quality of care (SA Department of Health, 2007b). Furthermore, it

assists the physiotherapy profession by establishing a role of physiotherapists in women's health. Additional findings of the study that were not part of the objectives, but affect women's health care in South Africa, and also need to be addressed because health care is multifactorial are presented below:

- Creation of a women's health module. The need for the inclusion of an independent women's health module in the physiotherapy undergraduate curriculum was highlighted because most of the physiotherapists in this study relied on undergraduate knowledge to treat women following CSD and hysterectomy. This area of physiotherapy has the potential for growth and development, and exposing students to women's health from an undergraduate level will stimulate interest and promote research in this field. Furthermore, this will have positive long-term implications by improving the quality of care offered to patients, which can be subsequently montitored and evaluated.
- Active engagement with obsetricians and gynaecologists. Physiotherapists need to actively engage with obstetricians and gynecologists and establish their role within their team, as there were a low number of referrals, and generally only patients with respiratory complications were referred for physiotherapy. This could be done as part of a continuous professional development talk or an in hospital service lecture.
- Establishment of multidisciplinary teams in health care facilities. Presently there are no governmental policies in South Africa advocating the establishment of multidisciplinary teams (MDTs) for patient management. However, drawing up a national policy in this area or formally including it as part of the Quality in Health Care Policy (SA Department of Health, 2007b) would promote and facilitate this process, which is needed in most clinical practice areas. Futhermore, the formation of MDTs in the various areas of health would improve the quality of care rendered to patients, and promote the efficient use of resources by preventing many of the complications that generate a demand for services. In terms of this study the construction of a MDT for obstetric and gynaecology patients needs to be formed at a departmental level with a standardised and structured process of inter-professional handover and information transfer.
- Inclusion of gender empowerment programmes. The need for gender empowerment programmes with a focus on the use of contraception came across in this study; this

information will be relayed to the relevant stakeholders so that changes can be implemented to current programmes.

10.9 RECOMMENDATIONS

This study has highlighted gaps to be addressed in order to improve the quality of care offered to patients post-CSD and hysterectomy:

- The South African Society of Physiotherapy should encourage, promote and support research in the field of women's health.
- Universities need to develop postgraduate women's health courses that can be converted into a Master's degree.
- Postgraduate courses need to incorporate evidence-based practice with clinical training, which will encourage qualified physiotherapists to use evidence-based techniques and improve clinical behaviour.

The paucity of research in women's health especially nationally has led to various gaps being identified in the literature. These gaps need to be addressed in order to provide evidence-based research in this area. The evidence generated will be used to update and improve the quality of the physiotherapy clinical guidelines for HIV-infected and non-infected women post-CSD and post hysterectomy. Furthermore, this information will assist health care professionals in providing comprehensive patient care, hence working towards achieving South Africa's goals for improving the quality of health care (National Planning Commission, 2011; SA Department of Health, 2007b). The research questions identified to facilitate this process are presented below.

a. Short-term

- Is physiotherapy effective in improving the quality of life of women post caesarean section delivery?
- Is physiotherapy effective in improving the quality of life in women post hysterectomy?
- What is the effect of conservative physiotherapy management in patients with urinary incontinence post ceasarean section delivery? (The results can be divided into elective and emergency caesarean section delivery).

- What is the effect of conservative physiotherapy management in patients with urinary incontinence post hysterectomy? (The type of incontinence treated needs to be mentioned).
- What is the effect of physiotherapy management in women with lower back pain postpartum? (Systematic review and randomised controlled trial)
- What is the effect of physiotherapy management in women with lower back pain post hysterectomy?
- What is the effect of physiotherapy management in women with lower back pain post abdominal surgery? (Systematic review)
- What is effect of physiotherapy on postoperative pain in women post caesarean section delivery? (Single modality or combination)
- What is the effect of physiotherapy on postoperative pain in women post hysterectomy? (Single modality or combination)
- What is the effectiveness of scar tissue massage in the treatment of pain for postsurgical scars?
- What is the effect of pre-and postoperative advice on the quality of life in women post caesarean section delivery?
- What is the effect of pre- and postoperative advice on the quality of life in women post hysterectomy?

b. Long-term

- What is the prevalence of urinary incontinence among South African women undergoing an emergency caesarean section delivery? (The results need to be divided into the different types of incontinence).
- What is the prevalence of urinary incontinence among South African women undergoing a hysterectomy? (The results need to be divided into the different types of incontinence).
- What is the effect of core exercises (activation) in the treatment of women with stress urinary incontinence?
- What is the effect of core activation combined with pelvic floor exercises in women with stress urinary incontinence?

10.10 CONCLUSION

"Education is the most powerful weapon which you can use to change the world" – Nelson Mandela

To improve the quality of care offered to people in our health care system, they need to be managed comprehensively and holistically, which can only be achieved through knowledge in an area. The development of clinical guidelines is a lengthy and time-consuming process (Owens, 1998; Eddy, 1990). However, once achieved, clinical guidelines can assist practitioners in decision-making (Field & Lohr, 1990) and improve the quality of health care (SA Department of Health, 2007b). Women's Health, a previously neglected area, is currently in the spotlight, and research in this field is needed. This thesis has provided information which will remedy the dearth of literature in this area both nationally and internationally. The information generated can be used to develop physiotherapy clinical guidelines which will be the first produced with information based on research specific to South African women. It is only through knowledge in an area that one can hope to make a difference, and aid in making someone's life a bit easier, which in view of the bigger picture, is what this research is intended to achieve.

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Appendix A

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2542, Fax: 27 21-959 1217
E-mail: *jfrantz@uwc.ac.za*

For office use; code:_____ Today's Date:_____

Name: Last: _____ First: _____ Date of Birth: _____

Baseline □ 1 month □ 3 month □ 6 month □

Your Health and Well-Being

This questionnaire asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.
Thank you for completing this survey!

<u>Instructions:</u> For each of the following questions, please mark an ☒ in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. <u>Compared to one year ago</u>, how would you rate your health in general <u>now</u>?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(IQOLA SF-36v2 Standard, South Africa (English))

3. The following questions are about activities you might do during a typical day. Does <u>your health now limit you</u> in these activities? If so, how much?

		Yes, limited a lot	Yes, limited a little	No, not limited at all
a	<u>Vigorous activities</u>, such as running, lifting heavy objects, participating in strenuous sports	☐ 1	☐ 2	☐ 3
b	<u>Moderate activities</u>, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐ 1	☐ 2	☐ 3
c	Lifting or carrying groceries	☐ 1	☐ 2	☐ 3
d	Climbing <u>several</u> flights of stairs	☐ 1	☐ 2	☐ 3
e	Climbing <u>one</u> flight of stairs	☐ 1	☐ 2	☐ 3
f	Bending, kneeling, or stooping	☐ 1	☐ 2	☐ 3
g	Walking <u>more than a kilometre</u>	☐ 1	☐ 2	☐ 3
h	Walking <u>several hundred metres</u>	☐ 1	☐ 2	☐ 3
i	Walking <u>one hundred metres</u>	☐ 1	☐ 2	☐ 3
j	Bathing or dressing yourself	☐ 1	☐ 2	☐ 3

(IQOLA SF-36v2 Standard, South Africa (English))

4. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Cut down on the <u>amount of time</u> you spent on work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b <u>Accomplished less</u> than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Were limited in the <u>kind</u> of work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Had <u>difficulty</u> performing the work or other activities (for example, it took extra effort)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Cut down on the <u>amount of time</u> you spent on work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b <u>Accomplished less</u> than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Did work or other activities <u>less carefully than usual</u>	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(IQOLA SF-36v2 Standard, South Africa (English))

6. During the <u>past 4 weeks</u>, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?

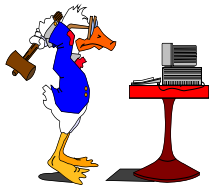
Not at all	Slightly	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

7. How much pain have you had during the <u>past 4 weeks</u> at your operation site?

None	Very mild	Mild	Moderate	Severe	Very severe
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

8. During the <u>past 4 weeks</u>, how much did <u>pain</u> interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5



(IQOLA SF-36v2 Standard, South Africa (English))

9. These questions are about how you feel and how things have been with you <u>during the past 4 weeks</u>. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the <u>past 4 weeks</u>…

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Did you feel full of life?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Have you been very nervous?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Have you felt so down in the dumps that nothing could cheer you up?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Have you felt calm and peaceful?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e Did you have a lot of energy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
f Have you felt downhearted and depressed?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
g Did you feel worn out?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
h Have you been happy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
i Did you feel tired?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

10. During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting with friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(IQOLA SF-36v2 Standard, South Africa (English))

11. How TRUE or FALSE is <u>each</u> of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a	I seem to get sick a little easier than other people	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b	I am as healthy as anybody I know	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c	I expect my health to get worse	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d	My health is excellent	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

12. Patients sometimes report that they have the following symptoms or problems. Please indicate the extent to which you have experienced these symptoms or problems.

	Not at all	A Little	Quite a bit	Very much
a	Have you had swelling in one or both your legs	☐ 1	☐ 2	☐ 3	☐ 4
b	Have you had pain in your lower back	☐ 1	☐ 2	☐ 3	☐ 4

(IQOLA SF-36v2 Standard, South Africa (English))

13. Please state any other issues you are experiencing after the operation?

_____

_____

_____

_____

14.a Did you seek medical attention from a health care professional (eg doctor, nurse or physiotherapist) for any of the postoperative problems experienced?

YES	NO

14.b If no, please state the reasons

_____

_____

_____

_____

15. Pelvic Floor Impact Questionnaire—short form 7

Instructions: Some women find that bladder, bowel, or vaginal symptoms affect their activities, relationships, and feelings. For each question place an X in the response that best describes how much your activities, relationships, or feelings have been affected by your bladder, bowel, or vaginal symptoms or conditions over the last **3 months**. Please make sure you mark an answer in **ALL** 3 columns for each question.

How do symptoms or conditions in the following usually affect your:	**Bladder or urine**	**Bowel or rectum**	**Vagina or pelvis**
1. Ability to do household chores (cooking, laundry housecleaning)?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit
2. Ability to do physical activities such as walking, swimming, or other exercise?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit

3. Entertainment activities such as going to a movie or concert?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit
4. Ability to travel by car/ taxi or bus for a distance greater than 30 minutes away from home?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit
5. Participating in social activities outside your home?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit
6. Emotional health (nervousness, depression, etc)?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit
7. Feeling frustrated?	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit	☐ Not at all ☐ Somewhat ☐ Moderately ☐ Quite a bit

Thank you for completing these questions!

Appendix B

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2542, Fax: 27 21-959 1217
E-mail: *jfrantz@uwc.ac.za*

For office use; code:_____ Today's Date:_____

Name:Last: _____ First: _____ Date of Birth: _____

Baseline □ 1 month □ 3 month □ 6 month □

Isimo sempilo yakho nobunjalo baso

Le mibuzo ibuza ngemibono mayelana nempilo yakho. Lolu lwazi luzosiza uhlale wazi ukuthi uzizwa unjani nokuthi uyenza kahle kangakanani imisebenzi yakho ojwayele ukuyenza. ***Siyabonga ngokugcwalisa kwakho le mibuzo!***

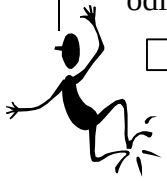
Kulowo nalowo mbuzo kwelandelayo, gcwalisa ngophawu ☒ ebhokisini okuyilona elichaza kahle impendulo yakho.

1. Ngokwejwayelekile, ungasho ukuthi isimo sempilo yakho:

Ngiphila saka	Sihle kakhulu	Sihle	Asisihle kakhulu	Sibi
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. <u>Uma uqhathanisa nangonyaka odlule</u> ungathi isimo sempilo yakho ngokwejwayelekile sinjani <u>manje</u>?

Singcono impela manje kunangonyaka odlule	Singconywangconywana kunangonyaka odlule	Sicishe sifane nangonyaka odlule	Sithe ukuba simbi kunangonyaka odlule	Simbi impela kunangonyaka odlule
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5



(SF-36v2™ Health Survey Standard, South Africa (isiZulu))

3. Le mibuzo elandelayo imayelana nezinto ongazenza njengenhlayenza osukwini. Kungabe <u>isimo sakho sempilo sesiyakuvimbela</u> yini ukuba wenze le misebenzi? uma kunjalo, uvimbeleka kangakanani?

	Yebo, kakhulu	Yebo, kancane	Cha, lutho
a	<u>Imisebenzi edinga amandla</u>, efana nokugijima, ukuphakamisa izinto ezisindayo, nokudlala imidlalo ekhandlayo	☐ 1	☐ 2	☐ 3
b	<u>Imisebenzi elukhunyana</u> njengokugudluza itafula, ukuphusha umshini wokuhlanza, ukushanela phansi noma ukudoba	☐ 1	☐ 2	☐ 3
c	Ukuqukula noma ukuphatha igilosa	☐ 1	☐ 2	☐ 3
d	Ukukhuphuka izitebhisi <u>eziningana</u>	☐ 1	☐ 2	☐ 3
e	Ukwenyuka izitebhisi <u>ukuya esitezi</u>	☐ 1	☐ 2	☐ 3
f	Ukugoba, ukuguqa, noma ukukhothama	☐ 1	☐ 2	☐ 3
g	Ukuhamba <u>ibanga elingaphezu kwekhilomitha</u>	☐ 1	☐ 2	☐ 3
h	Ukuhamba <u>ibanga elingamamitha angamakhulu amaningana</u>	☐ 1	☐ 2	☐ 3
i	Ukuhamba <u>ibanga elingamamitha ayikhulu</u>	☐ 1	☐ 2	☐ 3
j	Ukuzigeza noma ukuzigqokisa	☐ 1	☐ 2	☐ 3

4. <u>Emasontweni amane adlule</u>, isikhathi esingakanani lapho uke waba nenye yalezi zinkinga ezilandelayo ngomsebenzi wakho noma ngenye yezinto ojwayele ukuzenza nsukuzonke <u>ngenxa yokungaphatheki kahle komzimba</u>?

	Sonke isikhathi	Isikhathi esiningi	Kwesinye isikhathi	Isikhashana	Nhlobo
a Ukwehlisa <u>esikhathini</u> osichitha emsebenzini noma kwezinye izinto ozenzayo	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b <u>Ufeze ngaphansi</u> kokufisa kwakho	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Uvimbelekile ukwenza <u>uhlobo oluthile</u> lomsebenzi noma ezinye izinto	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Ukuthole <u>kunzima</u> ukwenza umsebenzi noma ezinye izinto (isibonelo, kuthathe amandla athe xaxa)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. <u>Emasontweni amane adlule</u>, isikhathi esingakanani lapho uke waba nenye yalezi zinkinga ezilandelayo ngomsebenzi wakho noma enye yezinto ozenza nsukuzonke <u>ngenxa yokungaphatheki kahle emoyeni</u>? (njengokuzizwa uphansi noma uvalo/ivuso)?

	Sonke isikhathi	Isikhathi esiningi	Kwesinye isikhathi	Isikhashana	Nhlobo
a Ukwehlisa <u>esikhathini</u> osichitha emsebenzini noma kwezinye izinto ozenzayo	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b <u>Ufeze ngaphansi</u> kokufisa kwakho	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Awuwenzanga umsebenzi noma eminye imisebenzi <u>ngokuqikelela</u> njengokwe jwayelekile?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

6. <u>Emasontweni amane adlule</u> ngabe izinkinga zempilo yakho ngokomzimba nangokomoya zibuphazamise kanjani ubudlelwane bakho nomndeni, abangani, omakhelwane, noma amaqembu?

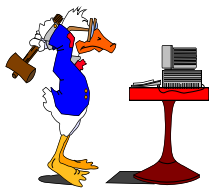
Azingiphazamisanga nhlobo	Zingiphazamise kancane nje	Ziphazamisile	Zithe ukuphazamisa impela	Ziphazamiseke kakhulu!
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

7. **Bungakanani ubuhlungu obenabo emavikini angu <u>amane adlule</u> endaweni ohlinzwe kuyo?**

Abukho	Buncane kakhulu	Buncane	Bukhona	Bekufiwa	Bekufiwa kakhulu
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

8. <u>Emasontweni amane adlule</u>, zikuphazamise kangakanani <u>izinhlungu</u> emsebenzini wakho ojwayelekile (owenza ekhaya nangaphandle)?

Azingiphazamisanga nhlobo	Zingiphazamise kancane nje	Ziphazamisile	Zithe ukuphazamisa impela	Uphazamiseke kakhulu!
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5



9. Le mibuzo imayelana nokuthi uzizwa unjani nokuthi izinto bezinjani <u>emasontweni amane adlule</u>. Embuzweni ngamunye, nikeza impendulo eshaya emhloleni ngobukuzwa. Isikhathi esingakanani <u>emasontweni amane adlule</u>…

	Sonke isikhathi	Isikhathi esiningi	Kwesinye isikhathi	Isikhashana	Nhlobo
a Uke wazizwa ungumqemane?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Uke washaywa uvalo kakhulu?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Uke wazizwa uphansi kangangoba akukho obekungaphakamisa umoya wakho?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Uke wazizwa unokuthula noxolo?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e Uke waba nomdlandla omningi?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
f Uke wazizwa udabukile futhi udangele?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
g Uke wazizwa ukhandlekile?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
h Ubujabule?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
i Uke wazizwa ukhathele?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

10. <u>Emasontweni amane adlule</u>, izinkinga zokukhathazeka kwakho <u>emzimbeni noma emoyeni</u> zikuphazamise kangakanani ekuphilisaneni kwakho nabanye abantu (njengokuvakasha nabangani, nezihlobo njll)?

Sonke isikhathi	Isikhathi esiningi	Kwesinye isikhathi	Isikhashana	Nhlobo
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(IQOLA SF-36v2 Standard, South Africa (English))

11. SIYIQINISO noma SIYIPHUTHA kangakanani isitatimende <u>ngasinye</u> kuwe kulezi ezilandelayo?

	Siyiqiniso ngokwempela	Siyiqiniso	Angazi	Siyiphutha	Siyiphutha ngokwempela
a Ngijwayele ukugula kalula kunabanye abantu	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Ngiphile saka njengabanye abantu engibaziyo	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Ngilindele ukuthi izinga lempilo yami lehle	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Impilo yami iyancomeka	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

12. Kwesinye isikhathi iziguli ziyaye zibike izinkinga ezithile noma ezinye zalezi zimpawu ezilandelayo. Uyacelwa ukuba uchaze ubungako balezo zinkinga noma izimpawu.

	Akwenzeki	Kancane	Kuvamile	Kakhulu
a Ngabe usuke wavuvukelwa unyawo noma izinyawo zakho.....	☐ 1	☐ 2	☐ 3	☐ 4
b Usuke waba nezinhlungu eqolo	☐ 1	☐ 2	☐ 3	☐ 4

13. Ingabe zikhona yini ezinye izinkinga onazo emva kokuba uhlinziwe?

_____

_____

_____

_____

14a. Ingabe uke walufuna usizo lwezempilo lokwelashwa (isibonelo: kodokotela, amanesi noma kuma-Physiotgerapists) mayelane nezinkinga obenazo emva kokuhlinzwa kwakho uma ubeletha?

YEBO	CHA

14b. Uma uthi cha, yisho isizathu

_____

_____

_____

_____

15. Uhlu lwemibuzo yePelvic Floor Impact — ifomu elincane 7

Imiyalelo: Abanye abantu besifazane bathola ukuthi izimpawu zesinye, amathumbu kanye nesitho sangasese zikhinyabeza ezocansi, ubudlelwano kanye nemizwa yabo. Kulowo nalowo mbuzo faka uphawu X kuleyo mpendulo eshaya emhlolweni mayelana nokuthi izinto ozenzayo, ubudlelwano kanye nemizwa yakho kukhinyabezeke kanjani kukhinyabezwa yisinye, amathumbu noma izimpawu zesitho sangasese esikhathini esingangezinyanga **ezi-3 ezedlule.** Qinisekisa ukuthi ufaka uphawu empendulweni kuwo womathathu amakhalamu.

Ngabe lezi zimpawu noma izimo ezilandelayo zikhinyabeza kanjani:	**Isinye noma umchamo**	**Amathumbu noma imbobo yangemuva**	**Isitho sangasese**
1. Ukukwazi ukwenza imisebenzi yasendlini (ukupheka, ukuwasha noku-ayina, ukuhlanza indlu)?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile

2. Ukukwazi ukwenza izinto ezishukumisa umzimba njengokuhamba, ukubhukuda noma okunye nje ukuzivocavoca?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile
3. Ezokuzithokozisa njengokuyobukela ibhayisikobho noma ikhonsathi?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile
4. Ukukwazi ukuhamba ngemoto, ngetekisi noma ngebhasi ibanga elingamakhilomitha angaphezu kwangama-30 ukusuka ekhaya?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile
5. Ukuzibandakanya ezintweni zomphakathi ezingaphandle kwekhaya lakho?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile
6. Umoya wakho (ukuba novalo, ingcindezi, njll.)?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile
7. Ukuzizwa ungaphathekile kahle?	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile	☐ Akwenzeki ☐ Kuyethukeka ☐ Kancane ☐ Kuvamile

Siyabonga ngokuphendula le mibuzo!

Appendix C

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

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E-mail: jfrantz@uwc.ac.za

Evidence to inform the development of Physiotherapy guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

Demographic Questionnaire and medical profile of patient

Instruction: To clarify with patient –taken from patients medical file

1. Name of patient _____ Code:_____

2. Age of patient (Age last birthday) …… (Years)

3. Race group of patient
   a. White
   b. African
   c. Coloured (mixed ancestry)
   d. Indian
   e. Asian

4. Marital status
   a. Never been married
   b. Married
   c. Separated
   d. Divorced
   e. Widowed
   f. Co-habiting/Living with someone as married

5 a. The number of children the patient has given birth to.
   a. 0
   b.1
   c.2
   d.3
   e.4
   f.5
   g. Other

5 b. If other, please specify the number in the space below:
   _____

6 a. The number of normal vaginal deliveries the patient had. *(specific to post-CSD)*
a. 0
b.1
c.2
d.3
e.4
f.5
g. Other

6 b. If other, please specify the number in the space below:
_____

7 a. The number of previous caesarean sections the patient had. *(specific to post-CSD)*
a. 0
b.1
c.2
d.3
e. other

7 b. If other, please specify the number in the space below:
_____

8. Is the patient currently experiencing any urinary incontinence problems following their procedure?

YES	NO

9 Has the patient experienced any previous problems with urinary incontinence?

YES	NO

9a. if yes please stipulate the length of time
_____

10. Is the patient currently experiencing any bowel incontinence problems following their procedure ?

YES	NO

11. Has the patient experienced any previous problems with bowel incontinence?

YES	NO

11 a. if yes please stipulate the length of time

_____

12. Did the patient experience continuous lower back pain for more than 6 months?

YES	NO

13. Type of operation performed *(specific to hysterectomy)*

_____

_____

14. How was the operation performed? *(specific to hysterectomy)*

_____

_____

Appendix D

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
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E-mail: jfrantz@uwc.ac.za

INFORMATION SHEET

Project Title: Evidence to inform the development of Physiotherapy guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

What is this study about?

This is a research project being conducted by Preshani Reddy at the University of the Western Cape. We are inviting you to participate in this research project because you have undergone a hysterectomy. The purpose of this research project is to provide evidence to develop physiotherapy guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery. This will assist in improving the physiotherapy treatment given to patients after a caesarean section or hysterectomy.

What will I be asked to do if I agree to participate?

1. You will be asked to provide verbal and written consent (which will be provided by the researcher) in order to agree to participate in the study. This consent will also grant the researcher permission to access your hospital records.
2. You will be requested to complete the same questionnaire 4 times. This will be done over 6 months. The questionnaire asks you for information relating to your health and wellbeing after your operation.
   Questionnaire 1 will be given to you 1-3 or 4 days after your operation.
   Questionnaire 2 will be given to you 1 month after the operation.
   Questionnaire 3 will be given to you 3 months after your operation.
   Questionnaire 4 will be given to you 6 months after the operation.
3. The questionnaire takes about 30 minutes to complete and comprises of 47 questions.
4. You do not have to write your name on the questionnaire when giving it to the researcher.
5. All information will remain ***confidential.***

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, the researcher will use codes to identify your information. Your name will not be included on any of the questionnaires so you ***DO NOT*** write your name on the questionnaire. A code will be placed on the questionnaires and other collected data. An identification key (code) will be used by the researcher to link your questionnaire to your identity. This is will be done only to compare the questionnaires in order to monitor your health for the study duration. Only the researcher will have access to the identification key. All results will be confidential. Once the completed questionnaires and consent forms are received, it will be locked away in a filing cabinet, which only the researcher will have access to. All data entered into the computer will be password protected by the researcher. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. In accordance with legal requirements and/or professional standards, we will disclose to the appropriate and/or authorities information that comes to

our attention concerning potential harm to you or others.

What are the risks of this research?
There are no known risks associated with participating in this research project.

What are the benefits of this research?
This research is not designed to help you personally, but the results may help the investigator learn more about the long-term complications which physiotherapy can address following a caesarean section and hysterectomy. We hope that, in the future, other people might benefit from this study through improved understanding of the problems HIV positive and HIV negative women who have a caesarean section or a hysterectomy have to deal with after the operation. It will also let us know how these problems affect their life both at home and work. This information can help physiotherapists prevent or reduce the problems after the operation and improve your quality of life.

Do I have to be in this research and may I stop participating at any time?
Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

Is any assistance available if I am negatively affected by participating in this study?
The researcher will refer you for counseling at your current hospital to the relevant health care providers should you be negatively affected by the study in anyway.

What if I have questions?

This research is being conducted by ***Preshani Reddy*** from the University of the Western Cape. If you have any questions about the research study itself, please contact Preshani Reddy on;

telephone: (031) 260-7817, cell: 0837997409, *e*-mail: reddypr@ukzn.ac.za or write to Physiotherapy Department, University of the Western Cape, Private Bag X17, Belville 7535

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:
Head of Department: Professor J. Phillips
Dean of the Faculty of Community and Health Sciences: Prof Mpofu
University of the Western Cape
Private Bag X17
Bellville 7535
This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee. Registration number 11/8/11

Appendix E

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2542, Fax: 27 21-959 1217

E-mail: jfrantz@uwc.ac.za

Incwadi yesaziso ngocwaningo

Isihloko Socwaningo: Ubufakazi obubonisa indlela yokwakhiwa kwemigomo yokwelapha ye-Physiotherapy kwabesifazane abanegciwane lesandulela ngculazi kanye nabangenalo emuva koqhaqho lwesibeletho.

Lungani lolu cwaningo?
Lolu wucwaningo oluqhutshwa uPreshani Reddy eNyuvesi yase Western Cape. Siyakumema ukuba uzibandakanye kulolu cwaningo ngoba usuke wahlinzwa ukhishwa isibeletho noma ubeletha. Inhlosongqangi yalolu cwaningo ukuthuthukisa indlela okwenziwa ngayo i*physiotherapy* kwabesifazane asebehaqwe yigciwane lesandulela ngculazi kanye nalabo abangenalo emva kokuhlinzwa uma bebeletha noma bekhishwa isibeletho. Lokhu kuzosiza ekuthuthukiseni ukwelashwa nge*physiotherapy* okunikezwa iziguli emva kokuhlinzelwa ukubeletha noma ukukhishwa isibeletho.

Yini engizocelwa ukuba ngiyenze uma ngivuma ukuzibandakanya kulolu cwaningo?

1. Uyocelwa ukuba unikezele ngemvume ngomlomo kanye nokuyibhala phansi (oyoyinikezwa ngumcwaningi) ekhombisa ukuvuma ukuba uzibandakanye kulolu cwaningo. Le mvume iyovumela umcwaningi ukuba abheke amarekhodi akho esibhedlela.
2. Uyocelwa ukuba ugcwalise uhlu lwemibuzo olulodwa kane (4). Lokhu kuyokwenziwa esikhathini esiyizinyanga eziyisithupha (6). Uhlu lwemibuzo luqukethe imibuzo emayelana nempilo yakho kanye nobunjalo bakho emva kokuhlinzwa.
   Uhlu lwemibuzo 1 uyonikezwa lona osukwini olu-1 kuya kwezi-3 emva kokuhlinzwa.
   Uhlu lwemibuzo 2 uyonikezwa lona emva kwenyanga e-1 uhlinziwe.
   Uhlu lwemibuzo 3 uyonikezwa lona emva kwezinyanga ezi-3 uhlinziwe.
   Uhlu lwemibuzo 4 uyonikezwa lona emva kwezinyanga eziyisi-6 uhlinziwe.
3. Uhlu lwemibuzo luthatha isikhathi esiyimizuzu engama-30 ukulugcwalisa kanti luqukethe imibuzo engama-47.
4. Akuswelekile ukuba ubhale igama lakho ohlwini lwemibuzo uma usunikeza umcwaningi.
5. Lonke ulwazi luyoba ***yimfihlo.***

Ngabe ukuzibandakanya kwami kulolu cwaningo kuyoba yimfihlo?
Siyokwenza konke okusemandleni ukugcina imininingwane yakho iyimfihlo. Ukwelekelela ukugcina imininingwane yakho iyimfihlo, umcwaningi uyosebenzisa amakhodi ukuveza imininingwane yakho. Igama lakho ngeke lifakwe kunoma yiluphi uhlu lwemibuzo ngakho-ke **UNGALIBHALI** igama lakho ohlwini lwemibuzo. Kuyofakwa ikhodi ohlwini lwemibuzo kanye nakolunye ulwazi oluqoqiwe. Kuyoba nendlela ethile eyosetshenziswa umcwaningi ukuxhumanisa uhlu lwemibuzo yakho kanye nemininingwane yakho. Lokhu kuyokwenzelwa kuphela ukuqhathanisa uhlu lwemibuzo ukuze kuqashelwe impilo yakho ngesikhathi

kusenziwa lolu cwaningo. Umcwaningi kuphela oyoba nolwazi ngale ndlela yokuxhumanisa imininingwane yakho. Yonke imiphumela iyoba yimfihlo. Uma sekutholakele uhlu lwemibuzo olugcwalisiwe kanye nezincwadi zemvume, kuyobe sekuvalelwa ekhabetheni elikhiywayo okuyoba umcwaningi kuphela oyolivula. Lonke ulwazi oluyogcinwa kwikhompyutha luyotholakala ngokufaka ikhodi eyimfihlo eyobe yaziwa ngumcwaningi. Uma kubhalwa umbiko noma kubhalwa iphepha locwaningo ngalolu cwaningo, imininingwano yakho iyoba yimfihlo ngokuseqophelweni eliphezulu. Ngokuhambisana nemigomo nemibandela noma yomsebenzi siyokwazisa abantu abathile noma abaphathi ngolwazi esilutholayo uma kukhona okungaba yingozi kuwena noma kwabanye.

Yibuphi ubungozi kulolu cwaningo?
Abukho ubungozi obaziwayo ekuzibandakanyeni kulolu cwaningo.

Yimiphi imihlomulo ekhona kulolu cwaningo?
Lolu cwaningo alwenzelwe ukusiza wena siqu sakho kepha imiphumela iyokwelekelela umcwaningi ukuba afunde kabanzi ngezinkinga ezingaba khona esikhathini eside emva kokuhlinzelwa ukubeletha kanye nokukhipha isibeletho. Sethemba ukuthi esikhathini esizayo bakhona abantu abayosizakala ngalolu cwaningo ngokuqonda ngokugcwele izinkinga abesifazane abahaqwe yigciwane lesandulela ngculazi kanye nalabo abangenalo leli gciwane okumele babhekane nazo emva kokuhlinzelwa ukubeletha noma bekhishwa isibeletho. Lokhu kuzosenza sibe nolwazi lokuthi lezo zinkinga ziyikhinyabeza kanjani impilo yabo yasekhaya kanye neyasemsebenzini. Lolu lwazi luyosiza nodokotela bamathambo ukuba bakwazi ukuvikela noma behlise izinga lezinkinga emva kokuhlinzwa kanye nokukhuphula izinga lempilo.

Ngabe ngiphoqelekile ukubamba iqhaza kulolu cwaningo noma ngingayeka noma nini?
Ukubamba kwakho iqhaza kulolu cwaningo akuphoqelelwe. Ungazikhethela ukungabi yingxenye yalolu cwaningo. Uma ukhetha ukuzibandakanya kulolu cwaningo unelungelo lokuyeka nganoma yisiphi isikhathi. Uma ukhetha ukungazibandakanyi kulolu cwaningo noma uyeka phakathi nalo ngeke uhlawuliswe ngalokho futhi ngeke ulahlekelwe yilutho.

Ngabe lukhona yini usizo engiyolithola uma kuba khona okungiphatha kabi kulolu cwaningo?
Uma kuba khona okukuphatha kabi kulolu cwaningo umcwaningi uyokwedlulisela kubeluleki bezengqondo esibhedlela sakho.

Uma ngiba nemibuzo?

Lolu cwaningo lwenziwa u***Preshani Reddy*** eNyuvesi yase Western Cape. Uma uba nemibuzo mayelana nocwaningo ungaxhumana no Preshani Reddy ku;

Ucingo: (031) 260-7817, icell: 0837997409, i-*e*-mail: reddypr@ukzn.ac.za noma ubhalele kuleli kheli: Physiotherapy Department, University of the Western Cape, Private Bag X17, Belville 7535

Uma uba nemibuzo ngalolu cwaningo noma ngamalungelo akho ngengombambiqhaza kulolu cwaningo noma ufisa ukubika izingqinamba ohlangabezane nazo kulolu cwaningo, uyacelwa ukuba uxhumane no:

Head of Department: Professor J. Phillips
Dean of the Faculty of Community and Health Sciences: Prof Mpofu
University of the Western Cape
Private Bag X17
Bellville 7535

Lolu cwaningo lugunyazwe yi University of the Western Cape's Senate Research Committee and Ethics Committee. Inombolo yokubhalisa: 11/8/11

Appendix F

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2542, Fax: 27 21-959 1217

E-mail: jfrantz@uwc.ac.za

CONSENT FORM

Title of research project: Evidence to inform the development of Physiotherapy Guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name……..

Participant's signature……

Witness……

Date……

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Professor J. Frantz
University of the Western Cape
Private Bag X17, Belville 7535
Telephone: (021)959- 3661
Cell: 0828522527
Fax: (021)959-1217
Email: jfrantz@uwc.ac.za

Appendix G

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E-mail: jfrantz@uwc.ac.za

INCWADI YEMVUME

Isihloko Socwaningo: Ubufakazi obubonisa indlela yokwakhiwa kwemigomo yokwelapha ye-Physiotherapy kwabesifazane abanegciwane lesandulela ngculazi kanye nabangenalo emuva koqhaqho lwesibeletho.

Ngichazeliwe ngalolu cwaningo ngolimi engiluqondayo, ngakho-ke ngizivumela mina ngingaphoqwe muntu ukubamba iqhaza kulolu cwaningo. Imibuzo ebenginayo ngalolu cwaningo iphenduliwe. Ngiyakuqonda ukuthi igama lami liyohlala liyimfihlo kulolu cwaningo futhi uma ngifisa ukuyeka ukuba yingxenye yalolu cwaningo ngingayeka noma nini ngaphandle kokunikeza isizathu. Ukuyeka kwami ukuba yingxenye yalolu cwaningo ngeke kube namiphumela emibi kimi.

Igama lombambiqhaza:……
Isiginesha:……..
Ufakazi:……..
Usuku:……

Uma kwenzeka uba nemibuzo mayelana nalolu cwaningo noma ufisa ukubika izinkinga ohlangabezane nazo kulolu cwaningo, uyacelwa uxhumane nomxhumanisi walolu cwaningo:

Igama Lomxhumanisi Wocwaningo: Professor J. Frantz
University of the Western Cape
Private Bag X17, Belville 7535
Telephone: (021) 959- 3661
Cell: 0828522527
Fax: (021) 959-1217
Email: jfrantz@uwc.ac.za

This is to certify that the IQOLA Project has have prepared a true adaptation from English (United States) into English (for South Africa) of the SF-36v2TM Health Survey. This adaptation was developed by a review of all items and response choices in the source (United States English) form by English-speaking researchers in South Africa and a review of their suggested changes by U.S. researchers. Based on these reviews, minor modifications were made to the source (United States) English-language instrument for use in South Africa. In addition, a lay panel review was conducted with five English-speaking respondents in South Africa, to make sure the South African form was clear and being understood correctly.

Sincerely,

Barbara Gandek, M.S.
Director, IQOLA Project

This is to certify that IQOLA Project researchers have prepared a true translation from English (for United States) into isiZulu (for South Africa) of the SF-36v2TM Health Survey. This translation was developed using the standard IQOLA translation methodology, which involves multiple independent forward translations by native speakers; reconciliation of the translations into one form; backward translation of this translation into English to check for conceptual equivalence; and qualitative debriefing tests with a small number of native isiZulu speakers in South Africa. Further details of the IQOLA translation process can be found in the following peer-reviewed article: Bullinger M, Alonso J, Apolone G, Leplège A, Sullivan M, Wood-Dauphinee S, et al. Translating health status questionnaires and evaluating their quality: The International Quality of Life Assessment Project approach. J Clin Epidemiol 1998; 51:913-923.

Sincerely,

Barbara Gandek

Barbara Gandek, M.S.
Director, IQOLA Project

To whom it may concern:

This letter serves to confirm that I, Dr Gugulethu Brightness Mazibuko, a lecturer in the School of isiZulu Studies(UKZN) have translated the consent letter, research questionnaire and information sheet for Preshani Reddy. I am a registered translator for English and isiZulu. I am registered with the South African Translators Institute (SATI). My registration number is: 1001896.

Yours sincerely
Dr GB Mazibuko

GBmazibuko ..... 10/11/2011 .....

Appendix K

To whom it may concern.

May this note serve to confirm that I, Romualda Sebenzile Ngubane, a lecturer in English Studies (UKZN) translated a patient questionnaire from isiZulu back into English for Ms Preshani Reddy's research project.

I thank you

RS Ngubane 28/11/2011

RS NGUBANE

Appendix L

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2542, Fax: 27 21-959 1217

E-mail: jfrantz@uwc.ac.za

Evidence to inform the development of Physiotherapy clinical guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery

QUESTIONNAIRE FOR PHYSIOTHERAPISTS

Part 1: Socio-demographic section and management of patients post caesarean section delivery

Section A: Socio-demographic Information

Instruction: Please circle the answer or indicate your choice with an X where necessary

1.1. How old are you? (Age last birthday) …… (Years)

1.2. What is your gender?

a. Female

b. Male

1.3. To which race group do you belong?

a. White

b. African

c. Coloured (mixed ancestry)

d. Indian

e. Asian

1.4. In which year did you complete your undergraduate degree?

_____

1.5. Do you hold a post-graduate degree in physiotherapy eg: Masters or PhD?

YES	NO

1.5a. *If yes, please specify postgraduate qualification(s) below:*

_____

_____

Section B: Number of patients treated post-CSD

2.1. Have you treated a postoperative caesarean section patient in the past year?

YES	UNSURE	NO

2.1a. *If yes, please specify on average the number of patients who have undergone this particular procedure you have treated in the past year.*

_____

2.1b. *If no, please select the reason from the options below.*

1	High workload	
2	Lack of referral from the attending doctor	
3	I have not been on that rotation	
4	Other	

2.1c. *If other please specify:*

_____

_____

Section C: Management of post-operative patients post caesarean section delivery.

3.1. Please indicate the treatment(s) you select to manage patients following a caesarean section (you may select more than one).

1	Percussion	
2	Vibration	
3	Deep Breathing Exercises	
4	Inspiratory Hold	
5	Active Cycle Breathing Technique	
6	Mobilization	
7	Pelvic Floor Exercises	
8	Education	
9	Other	

3.1a.*If other please specify:*

_____
_____
_____

3.2. On average how many physiotherapy sessions would you render for a patient following a caesarean section?

_____

3.3. How long would you spend (per session) treating a patient following a caesarean section?

>15 minutes	15 – 30 minutes	30 – 45 minutes	> 45 minutes

3.4. Are there specific Physiotherapy related complication(s) that you address in postoperative caesarean section patients?

YES	UNSURE	NO

3.4a. *If yes, please elaborate.*

_____
_____
_____

3.5. Would your management strategy vary depending on the HIV status of the patient?

YES	UNSURE	NO

3.5a. *If yes, please elaborate.*

_____
_____
_____

Section D: Referral to members of the multidisciplinary team and discharge advice

4.1. Have you ordered any surgical appliance(s) and/or orthotic(s) for this type of patient eg. an assistive device, brace or pressure garment?

YES	UNSURE	NO

4.1a. *If yes, please specify the appliance ordered and the reason.*

_____
_____

4.2. Have you referred a patient following a caesarean section to other member(s) in the multidisciplinary team?

YES	UNSURE	NO

4.2a. If yes, please mention which member(s) in the multidisciplinary team the patient was referred to and the reason for referral.

_____
_____
_____

4.3. Do you give your patient advice upon discharge?

YES	UNSURE	NO

4.3a. *If yes, please provide a brief summary of the advice given to the patient.*

_____
_____
_____
_____

Part 2: Management of patients post hysterectomy

Section A: Number of patients treated post-hysterectomy

5.1. Have you treated a postoperative hysterectomy patient in the past year?

YES	UNSURE	NO

5.1a. *If yes, please specify on average the number of patients who have undergone this particular procedure have you treated in the past year*.

Procedure	**Number**
Sub-total Hysterectomy (Complete removal of the uterus only, the cervix is left in place)	
Total Hysterectomy (Complete removal of the uterus and cervix)	
Radical Hysterectomy (complete removal of the uterus, cervix, upper vagina, and parametrium)	
Radical Hysterectomy with pelvic lymphadenectomy	
Other	

5.1b.If other please specify:

_____
_____
_____

5.1c. *If no, please select the reason from the options below.*

1	High workload	
2	Lack of referral from the attending doctor	
3	I have not been on that rotation	
4	Other	

5.1d. If other please specify:

_____

Section B: Physiotherapy management post hysterectomy

6.1. Please indicate the treatment(s) you select to manage patients following a hysterectomy (you may select more than one treatment modality).

1	Percussion	
2	Vibration	
3	Deep Breathing Exercises	
4	Inspiratory Hold	
5	Active Cycle Breathing Technique	
6	Mobilization	
7	Pelvic Floor Exercises	
8	Education	
9	Other	

6.1a. If other please specify:

_____

_____

6.2. Would your management strategy for this patient vary depending on the HIV status of the patient?

YES	UNSURE	NO

6.2a. *If yes, please elaborate.*

_____

_____

_____

6.3. Would your management for this type of patient vary depending on the type of hysterectomy performed eg: subtotal hysterectomy vs total hysterectomy?

YES	UNSURE	NO

6.3a. *If yes please elaborate:*

_____
_____
_____

6.4. Would your management for this type of patient vary depending on the incision site or operative procedure eg: vaginal hysterectomy vs abdominal hysterectomy vs laparoscopic abdominal hysterectomy?

YES	UNSURE	NO

6.4a. *If yes please elaborate:*

_____
_____
_____

6.5. On average how many physiotherapy sessions would you render for a patient following a hysterectomy?

_____

6.6. How long would you spend (per session) treating a patient following a hysterectomy?

>15 minutes	15 – 30 minutes	30 – 45 minutes	> 45 minutes

6.7. Are there specific Physiotherapy related complication(s) that you address in postoperative hysterectomy patients?

YES	UNSURE	NO

6.7a. *If yes please elaborate.*

_____

_____

_____

Section C: Referral to members of the multidisciplinary team and discharge advice

7.1. Have you ordered any surgical appliance(s) and/or orthotics for this type of patient eg. an assistive device, brace or pressure garment?

YES	UNSURE	NO

7.1a. *If yes please specify the appliance ordered and the reason below.*

_____

_____

_____

7.2. Have you referred a patient following a hysterectomy to other member(s) in the multidisciplinary team?

YES	UNSURE	NO

7.2a. If yes, please mention which member(s) in the multidisciplinary team the patient was referred to and the reason for referral.

_____

_____

_____

7.3. Do you give your patient advice upon discharge?

YES	UNSURE	NO

7.3a. *If yes, please provide a brief summary of the advice given to the patient.*

_____

_____

_____

Thank you for your participation in this study!!

Appendix M

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
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E-mail: jfrantz@uwc.ac.za

INFORMATION SHEET FOR PHYSIOTHERAPISTS

Project Title: Evidence to inform the development of Physiotherapy Guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

What is this study about?

This is a research project being conducted by Preshani Reddy at the University of the Western Cape. We are inviting you to participate in this research project because you are required to manage women who have undergone obstetric or gynaecological surgery. The purpose of this research project is to develop physiotherapy guidelines for HIV-infected and HIV non-infected women following gynaecological surgery. This will assist in improving the physiotherapy treatment given to patients following a caesarean section or hysterectomy.

What will I be asked to do if I agree to participate?

1. You will be asked to provide verbal and written consent (which will be provided by the researcher) in order to agree to participate in the study.
2. You will be requested to complete a self – administered questionnaire which will be conducted at the physiotherapy department in your hospital concerning the management rendered to patients following obstetric and gynaecological surgery.
3. The questionnaire takes about 15 minutes to complete and comprises of 25 questions.
4. There will be two boxes located in the physiotherapy department following completion of the questionnaire; you may place the questionnaire in one of the boxes and the consent form in the other.
5. All information will remain ***confidential.***

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, the survey is an anonymous survey and will be self- administered, so you ***DO NOT*** write your name on the questionnaire. The survey does not contain questions that will personally identify you. All results will be confidential. Once the completed questionnaires and consent forms are received, it will be locked away in a filing cabinet, which only the researcher will have access to. All data that is entered into the computer will be password protected by the researcher. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. In accordance with legal requirements and/or professional standards, we will disclose to the appropriate individuals and/or authorities information that comes to our attention concerning potential harm to you or others.

What are the risks of this research?
There are no known risks associated with participating in this research project.

What are the benefits of this research?
This research is not designed to help you personally, but the results will help the investigator learn more about the current physiotherapy management of patients following gynaecological surgery. We hope that in the future, patients' and health professionals might benefit from this study through the improved understanding of how to effectively and efficiently manage HIV-infected and HIV non-infected women following gynaecological surgery.

Do I have to be in this research and may I stop participating at any time?
Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

Is any assistance available if I am negatively affected by participating in this study?
The researcher will refer you for counseling at your current hospital to the relevant health care providers should you be negatively affected by the study in anyway.

What if I have questions?

This research is being conducted by ***Preshani Reddy*** at the University of the Western Cape. If you have any questions about the research study itself, please contact Preshani Reddy on;

Telephone: (031) 260-7974, cell: 0837997409, e-mail: reddypr@ukzn.ac.za or write to Physiotherapy Department, University of the Western Cape, Private Bag X17, Belville 7535

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department: Professor J. Phillips
Dean of the Faculty of Community and Health Sciences: Professor Mpofu
University of the Western Cape
Private Bag X17
Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee. Registration number:11/8/11

Appendix N

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2542, Fax: 27 21-959 1217

E-mail: jfrantz@uwc.ac.za

CONSENT FORM FOR PHYSIOTHERAPISTS

Title of Research Project: Evidence to inform the development of Physiotherapy Guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

***Participant's name*……..**

***Participant's signature*……..**

***Witness*……..**

***Date*……**

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Professor J. Frantz

University of the Western Cape
Private Bag X17, Belville 7535
Telephone: (021)959- 3661
Cell: 0828522527
Fax: (021)959-1217
Email: jfrantz@uwc.ac.za

Appendix O

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SYSTEMATIC REVIEW PROTOCOL

CURRENT PHYSIOTHERAPY TREATMENT TECHNIQUES ACCORDING TO LITERATURE

1. BACKGROUND OF THE STUDY

Physiotherapy has been involved in women's health since the early 20th century (Mantle, Haslam, & Barton, 2004). The role initially consisted of obstetric work and later moved on to include gynaecological work (Mantel et al., 2004). The field of treatment gradually expanded to include remedial exercises and incontinence (Mantle et al., 2004; Boissonnault, 2005). This 'new' area became known collectively as 'Women's Health' in the 1980's with a view to have a holistic approach in the management of patients (Mantle et al., 2004). Presently, physiotherapists play an essential role as part of the multidisciplinary team in the management of patients who have undergone obstetric and gynaecological surgery (Cook, 2004). As various fields or areas in physiotherapy evolved, so did the profession with physiotherapists been granted first line practitioner status in many countries. However, with this new found autonomy came the responsibility of accurate diagnosis, prognosis and effective patient-care (Herbert, 2005). Physiotherapists now needed to make informed decisions regarding patient care.

Informed decision making can stem from various sources such as past experiences and consulting with more senior physiotherapists or experts in the field. However, we are now in an era where people require proof and the use of evidence based practice is now second to none. The physiotherapy profession has previously been criticized for its use of anecdotal information, lack of research and limited evidence based (Turner, 2001). However, since the year 2000 the number of RCTs and systematic reviews in Physiotherapy has increased exponentially (Maher, Moseley, Sherrington, Elkins & Herbert, 2008). The new question that now arises is how do clinicians keep up to date with the new research being generated? (Maher et al., 2008). One such method to assist clinicians in this process is developing clinical practice guidelines (van der Wees & Mead, 2004). Field and Lohr (1992) stated

that “Guidelines are systematically developed statements designed to help practitioners and patients to make decisions about appropriate health care for specific circumstances. There are various frameworks used to guide the development of clinical guidelines but research into the area of Women’s Health prior to the commencement of the guideline development revealed a paucity of literature in postoperative complications specific to women post caesarean seciton delivery or hysterectomy. The researcher therefore amalgamated two frameworks namely the Intervention Mapping Model (Bartholomew, Parcel, Kok & Gottlieb., 2001) and the Dutch Physiotherapy Clinical Guidelines Framework (van de Wees, Hendriks, Custers, Burgers, Dekker & de Bie, 2007) to generation evidence to draft the clinical guidelines with the main phase in both the frameworks being to conduct a systematic review (van de Wees et al., 2007; Bartholomew et al., 2001). Thus the aim of this review is determine the most effective evidence-based physiotherapy treatment techniques for managing complications and/or potential complications following caesarean section delivery or hysterectomy.

2. RESEARCH QUESTION

The research questions for this systematic review are:

1. To determine what physiotherapy technique(s) are used to prevent or treat postoperative complications in patients following a caesarean section delivery.

2. To determine what physiotherapy technique(s) are used to prevent or treat postoperative complications in patients following a hysterectomy.

3. OBJECTIVES FOR REVIEW

The objectives of the review (linked to the research questions) were to highlight;

1a. To identify the types of preventative and treatment interventions in patients following a caesarean section delivery.

1b. The determine the outcomes of preventative and treatment interventions for patients following caesarean section delivery and;

1c. To formulate an evidence base for best practice methods in the prevention and treatment of complications in patients following a caesarean section delivery.

2a. To identify the types of preventative and treatment interventions in patients following a hysterectomy

Appendix O

2b. To determine the outcomes of preventative and treatment interventions for patients following a hysterectomy and;

2c. To formulate an evidence base for best practice methods in the prevention and treatment of complications in patients following a hysterectomy.

4. CRITERIA FOR ARTICLE SELECTION

4.1 Search words

The search words for caesarean section are depicted in table 1 and the search words for hysterectomy are depicted in Table 2.

Table 1: Caesarean section search terms

"obstetric surgery" "complication*" "physiotherapy Management"	"obstetric surgery" "Lower back pain" "physiotherapy Management"	“physical therapy management” "pelvic floor dysfunction" “caesarean section”
"obstetric surgery" "complication*" "Physical therapy management"	Obstetric surgery "Lower back pain" "physical Therapy Management"	“physiotherapy management” "pelvic floor dysfunction" “caesarean section”
“obstetric operation” “complication*” “physical therapy management”	Obstetric surgery "Lower back pain"	“physical therapy " “pelvic floor dysfunction" “caesarean section”
“obstetric operation” “complication*” “physiotherapy management”	Obstetric operation "Lower back pain"	“physiotherapy "pelvic floor dysfunction" “caesarean section”
"obstetric surgery" "physiotherapy management"	caesarean section "Lower back pain"	“physical therapy” “Obstetric operation " “pelvic floor dysfunction"
"obstetric surgery" "physical therapy management"	“physical therapy" “obstetric surgery" "Quality of life"	“physiotherapy Obstetric operation" ”pelvic floor dysfunction"
"Caesarean Section" "Complication*" Physiotherapy management	“physiotherapy" “obstetric surgery" "Quality of life"	“physiotherapy Obstetric surgery" ”pelvic floor dysfunction"
"caesarean section" "complication*" "physical therapy management"	“physiotherapy” "Obstetric operation" "Quality of life"	“physical therapy” “Obstetric surgery" “pelvic floor dysfunction"
"Caesarean Section" "Physiotherapy management"	“physical therapy "Obstetric operation" "Quality of life"	“physiotherapy management” "pelvic floor dysfunction"
"caesarean section " "physical therapy management"	“physical therapy" “caesarean Section" "Quality of life"	“physical therapy management" “pelvic floor dysfunction"
"caesarean section " "physical therapy"	“physiotherapy" “caesarean Section" "Quality of life"	“physical therapy” "Obstetric operation" "Quality of life"
physical therapy "obstetric surgery" "oedema"	“physical therapy” "obstetric surgery" "respiratory complications"	“physical therapy” "Obstetric operation" "Quality of life"
“physiotherapy" “obstetric surgery" "oedema"	“physiotherapy" “obstetric surgery" "respiratory complications"	“physical therapy” "Obstetric operation" "Quality of life"
“physical therapy” "obstetric operation" "oedema"	“physical therapy” "obstetric operation" "respiratory complications"	“physical therapy” "Obstetric operation" "Quality of life"
“physiotherapy" “obstetric operation" "oedema"	“physiotherapy" “obstetric operation" "respiratory complications"	“physical therapy” "Obstetric operation" "Quality of life"

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“physical therapy” "caesarean Section" "oedema"	“physical therapy” "caesarean section" "respiratory complications"	“physical therapy” "Obstetric operation" "Quality of life"
“physiotherapy” "Caesarean Section" "oedema"	physiotherapy "Caesarean Section" "respiratory complications"	“Physical therapy" “urinary incontinence” "caesarean section”
“Physiotherapy management” "urinary incontinence"	“Physiotherapy management” "urinary incontinence" “caesarean section”	“Physiotherapy” “urinary incontinence” "caesarean section”
“Physical therapy management” "urinary incontinence" “caesarean section”	"Physical therapy management" “urinary incontinence”	

Table 2: Hysterectomy search terms

“Physiotherapy management” “Pelvic floor dysfunction”	“Physiotherapy management” “gynaecological surgery” “urinary incontinence”	“gynaecological surgery” "complication*" "physiotherapy Management"
“Physical therapy management” “Pelvic floor dysfunction”	“Physical therapy management” “ gynaecological surgery” “urinary incontinence”	“Gynaecological surgery” "complication*" "Physical therapy management"
“Physiotherapy management” “gynaecological surgery” “Pelvic floor dysfunction”	“Physiotherapy management” “hysterectomy” “urinary incontinence”	“Gynaecological surgery” "physiotherapy management"
“Physical therapy management” “gynaecological surgery” “Pelvic floor dysfunction”	“Physical therapy management” “hysterectomy” “urinary incontinence”	“Gynaecological surgery” "physical therapy management"
“Physiotherapy management” “hysterectomy” “pelvic floor dysfunction”	“Physical therapy management” "urinary incontinence"	“hysterectomy” "Complication*" "Physiotherapy management"
“Physical therapy management” “hysterectomy” “pelvic floor dysfunction”	“Physiotherapy management” "urinary incontinence"	“hysterectomy "complication*" "physical therapy management"
“Hysterectomy” "Lower back pain" "physiotherapy Management"	“physical therapy” "Gynaecological surgery" "Quality of life"	“hysterectomy” "Physiotherapy management"
“hysterectomy” "Lower back pain" "physical therapy Management"	“physiotherapy "Gynaecological surgery" "Quality of life"	“hysterectomy “ "physical therapy management"
“Gynaecological surgery” "Lower back pain" "physiotherapy Management"	“physical therapy” "hysterectomy" "Quality of life"	“physical therapy” "Gynaecological surgery" "oedema"
“Gynaecological surgery” "Lower back pain" "physical therapy Management"	”physiotherapy” "hysterectomy" "Quality of life"	“physiotherapy" “Gynaecological surgery" "oedema"
“Gynaecological surgery” "Lower back pain"	“physical therapy” "Gynaecological surgery" "respiratory complications"	“physical therapy” "hysterectomy" "oedema"
“Hysterectomy” "Lower back pain"	“physiotherapy” "Gynaecological surgery" "respiratory complications"	“physiotherapy” "hysterectomy" "oedema"
“physical therapy” "hysterectomy" "respiratory complications"	“physiotherapy” "hysterectomy" "respiratory complications"	

The articles selected were then critiqued according to Population, Intervention, Comparison, Outcome, Type of question being asked (therapy, diagnosis, prognosis, harm, etc.) and the best Type of study design for that particular question (PICOTT) (Table 3).

Appendix O

Table 3: PICOTT criteria for caesarean section and hysterectomy article selection

Headings	Criteria
Population	▪ Women ≥ 18 yrs post caesarean section delivery ▪ Women ≥18 yrs post hysterectomy
Intervention	▪ Physiotherapy intervention ▪ Physiotherapy intervention for incontinence ▪ Physiotherapy intervention for incontinence and pelvic floor dysfunction ▪ Physiotherapy intervention for LBP ▪ Physiotherapy intervention for swelling Physiotherapy intervention for respiratory complications
Comparison	▪ No intervention ▪ Education ▪ Another intervention
Outcome	Self-reported and/or measureable outcome in: • Quality of life • Incontinence. • LBP • Swelling
Type of Question	▪ Does Physiotherapy intervention improve the patient's condition? ▪ Does Physiotherapy intervention improve the patient's Quality of life?
Types of Studies	▪ Randomised controlled trails ▪ Cohort Studies ▪ Quasi –experimental studies

5. DATABAES TO SERACH

The databases to search will be MEDLINE, CINAHL, Cochrane Library, PEDro (van de Wees & Mead, 2004) and Science Direct. Grey literature will be searched using PubMed, online conference proceedings from the World Confederation for Physical Therapy (WCPT) and the 'snowball method' where the references of selected articles will be hand searched as well as electronic citations. As per the World Conference of Physiotherapy website, the following guideline sites were also searched: Australian government, Canadian Medical Association information base of clinical practice guidelines, eGuidelines which was redirected to NICE, NICE, Guidelines international network, L'agencenationaled'accréditation et d'évaluation en santé (National French Guidelines), National Library for Health guidelines database which was redirected to NICE, New Zealand Guidelines Group, Scottish Intercollegiate Guidelines Network, US National Guidelines Clearing House, and the Guidelines and Audit Implementation Network. Experts in the women's health field will be contacted and the question will be posed on ResearchGate for reserchers to assist in the idetification or relevant articles.

Appendix O

6. INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria

- All English articles up till the time the systematic review is conducted will be reviewed
- International and National
- Women must be more than 18 years old
- Randomized Control trials or cohort studies for patients undergoing caesarean sections
- Randomized Control trials or cohort studies for patients undergoing a hysterectomy (Laparoscopic hysterectomy, vaginal hysterectomy or abdominal hysterectomy)
- Relevant trails to compare physiotherapy intervention(s) with no intervention or with each other.
- Interventions need to be administered more than once to the participants.
- Physiotherapy intervention(s) to prevent or treat bowel and/or bladder dysfunction post-surgery (caesarean section and hysterectomy).
- Physiotherapy intervention(s) to prevent or treat respiratory complications post-surgery (caesarean section and hysterectomy).
- Physiotherapy intervention(s) to prevent or treat lower back pain post-surgery Physiotherapy interventions to prevent or reduce swelling following surgery (caesarean section and hysterectomy).
- Effect of physiotherapy intervention on a patient's QoL following caesarean section and hysterectomy

Exclusion Criteria

- Inadequate randomization methods.
- Trials with patients with uncontrolled medical conditions
- Trials with patients with no differentiation in the results between type of delivery or mode of surgery.
- Case studies.
- Pilot studies

7. METHODS OF REVIEW

The of level of evidence from the NICE (2005) guideline development method will be used as shown in Table 4.

Appendix O

Table 4: Level of evidence for intervention studies

Level of evidence	Type of evidence
1^{++}	High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1^{+}	Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1^{-}	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias*
2^{++}	High-quality systematic reviews of case–control or cohort studies High-quality case–control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal
2^{+}	Well-conducted case–control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal
2^{-}	Case–control or cohort studies with a high risk of confounding bias, or chance and a significant risk that the relationship is not causal*
3	Non-analytic studies (for example, case reports, case series)
4	Expert opinion, formal consensus
***Studies with a level of evidence '–' should not be used as a basis for making a recommendation**	

7.1 Data storage

All data will be captured in a Microsoft Excel[tm] spreadsheet and selected articles will be stored in folders pertaining to the subject and the search. Each spreadsheet with be specific to the database being searched and will contain information pertaining to the authors and the title of the article.

7.2 Article screening process

Data will be extracted independently by two reviewers using the PICOTT tool. A third reviewer will be asked to adjudicate if the initial reviewers are unable to come to a consensus following a verbal discussion.

7.3 Data synthesis and extraction

The methodological quality of the data will be determined using the PEDro tool for RCTs (Verhagen, de Vet, de Bie, Kessels, Boers, Bouter, Knipschild, 1998) or the CASP tool for other study designs. For consistency if the search yields a mixture of study designs then the CASP tool will be used but should the search yield only RCTs then the PEDro tool will be used. The review will be performed independently by two reviewers. Discrepancies between the scoring will be discussed verbally; if consensus cannot be achieved, a third reviewer will

be requested to score the selected articles. Only articles rated adequate and above will be considered. The findings from the articles will then be summarized in narrative form under the following titles; references, key features, intervention, outcome measure, statistics, authors conclusions and comments. Authors from the articles selected will be contacted for missing information. The entire process will be overseen by the supervisor, who will also independently audited the process and the articles.

8. REFERENCES

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Delphi Survey - Round One

This survey comprises of 25 questions, which is divided into 3 sections and takes < 30minutes to complete. Section 1 is a demographic section. Section 2 and 3 will highlight the complications of HIV-infected and HIV non-infected women post-cesarean section delivery (CSD) and post hysterectomy respectively. The complications presented are based on the findings from my study six months postoperatively. Following the findings you will be required to suggest possible intervention strategies to prevent/ reduce the impact of the highlighted complications. At the end of each section you can suggest any intervention or treatment strategy that you feel should be included in the postoperative management of women post-CSD and post hysterectomy. this will aid in the development or clinical practice recommendations for women post-CSD and post hysterectomy. Once received, the information from each participant will be collated and sent as a second Delphi round for consensus. A third Delphi round will only be considered if consensus is not achieved in the second round. Consensus will be determined by the central tendencies and convergence of responses around a particular intervention/treatment reached. The time allocation per round is 2 weeks. A general 1 week reminder will be sent to everyone on the panel. A gap (maximum 2 weeks) for collation will be administered between the surveys.

This information received will be invaluable as it will assist us in improving the lives of millions of women. As a profession, the information will add to evidence based practice in Women's Health which will strengthen the role of physiotherapists amongst obstetricians and gynecologists. I would like to thank you in advance for your invaluable time and co-operation.

* Required

1. **Are you willing to participate in this Delphi Survey** *
This will serve as consent that you are willing to participate in the study. Please note that you can withdraw at anytime and anonymity will be maintained throught the survey.
Mark only one oval.

- ◯ Yes, I would like to participate in this survey *Skip to question 2.*
- ◯ No, I do not want to participate in this survey *Stop filling out this form.*

Section 1: Demographics

2. **1.1. What gender are you** *
Mark only one oval.

- ◯ Male
- ◯ Female

3. **1.2. What race are you** *
Mark only one oval.

- ◯ African
- ◯ Coloured (mixed ancestry)
- ◯ Indian
- ◯ White

4. **1.3. How old are you?** *
Mark only one oval.

- ◯ <30 years old
- ◯ 30 years - 40 years old
- ◯ 40 years - 50 years old
- ◯ > 50 years old

5. **Which province do you currently reside in?** *
If you are not South African, please state your country of origin.

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6. **1.4. What year did you qualify?** *

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7. **1.5. Do you hold any post-graduate qualification(s) in Women's Health?** *
Eg. Masters or PhD
Mark only one oval.

- ◯ Yes
- ◯ No

8. **1.5.1. If yes, please state your highest qualification**

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9. **1.6. Have you had postgraduate training in Women's Health?** *
Eg: courses
Mark only one oval.

- ◯ Yes
- ◯ No

10.

1.6.1. If yes, please list the courses you have attended.

11.

1.7. Please state how many clinical years of experience you have in Women's Health.

Section 2: Complications according HIV-infected and HIV non-infected women post cesarean section delivery.

Participants (N=310) were required to complete a questionnaire at four time points. The main findings at the last time point (month-6; N=301) are presented below:

12.

2.1. 55 participants (18.3%) still felt pain at the operation site. HIV infected-participants were more susceptible to having pain post-CSD. *

Please list specific intervention strategies to address the above eg. Laser for post-operative pain.

13.

2.2. 100 participants (33.2%) still struggled with performing vigorous activities. HIV infected-participants and participants who underwent an emergency CSD were more likely to struggle with running or lifting a table post-CSD. *

Please list specific intervention strategies to address the above eg: Core strengthening to improve the activity levels in HIV-infected women post-CSD.

14.

2.3. 43 participants (14.3%) still struggled with bending, kneeling or stooping. HIV-infected participants and participants who underwent an emergency CSD were more susceptible to the aforementioned complications post-CSD. *

Please list specific intervention strategies to address the above eg: Core strengthening or ergonomics to improve functional activity in HIV-infected women post-CSD.

Section 2 continued...

15.

2.4. 48 participants (16%) still had a problem with bladder control. HIV-infected participants, participants who had given birth to ≥ 2 children, participants who had urinary incontinence at baseline and participants who underwent an emergency CSD were more susceptible to have urinary incontinence post-CSD. *

Please list specific intervention strategies to address the above eg: Pelvic floor exercises in multiparous women post-CSD

16.

2.5. 110 participants (36.5%) still experienced lower back pain. *

Please list specific intervention strategies to address the above eg: Spinal mobiliastion and motor control in women with LBP post-CSD.

17.

2.6. Please list any other intervention or treatment strategies you feel would be beneficial in the postoperative magagement of following a CSD.

More than half way done! :)

Section 3: Complications according to HIV-infected and HIV non-infected women post hysterectomy

Participants (N=101) were required to complete a questionnaire at 4-time points. The main findings at the the last time point (month-6; N=95) are presented below:

18. **3.1. 46 participants (48.5%) still felt pain at their operation site. HIV-infected participants; participants who underwent a hysterctomy other than a total hysterectomy (sub-total hysterectomy, radical hysterectomy, total hysterectomy with bilateral salpingo-oophorectomy or radical hysterectomy with pelvic lymphadenectomy) with an abdominal incision were more susceptible to pain.** *
Please list specific intervention strategies to address the above eg: Laser for post-operative pain in HIV-infected women post hysterectomy.

19. **3.2. 87 participants (91.6%) still struggled with performing vigorous activities. Participants who had an abdominal incision were more susceptible to struggle with running and lifting heavy objects post hysterectomy.** *
Please list specific intervention strategies to address the above eg: Core strengthening on the activity levels in women post hysterectomy

20. **3.3. 28 participants (29.5%) still struggled with bending, kneeling or stooping. Participants who had an abdominal incision were more susceptible to struggle with the aforementioned complication post hysterectomy.** *
Please list specific intervention strategies to address the above eg: Core strengthening or ergonomics to improve functional activities in women post hysterectomy.

Section 3 continued...

Appendix P

21. **3.4. 40 participants (42.1%) still struggled with bladder control.** *
Please list specific intervention strategies to address the above eg: Kegal exercises for management of urinary incontinence in women post hysterectomy.

22. **3.5. 28 participants (32.7%) still experienced lower back pain. HIV non-infected participants and participants ≤60 years were more susceptible to LBP post hysterectomy.** *
Please list specific intervention strategies to address the above eg: Pre-operative core strengthening exercises for women undergoing a hysterectomy.

23. **3.6. 8 participants (8.5%) still experienced swelling in their lower-limbs. Participants who had an abdominal incision were susceptible to lower-limb swelling post hysterectomy.** *
Please list specific intervention strategies to address the above eg: Lymphatic drainage in women following a total abdominal hysterectomy.

24. **3.7. Please list any other intervention or treatment strategies you feel would be beneficial in the postoperative management of women following an hysterectomy.**

Appendix Q

Delphi Survey - Round 2

Thank you for your participation in round 2 of the Delphi study. In this round the information collated from round one will be presented. You are required to select on a scale (1-5) how likely (1 = very unlikely, 2 = unlikely, 3 = neutral, 4 = likely, 5 = very likely) you are to use the management strategies presented for the complication specified as well as for the additional management techniques mentioned for post-operative patients. At the end of each question you will be asked the reason(s) behind your 'likely and very likely' selections. This will provide a clear indication of research focus areas which will assist in the development of clinical guidelines for women post-CSD and post hysterectomy. The survey will be divided into 2 sections; section 1: Cesarean section delivery and section 2: Hysterectomy. The survey will take <30 minutes to complete. Thank you in advance for your assistance.

* Required

Section 1 - Cesarean section

1.1 The management of post-operative incision pain in patients post-CSD

1. **a.Laser** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

2. **b.TENS** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

3. **c. Ultrasound** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

4. **d. Early mobilisation** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

5. **e. Scar tissue massage** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

6. **f. Desensitization of the scar** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

7. **g. Trigger point therapy** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

8. **h. Pre-natal education and advice – precautions, ergonomics, kinetic handling, supported coughing** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

9. **i. Post-natal education and advice - ergonomics, kinetic handling and supported coughing** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

10. **j. Kineso-taping** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

11. **k. Exercise: abdominal muscle strengthening and general body conditioning** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

12. **l. Dry needling** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

13. **m. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-CSD; f - post-graduate course; g - CPD short course(s)

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1.2 The management of patients who struggle to perform vigorous activities post-CSD

14. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

15. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

16. **c. Retraining of core mobilizers** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

17. **d. Postnatal education and advice - ergonomics, kinetic handling, supported coughing, bracing during streneous activities** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

18. **e. Scar tissue massage** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

19. **f. Correction of diastasis recti** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

20. **g. Exercise: lower limb strengthening and general body conditioning** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

21. **h. Addressing foot pathologies** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

22. **i. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-CSD; f - post-graduate course; g - CPD short course(s)

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1.3 The management of patients who struggle to perform bending, kneeling and stooping

23. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

24. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

25. **c. Retraining of core mobilizers** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

26. **d. Postnatal education and advice - ergonomics, kinetic handling, supported coughing, bracing during streneous activities** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

27. **e. Graded strengthening exercise program - hip, lower limb and general body conditioning** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

28. **f. Temporary soft supportive brace for overweight patients** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

29. **g. Teaching the "Knack" maneuver** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

30. **h. Referral to occupational therapy for assessment and suitable devices.** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

31. **i. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-CSD; f - post-graduate course; g - CPD short course(s)

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1.4 The management of patients who experience bladder incontinence post-CSD

32. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

33. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

34. **c. Retraining of core mobilizers** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

35. **d. Biofeedback and neuromuscular stimulation of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

36. **e. Postnatal education and advice on bowel and bladder activity.** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

37. **f. Antenatal advice on pelvic floor muscle training** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

38. **g. Teaching the "Knack" maneuver** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

39. **h. Bladder retaining if indicated** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

40. **i. Behavioural therapy** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

41. **j. Temporary soft supportive brace for overweight patients** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

42. **k. Internal vaginal assessment prior to treatment** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

43. **l. Assessment - to determine if the problem is urge or stress incontinence including a bladder diary** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

44. **m. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-CSD; f - post-graduate course; g - CPD short course(s)

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1.5 The management of patients who experience lower back pain post-CSD

45. **a. Motor control exercises** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

46. **b. Spinal mobilisation** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

47. **c. Soft tissue mobiliastion and myofascial release** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

48. **d. Trigger point therapy** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

49. **e. Strapping/ kinesio-taping** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

50. **f. Postnatal advice on ergonomics and kinetic handling (incl.baby handling)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

51. **g. Electrotherapy** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

52. **If electrotherapy modalities are used, kindly specify the type of modailty below.**

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53.

h. Abdomino-pelvic muscle synergy retraining *

Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

54.

i. Muscle energy techniques *

Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

55.

k. Please state the reason(s) behind the 'very likely' and 'likely' selections. *

eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-CSD; f - post-graduate course; g - CPD short course(s)

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1.6. Other intervention or treatment strategies that should be included in management of patients undergoing a CSD

56.

a. Advice on sexual problems *

Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

57.

b. Advice on hemorrhoids *

Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

Appendix Q

58. **c. Education and advice on postnatal depression** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

59. **d. Advice on breast feeding** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

60. **e. Postnatal advice and education**

61. **f. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c - literature either general or specific to women post-CSD; d - post-graduate course; e - CPD short course(s)

Half way done!!! One more section to go! :)

Hysterectomy

2.1.The management of postoperative incision pain in patients post hysterectomy

62. **a. Laser** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

63. **b. TENS** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

64. **c. Ultrasound** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

65. **d. Ice** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

66. **e. Scar tissue massage** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

67. **f.Trigger point therapy** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

68. **g. Desentsitization of scar** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

69. **h. Strapping/ kineso-taping** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

70. **i. Postoperative education and advice - ergonomics, kinetic handling and supported coughing** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

71. **j. Temporary soft supportive brace for overweight patients** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

72. **k. Exercise: abdominal muscle strengthening and general body conditioning** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

73. **k. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-hysterectomy; f - post-graduate course; g - CPD short course(s)

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2.2 The management of patients who struggle to perform vigorous activities post hysterectomy

74. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

75. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

76. **c. Retraining of core mobilizers** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

77. **d. Strengthening gluteal muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

78. **e. Scar and soft tissue massage** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

79. **f. Kinesio-taping** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

80. **g. Abdomino-pelvic muscle synergy retraining** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

81. **h. Temporary soft supportive brace for overweight patients** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

82. **i. Post-operative education and advice - ergonomics, kinetic handling, breathing, bracing and supported coughing** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

83. **j. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-hysterectomy; f - post-graduate course; g - CPD short course(s)

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2.3 The management of patients who struggle to perform bending, kneeling and stooping post hysterectomy

84. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

85. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

86. **c. Retraining of core mobilizers** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

87. **d. Soft tissue mobilisation** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

88. **e. Bladder retraining if indicated** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

89. **f. Teaching the "knack" maneuver** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

90. **g. Biofeedback for training of the pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

91. **h. Exercise programe - strengthening of gluteal muscles and general** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

92. **i. Post-operative education and advice - ergonomics, kinetic handling, breathing and supported coughing** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

93. **j. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-hysterectomy; f - post-graduate course; g - CPD short course(s)

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2.4 Management of patients experiencing urinary incontinence post hysterectomy

94. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

95. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

96. **c. Teaching the "knack" maneuver** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

97. **d. Soft tissue mobilisation of tight structures** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

98. **e. Bladder retraining for urge incontinence** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

99. **f. Biofeedback and neuromuscular stimulation of the pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

100. **g. Abdomino-pelvic muscle synergy retraining** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

101. **h. Internal vaginal assessment prior to treatment** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

Appendix Q

102. **i. Assesment - to determine if the problem is stress or urge incontinence and the use of a bladder diary** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

103. **j. Preoperative education and advice on pelvic floor muscle exercises** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

104. **k. Postoperative education and advice - specific to toileting habits** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

105. **l. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-hysterectomy; f - post-graduate course; g - CPD short course(s)

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2.5 Management of patients who experienced lower back pain post hysterectomy

106. **a. Retraining (activation) of core stabilizers (eg. TrA, multifidus and pelvic floor muscles)** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

107. **b. Retraining (activation and strengthening) of pelvic floor muscles** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

108. **c. Electrotherapy** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

109. **If electrotherapy modalities are used, kindly specify the type of modailty below.**

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110. **d. Spinal mobilisation** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

111. **e. Soft tissue mobilisation and myofascial release** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

112. **g. Motor Control** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

113. **f. Exercise - lower limb strengthening and general body conditioning** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

114. **g. Neural mobilisation** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

115. **h. Postoperative education and advice on ergonomics and kinetic handling** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

116. **i. Abdomino-pelvic muscle synergy retraining** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

117. **j. Please state the reason(s) behind the 'very likely' and 'likely' selections.** *
eg: a - clinical experience; b,c,d,e - literature either general or specific to women post-hysterectomy; f - post-graduate course; g - CPD short course(s)

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2.6 Management of patients with lower-limb swelling post hysterectomy

118. **a. Lymphatic drainage** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

119. **b. Exercise - circulatory drills and general ROM exercises** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

120. **c. Prescribing anti-embolism stockings** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

121. **d. Encouraging early mobilisation** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

122. **e. Advice on positioning** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

123. **f. Referral to the appropriate member of the multidisciplinary team if needed** *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

Appendix Q

124.

g. Please state the reason(s) behind the 'very likely' and 'likely' selections. *
eg: a - clinical experience; b,c - literature either general or specific to women post-hysterectomy; d - post-graduate course; f - CPD short course(s) .

2.7 Other intervention or treatment strategies that should be included in the management of patients undergoing a hysterectomy

125.

a. Education on early menopausal changes *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

126.

b. Preoperative counselling *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

127.

c. Advice on attending a support group *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

128.

d. Early mobilization *
Mark only one oval.

	1	2	3	4	5	
Very unlikely	◯	◯	◯	◯	◯	Very likely

129.

e. Please state the reason(s) behind the 'very likely' and 'likely' selections. *
eg: a - clinical experience; b - literature either general or specific to women post-hysterectomy; c - post-graduate course; ? - CPD short course(s)

Appendix R

UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

20 September 2011

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Ms P Reddy (Physiotherapy)

Research Project: The development of Physiotherapy Clinical Guidelines for HIV-infected and HIV non-infected women following obstetric and gynaecological surgery.

Registration no: 11/8/11

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
Tel: +27 21 959-2948/9
Fax: +27 21 959 3170
Website: www.uwc.ac.za

Appendix S

health

Department:
Health
PROVINCE OF KWAZULU-NATAL

Health Research & Knowledge Management
10 – 103 Natalia Building, 330 Langalibalele Street
Private Bag x9051
Pietermaritzburg, 3200
Tel.: 033 – 395 2895
Fax.: 033 – 394 3782
Email.: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

Reference : HRKM 158/11
Enquiries : Mr X. Xaba
Telephone : 033 – 395 2805

Dear Ms P. Reddy

Subject: Approval of a Research Proposal

1. The research proposal titled **'The development of Physiotherapy Clinical Guidelines for HIV infected and HIV non-infected women following obstetric and gynaecological surgery'** was reviewed by the KwaZulu-Natal Department of Health.

   The proposal is hereby approved for research to be undertaken at *Inkosi Albert Luthuli, King Edward VIII, Mahatma Gandhi and R.K. Khan Hospitals*. Data collection is scheduled until end of March 2012.

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba.

Yours Sincerely

Dr E. Lutge
Chairperson: Provincial Health Research Committee
KZN Department of Health
Date: 7/11/2011.