PATIENTS’ AND NURSES’ KNOWLEDGE AND UNDERSTANDING OF LAPAROSCOPIC SURGERY

by

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MASTERS OF ARTS

in the subject

HEALTH STUDIES

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROFESSOR E POTGIETER

JUNE 2013
DECLARATION

I declare that the research study “PATIENTS’ AND NURSES’ KNOWLEDGE AND UNDERSTANDING OF LAPAROSCOPIC SURGERY” is my own work and that all the sources used or quoted have been indicated and acknowledged by means of complete references and that this work has never been submitted for any other degree at any other institution.

22 February 2013
DATE
PATIENTS’ AND NURSES’ KNOWLEDGE AND UNDERSTANDING OF LAPAROSCOPIC SURGERY

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ABSTRACT

A quantitative descriptive study was conducted to establish professional nurses’ and patients’ knowledge and understanding of laparoscopic surgery and to determine whether nurses are sufficiently knowledgeable to disseminate adequate information about laparoscopic surgery to patients. Two state hospitals based in KwaZulu-Natal where laparoscopic surgery is done were selected and the respondents were selected through convenience sampling. Data were collected by administering questionnaires to theatre nurses (n=39), ward nurses (n=87) and patients (n=42) scheduled for laparoscopic surgery.

The SPSS version 15 for Windows was used to compute the results. The findings revealed that the professional nurses were not sufficiently knowledgeable about laparoscopic surgery to give adequate information to patients and the patients themselves were not fully informed about all aspects of laparoscopic surgery including the possibility of conversion to open surgery, complications and advantages and after care. There is therefore a dire need for improvement of patient education to assist patients gaining optimal recovery.

KEY CONCEPTS

Laparoscopic surgery, pre-operative, intra-operative, post-operative, complications, informed consent, ward nurses, theatre nurses, patient education.
ACKNOWLEDGEMENTS

• Firstly, I would like to honour and convey my sincerest gratitude to Professor E Potgieter without whose assistance the completion of this study would not have been possible. Her tolerance, continuous assistance even during her vacation and guidance during the writing of my thesis is really appreciated. Her knowledge, insight, competence and moral support have also helped me develop both personally and professionally.

• I should also like to thank Prof MC Bezuidenhout of the Ethics Committee of UNISA for approving my questionnaires and granting me the go ahead to complete this study.

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• I would also like to place on record my sincere thanks to Dr MEL Josua, the Medical Manager of the Department of Health, for giving me approval to conduct this research at both these hospitals.

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• Lastly, I wish to thank the Lord, for his divine and spiritual guidance in completing this study.
Dedication

I would like to dedicate this dissertation to my late father, Mr Prahladh Kalpee who admired nurses.

This is my sole motivation to pursue the Master’s Degree in Health Sciences and enhance my career in nursing.
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<td>CO₂</td>
<td>Carbon Dioxide</td>
</tr>
<tr>
<td>CCD</td>
<td>Charge coupled device</td>
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<td>CPNU</td>
<td>Canadian Federation of Nurse Unions</td>
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<td>HALD</td>
<td>Hand assisted laparoscopic live-donor nephrectomy</td>
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<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Laparoscopic surgery caused a major turning point in surgery during recent years and has become a popular technique used by surgeons. It is a technique used for abdominal surgery whereby minimal access is gained into the abdomen providing the same results as open surgery (Rothrock 2007:318). Minimal invasive surgery is performed with instruments being manipulated from outside the body by the surgeon (Zinner & Ashley 2007:6). This modern surgical technique has transformed the practice of surgery making it possible for surgeons to perform major operations through small incisions, sometimes less than 1 cm, rather than larger incisions as in traditional open surgery. Due to the benefits of laparoscopic surgery which includes reduced postoperative pain, shortened hospital stay, improved cosmetic results, cost effectiveness and patient demand, this type of surgery is on the increase (Knol 2008:892-899).

Research done at the Academy Medical Centre in Khartoum, Sudan, proved that patients were generally satisfied with the results of laparoscopic surgery and that its popularity was increasing in Sudan (Salam, Own, Kareem, Hameed, Yak & Zaki 2005:10). Hosseini, Mousavinsab, Rahmanpour and Vakili (2008:84), affirm the popularity of the laparoscopic approach and state that although the equipment and the instrumentation is delicate it is apparently a good approach and the first choice for emergency cholecystectomy. Champault, Vons, Dagher, Amerlinck and Francoi’s (2002:1602) study on 112 patients undergoing laparoscopic cholecystectomy between 1997 and 2002, proved that if simple measures were used it was possible to decrease the operating room cost and still maintain good results. According to Amoli, Hassan, Ali, Far and Khashayar (2008:9), laparoscopic cholecystectomy is even a safe procedure to perform on pregnant women during the first and second trimesters of pregnancy. Breen and Ashley (2000:43-45), concludes that the success of laparoscopic cholecystectomies and its significant impact on general surgery, has led to the removal of other organs such as the appendix and adrenals laparoscopically. In fact virtually any abdominal operation can be performed through a laparoscope.
Although many studies report on the success of laparoscopic surgery, there are also studies indicating negative implications. Chen, Leff, Simpson, Chadwick and McDonald (2006:482, 483) found in his study that patients were not provided with adequate information to enable them to make an informed decision when requested to give consent for laparoscopic surgery. Consultants apparently omitted to mention the complications of this type of surgery to prospective patients.

Informed consent is regarded as an ethical cornerstone of health care from a legal as well as a moral viewpoint (Beauchamp & Childress 2001:78). Nurses are advocates for patients meaning that they need to ensure that the patient is aware of his or her rights and in the case of the consent taking, has the necessary knowledge of the operating procedure to make an informed decision. The patient must be made aware of all options including the possible outcomes of each option, the likely outcome with no treatment and the implications that each option will have on future lifestyle. If this does not happen it is the nurse’s responsibility to intervene and notify the doctor (Pera & Van Tonder 2011:79).

1.2 BACKGROUND TO THE PROBLEM

According to the Annals of the Royal College of Surgeons of England, a study conducted by Chen, Leff, Simpson, Chadwick and McDonald (2006:482, 483), compared the variations in practices to obtain consent from patients amongst trainees and consultant surgeons, for laparoscopic cholecystectomy, with specific reference to the documentation of significant risks. Eighty patients who had a laparoscopic cholecystectomy from February 2003 to February 2004 were chosen excluding those patients scheduled for open cholecystectomy and those whose consent forms and notes could not be located. There was a considerable variation of information provided by the three grades of clinicians involved in obtaining a patient’s consent with the trainees being more apt at giving these consents than the consultants. It was discovered that other than conversion to open cholecystectomy, bleeding and infection, there appeared to be no consensus on what complications needed to be discussed with the patient. It was deduced that patients were not provided with consistent information to make an informed decision. Consultants who took consent omitted the mentioning of complications which made them more prone to legal implications. As a result of this
study, surgeons in Queensland and Cambridge have adopted the introduction of a preprinted consent form detailing significant complications and therefore eliminating the disparity amongst clinicians.

Omundsen, Dennett and Walker (2008:49-51) report that patients having a diagnostic laparoscopy often leave the hospital dissatisfied and with a poor understanding of their discharge diagnosis. Hollenbeck, Diagnault, Johnston, Roberts and Wolf (2007:1025), proclaim that baseline health status and preoperative processes which includes the planning of the procedure and the surgical approach, strongly influence post-operative recovery.

The National Health Act No. 61 of 2003 section 6(1), stipulates that every health care provider must inform the user of the user’s health status unless disclosure would prove contrary to the user’s best interests, the range of diagnostic procedures and options available to the user, the benefits, risks, costs and consequences related to each option and the user’s right to refuse health services and to explain the implications, risks and obligations of such refusal (Pera & Van Tonder 2011:79).

According to Pera and Van Tonder (2011:85), the reasons for a nurse to act as a patient’s advocate is for the quality of care that the patient receives, the patient’s access to care, the patient’s awareness of the care, its effects and side effects and the patient’s understanding of the alternatives to the proposed treatment. Witnessing a patient giving consent to an operation by a nurse implies accountability on the part of the nurse, hence the importance of being knowledgeable about the operative procedure. Accountability is when a person who has to carry out an action needs to know the reasons and possible consequences of such actions and therefore accountability never involves actions that are automatic. However, Pera and Van Tonder (2011:79), contend that although the nurse is legally required to ensure that there is proper informed consent, there is no clear course of action when a nurse believes that the patient has not been well informed and the doctor is uncooperative in remedying the situation.

1.3 PROBLEM STATEMENT

During consent checking in the pre-operative holding area in the Operating Theatre in a government aided hospital in KwaZulu-Natal, the researcher found that many patients
allegedly did not know the difference between open surgery and laparoscopic surgery and were too afraid to ask questions. Those patients who did ask questions could not understand the terminology used due to communication barriers, and related mainly to language barriers. Patients who already signed the consent for the laparoscopic surgery procedure, asked questions to the theatre nurses – information that they should have had before they signed the consent document. It became evident that not all patients were well informed about laparoscopic surgery and that some nursing staff could not explain the laparoscopic procedure to patients or answer patients’ questions.

1.4 RESEARCH QUESTIONS

The following research questions were formulated in the context of the study:

- Are patients well informed about laparoscopic surgery?
- What are the patients’ knowledge and understanding of laparoscopic surgery?
- Do theatre and ward nurses have sufficient knowledge about laparoscopic surgery to inform patients?

1.5 PURPOSE OF THE STUDY

The purpose of this study was to establish professional nurses’ and patients’ knowledge and understanding of laparoscopic surgery and to determine whether nurses are sufficiently knowledgeable to disseminate adequate information about laparoscopic surgery to patients.

1.6 OBJECTIVES OF THE STUDY

The objectives of the study were the following:

- To identify operating theatre and ward nurses' knowledge and understanding of laparoscopic surgery
- To establish whether patients are adequately informed pre-operatively about laparoscopic surgery
- To determine the patients' knowledge and understanding of laparoscopic surgery
1.7 SIGNIFICANCE OF THE STUDY

Although laparoscopic surgery has been in existence for over 10 years, it is a fairly new concept to patients and the results of this study may indicate whether there are deficiencies in patients’ and nurses’ knowledge about the implications and complications of laparoscopic surgery. Once nurses’ and patients’ knowledge and understanding of laparoscopic surgery is determined, recommendations could be made for improving the nurses’ knowledge to enable them to provide patients with adequate information and health care. This could lead to better informed patients who would be able to make informed decisions as to whether they preferred to have a laparoscopic procedure being performed rather than traditional open surgery. Patients who are adequately informed about laparoscopic surgery will be better prepared to take care of themselves after the surgery.

If nurses are equipped with sufficient knowledge about laparoscopic surgery and its complications it may enable them to render improved quality care to these patients after the surgery. It is therefore critically important that nurses need to come to terms with the fact that laparoscopic surgery is the future and the current trend and therefore having the necessary knowledge is imperative so that the information imparted to patients is factual and accurate to facilitate optimal health care for patients.

1.8 DEFINITIONS OF KEY CONCEPTS

There are two kinds of definitions, namely, a dictionary or conceptual definition and an operational definition. A conceptual definition conveys the general meaning of the concept and uses words to define the properties of something. An operational definition assigns meaning to a variable and describes the activities required to measure it (Brink 2000:95).

**Surgery** refers to the medical treatment of bodily injuries or disorders by cutting open the body and removing or repairing parts (South African Pocket Oxford Dictionary 2006:915). Surgery is the branch of medicine concerned with diseases and trauma requiring operative procedures (Mosby’s Dictionary of Medicine, Nursing and Health Professions 2006:1799).
Laparoscopy is a technique which examines the abdominal cavity with a laparoscope (a type of endoscope consisting of an illuminated tube with an optical system) through one or more incisions in the abdominal wall usually at the umbilicus (Mosby's Dictionary of Medicine, Nursing and Health Professions 2006:1063).

Laparoscopic surgery refers to minimally invasive surgery where the surgery is performed with instruments (rather than the surgeon's hands) inside the body yet manipulated from outside the body and the incisions made are about 5-10 mm each (Rothrock 2007:318).

Laparotomy is any surgical incision into the peritoneal cavity usually performed under general or local anaesthesia often on an exploratory basis (Mosby's Dictionary of Medicine, Nursing and Health Professions 2006:1063). According to Rothrock (2007:315) and Phillips (2007:665), laparotomy is an opening made into the peritoneal cavity with incision being much bigger than 10 mm.

Preoperative phase pertains to the period before surgery and it begins when the surgery is scheduled and ends with the induction of anaesthesia on the operating table (Mosby's Dictionary of Medicine, Nursing and Health Professions 2006:1517). In this study, the pre-operative phase begins when the decision to proceed with the surgical intervention is made and ends with the transfer of the patient onto the operating theatre table (Phillips 2007:28).

Post-operative phase begins with the patient's emergence from anaesthesia and continue through the time required for the acute effects of the anaesthetic to abate (Mosby's Dictionary of Medicine, Nursing and Health Professions 2006:1501). In this study the post-operative phase pertains to the period of time after surgery.

Knowledge is information and skills gained through experience and education (South African Pocket Oxford Dictionary 2006:500). In this study, knowledge refers to what the patients and nurses should know about the laparoscopic procedure and the factual information.

Understanding: to understand is to perceive the meaning of something, to have insight into some related concept (The Concise Oxford Dictionary 1982:1169). In this study,
understanding refers to the nurses’ and patients’ insight into the advantages and complications of laparoscopic surgery.

**Complication** refers to a secondary disease or condition which makes an already existing one worse (South African Pocket Oxford Dictionary 2006:176). In this study, complication refers to a disease or injury that develops during or after laparoscopic surgery (Mosby’s Dictionary of Medicine, Nursing and Health Professions 2006:432).

**Professional nurse:** According to the Nursing Act No. 33 of 2005 (South Africa 2005:34), a Professional nurse is a person qualified and competent to independently practice comprehensive nursing in the manner and to the level prescribed and who is capable of assuming responsibility and accountability for such practice. Professional nurses must be registered with the South African Nursing Council.

**Theatre nurse:** Refers to a professional nurse working in the operating theatre assisting the surgeon during an operation (scrub nurse).

**Ward nurse:** Refers to professional nurses working in a surgical ward in a health care facility.

**Informed consent:** Refers to permission obtained from a patient to perform a specific test or procedure (Mosby's Dictionary of Medicine, Nursing and Health Professions 2006:978). In this study, an informed consent is a process where explanations of the procedure, risks, benefits and alternatives of a procedure are made verbally to the patient’s level of understanding (Phillips 2007:44).

**Sufficient** means enough or adequate in amount or number according to the need (Oxford Concise Dictionary 1982:1066). In this study, sufficient refers to the essential factual knowledge nurses should have with regard to the advantages, risks, contraindications, disadvantages, complications, procedure and aftercare of laparoscopic surgery.

**Adequate** means proportionate to the requirements in a given situation (Oxford Concise Dictionary 1982:12). Adequate information in this study refers to factual knowledge about the advantages, risks and complications of laparoscopic surgery and the aftercare
with regard to normal daily activities.

1.9  RESEARCH METHODOLOGY AND DESIGN

Polit and Beck (2010:566) define research design as the overall plan for addressing a research question, including strategies for enhancing the study’s integrity. A more detailed review of this section appears in chapter 3 and the under mentioned discussion is merely a brief overview of the research methods.

1.9.1 Research design

A quantitative descriptive research design was used in this study to determine patients’ and nurses’ knowledge and understanding of laparoscopic surgery. According to Polit and Beck (2008:763), quantitative research is the investigation of phenomena that lend themselves to precise measurement and quantification, often involving a rigorous and controlled design. The purpose of a quantitative study according to Parahoo (2006:49-50), is to measure concepts or variables objectively and to examine by numerical and statistical procedures the relationship between them. Consequently, a quantitative approach was followed in this study by assigning numerical values to the knowledge and the understanding of nurses’ and patients’ knowledge about laparoscopic surgery.

1.9.2 Descriptive research

The type of research used was descriptive because it involved describing aspects of a situation as it naturally occurred (Polit & Beck 2008:274-275). The researcher felt that a descriptive research design was appropriate for this study because it explored and described the respondents’ knowledge and understanding of laparoscopic surgery while they were either patients in the hospitals or nurses working in the hospitals.

1.9.3 Study setting

The research study was confined to two Government Hospitals in KwaZulu-Natal, namely, the King Edward VIII Hospital and the Albert Luthuli Hospital. These hospitals were chosen because they are regionally based and are tertiary hospitals having
laparoscopic surgeries performed on a daily basis. The other reason was that these hospitals were easily accessible to the researcher.

1.9.4 Target population

The target population consisted of professional nurses rendering nursing care to patients who had laparoscopic surgery and patients who had undergone laparoscopic surgery. The target population thus included operating theatre nurses and nurses working in the surgical wards and patients who were scheduled for laparoscopic surgery in the two selected government hospitals. Letters of Informed Consent and approval were given by the Management of the two hospitals and the Department of Health endorsed the consent to conduct this study.

1.9.5 Sampling technique and selection of the sample

Convenience sampling as a non-probability sampling technique was chosen because the study involved specialised surgery which usually occurs less frequently in operating theatres as compared to other surgeries making the population for study less accessible and limited. The patients used as respondents were those that were undergoing laparoscopic surgery and the nurses who rendered nursing care to these patients. This justified the use of the convenience sampling method. Objectivity is important and essential because of the specialised nature of the study and it is also important to note that the selection of the sample in the context of the empirical or field investigation prompted the researcher to follow this strategy (Brink 2008:132; Polit & Beck 2010:309, 312). Convenience sampling was done during the period of data collection. Those patients and nurses who met the inclusion criteria and were available on the days that the researcher visited the two hospitals were subsequently included in the sample (Parahoo 2006:266).

Thus, the selected sample included 50 operating theatre nurses, 90 ward nurses and 42 patients who were scheduled for or had laparoscopic surgery in two government aided hospitals in KwaZulu-Natal. A total of 182 questionnaires were distributed of which 14 questionnaires were not returned. The sample size therefore consisted of 39 operating theatre nurses, 87 ward nurses and 42 patients.
1.9.6 Use of a structured questionnaire

The primary data collection instruments were structured questionnaires which were administered to 2 categories of respondents. Thus, two questionnaires, one to be completed by the surgical ward and operating theatre nurses and another to be completed by patients, were developed to gather the data for this study. A questionnaire is a printed self-report form designed to elicit information through written or verbal responses of the subjects and it is consistent although in comparison to an interview it lacks depth (Burns & Grove 1999:272).

Questionnaires provide a great sense of anonymity and therefore gave the respondents an opportunity to answer the questions honestly without fear of or any undue influence.

1.10 ANALYSIS OF THE DATA

The data collected was coded and analysed using the Statistical Package for Social Sciences (SPSS) version 15 for Windows. The service of a statistician was solicited to conduct the statistical analysis. Descriptive statistics were used to synthesise and describe data as defined by Polit and Beck (2010:392) and in this study it was used to analyse data in relation to each question. A pretest was done to ensure content validity and reliability of the questionnaire and to identify flaws prior to the administration of the questionnaires to the two categories of respondents (Polit & Beck 2008:762).

Descriptive statistics were used to describe and summarise data. The response to both questionnaires were edited and then captured to form a data set for analysis. This process involved converting the collected data into an organised, visual representation so that it facilitated data analysis. In addition, it gave the study credibility of the findings since measures such as frequency distributions were employed (Brink 2000:179). Polit and Beck (2010:555) define frequency distributions as a systematic array of numeric values from the lowest to the highest together with a count of the number of times each value was obtained. Any quantitative study in which the data are numerical, the data analysis begins with descriptive statistics or used primarily to describe the characteristics of the sample from which the data were collected and to describe values obtained from the measurement of variables (Burns & Grove 1999:304). Data are presented in frequency tables, pie and bar graphs.
1.11 VALIDITY AND RELIABILITY

Validity is a quality criterion referring to the degree to which inferences made in a study are accurate and well founded (Polit & Beck 2010:571). Reliability refers to the consistency of a particular method in measuring or observing the same phenomena (Parahoo 2006:36). Polit and Beck (2010:566) define reliability as the degree of consistency or dependability with which an instrument measures an attribute. The concepts of validity and reliability will be discussed in detail in chapter 3.

1.12 ETHICAL CONSIDERATIONS

Ethical clearance to conduct the study was obtained from the Research and Ethics Committee of the Department of Health Studies at the University of South Africa (UNISA). Permission was sought from the Department of Health and the various hospital authorities of the selected hospitals in KwaZulu-Natal where the data was collected. The nurses in charge of the theatres and the wards were informed that approval had been given to conduct the research at the two hospitals. The letter requesting permission and the approval given was shown to the respondents. Ethical considerations are discussed in detail in chapter 3.

1.13 OUTLINE OF THE STUDY

Chapter 1 Provides an orientation to the study.

Chapter 2 Involves the literature review.

Chapter 3 Discusses the research methodology and design.

Chapter 4 Highlights the analysis of results and discussion of the findings.

Chapter 5 Comprises a summary of the main findings, conclusion and recommendations.
This chapter provided an overview of the problem statement, objectives, the research questions, the significance of the study, the research methodology and design. A quantitative descriptive research design was chosen using structured questionnaires to collect data on the knowledge and understanding of patients’ and professional nurses’ about laparoscopic surgery. The next chapter discusses the literature overview.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the literature review conducted for the study. According to Polit and Beck (2008:106, 757), a literature review is a critical summary of research on a topic of interest, often prepared to put a research problem in context. A literature review helps to lay the foundation for a study and can also inspire new research ideas. A literature review provides useful information by increasing one’s understanding of a topic or issue e.g. in this case, laparoscopic surgery which is a fairly new concept. In order to obtain ideas before and during the study, a literature review is mandatory. It provides a rationale for the study and informs researchers of the importance of a topic (Parahoo 2006:126-128) and also how to interpret findings. The literature review helps in contributing to the existing body of knowledge in a specialised field and adds new perspectives in a particular domain of interest (Polit & Beck 2010:170).

The literature review highlights laparoscopic surgery and discusses related research studies with emphasis on the advantages, disadvantages and complications associated with this type of surgery. Secondary sources were mostly used to build a strong theoretical framework and involved a thorough review of related text books, journals, the Internet and studies conducted by renowned authors specialising in laparoscopic surgery.

2.2 LAPAROSCOPIC SURGERY

According to Rothrock (2007:318) and Zinner and Ashely (2007:6), the laparoscopic approach is a technique used in abdominal surgery by gaining minimal access into the abdomen to achieve the same surgical result as an open laparotomy. This type of surgery is often referred to as minimally invasive surgery where surgery is performed with instruments inside the body rather than the surgeon’s hands but the instruments
are manipulated from outside the body. Almost all general surgery procedures can be performed using minimally invasive techniques.

The terminology minimal invasive surgery was introduced by John Wickham, but according to Cuschieri (2005:125-138), this terminology was incorrect because invasive meant absolute and minimal gave the impression that the procedures were minor which is not true and he felt that the terminology minimal access surgery was more appropriate. According to Zinner and Ashley (2007:1099), the increase in the use of this kind of technique was due to patients needing less painful operations and quicker postoperative recovery.

2.2.1 History of laparoscopic surgery

In 1910, Hans Christian Jacobaeus of Stockholm, Sweden, reported the first laparoscopy and thoracoscopy in humans in which he described the endoscopic diagnosis of intra-abdominal tuberculosis, cirrhosis, syphilis and malignancy. He also introduced the concept of creating a working space by inflating air into the peritoneum and viewing the abdominal contents using a Nitze cystoscope (Phillips 2007:642). In the post-war period in Germany, due to sparse economic resources laparoscopes were increasingly used so that smaller incisions, quicker recovery and shorter less costly hospital stays were possible. In 1924, Richard Zollikofer of Switzerland recommended the use of carbon dioxide (CO₂) to create a pneumoperitoneum and this was preferred over oxygen and nitrogen because of its inflammable nature and rapid re-absorption by the peritoneum (Phillips 2007:642).

The veress needle as the preferred route of insufflations was introduced by Janos Veress in Hungary in 1938. This device comprised of a spring loaded blunt obturator at its tip which protected the internal viscera from the sharp needle tip once it had penetrated the fascia and the peritoneum (Phillips 2007:642). In 1985 the charge coupled device (CCD) silicone chip solid state image sensor – the miniature video camera was developed which allowed all members of the operating team to view the operative field simultaneously. The CCD is composed of small picture elements called a pixel which in the presence of light becomes conductive and in the absence of light remains non-conductive. These pixels sense red, blue or green light. The picture is made up of conductive and non-conductive pixels (Rothrock 2007:195-196). In 1987,
Mouret, a gynaecologist, performed the first laparoscopic cholecystectomy using four trocars. It was Dubois who in 1988 initiated interest in the procedure and since then there has been an explosive increase in the use of laparoscopic techniques for abdominal operations (Zinner & Ashley 2007:6).

2.2.2 Advantages of laparoscopic surgery

Minimal access surgery offers considerable advantages over more traditional open surgery and due to the absence of a large abdominal incision, less postoperative discomfort is experienced although there may be muscle discomfort in the port where there was manipulation of instruments. This also offers shorter recovery time, less pain and improved surgical outcome. The advantages of laparoscopic surgery are extensively reported on in the literature.

2.2.2.1 Decreased pain, reduced hospitalisation and early recovery

According to Wilmore, Sawyer and Kehlet (2001:473-476), minimal access surgery combines different techniques used in the care of patients undergoing elective surgery. The methods used include minimally invasive techniques, epidural or regional anesthesia, optimal pain control and aggressive postoperative rehabilitation, including early nutrition and ambulation. These approaches shorten recovery time, reduce stress response and organ dysfunction and improve surgical outcomes. These authors also associate minimally invasive surgery with a decrease in various inflammatory responses and immune dysfunctions, improvement of pulmonary dysfunction and reduced postoperative ileus.

Bhattacharya (2004:22-23) affirms that laparoscopic procedures leads to less pain, small scars, early discharge and return to work and fewer analgesics and therefore indications of selection of patients undergoing such procedures have been expanded. Keulemans, Eshvis, De Haes, De Wit and Gouma (1998:734-740), report on a study to determine feasibility and desirability of laparoscopic cholecystectomy in day care versus clinical observation. Objections were raised in Europe about possible early severe complications (bleeding) and the patient’s feeling of safety if being observed for one night only which resulted in this study being carried out. Eighty patients received laparoscopic cholecystectomy. Of the 37 patients assigned to the day care group 92%
were discharged successfully after a period of plus minus three hours and the remainder was admitted and observed for twenty-four hours. It was concluded that effectiveness existed in both groups and because day care surgery was cheaper it was therefore the method of choice in the United States.

Rothrock (2007:318) contends that minimal access surgery offers a faster recovery of pulmonary function, fewer postoperative complications, less potential for surgical site infections, improved cosmesis due to the fact that the incisions are small, a shorter recovery period with reference to post-operative flatus and small bowel movement including resumption of oral intake which takes place a day sooner than with conventional surgery. He also mentions a quicker return to former activities of daily living.

A study was conducted by Kikuchi, Takeuchi, Shimanuki, Kitade, Kumakin, Kuroda, Kobayashi and Takeda (2008:16-19) on recovery of activities of daily living after laparoscopic surgery. The findings showed that it was quick i.e. within a month and it differed because of various factors including sensitivity to pain, character and living environment of the patients. Hosseini, Mousavinasab, Rahmanpour and Vakili (2008:84-88), compared the outcomes between acute open and acute laparoscopic cholecystectomy and found it to be significantly different with regard to hospital stay and major post-operative complications.

Baraza (2005:473-476) affirms that at the Nairobi hospital in Kenya, it had been deduced that although the cost of laparoscopic equipment was high and surgeons were discouraged due to the learning curve, laparoscopic surgery did offer advantages like safety, patient satisfaction, less pain than in the traditional method, shorter hospital stay and early return to work.

2.2.2 Decreased morbidity and mortality

A study conducted by Rosenmuller, Haapamaki, Nordin, Stenlund and Nilsson (2007:35) involved patients being discharged from hospitals and the death certificate data linked for all patients undergoing cholecystectomy in Sweden from 1st January 2000 to 1st December 2003. The results showed that laparoscopic cholecystectomy in the general Swedish population is performed on patients with low mortality and that
patients with open cholecystectomy were more sick than patients with laparoscopic cholecystectomy and they had a mortality risk within 90 days of admission for cholecystectomy. Their study concluded that hospital stay was longer for patients who had an open cholecystectomy as compared to patients undergoing laparoscopic surgery. Patients who had open cholecystectomy were older, had a higher rate of emergency admission and a higher co-morbidity whereas patients with laparoscopic cholecystectomy had a significantly reduced standardised mortality ration. The authors found it was appropriate to consider the use of small incision cholecystectomy if expertise was available.

According to Tayeb, Khan and Riaz (2008:66-69), their study: “Laparoscopic Cholecystectomy in cirrhotic patients: Feasibility in a developing country,” showed positive results because it confirmed that laparoscopic surgery can be performed safely in compensated cirrhotic patients with acceptable mortality and morbidity. Issa, Al-Rashedy, Ballester and Ammori (2005:90-93) affirm that the duration of laparoscopic surgery have no impact on the duration of the post-operative hospital stay.

2.2.2.3 Safeness of laparoscopic surgery with regard to gynaecological emergencies

Amoli, Tavakoli, Notash, Far and Khashayar (2008:9-14) conducted a study on 6 women in their first and second trimester of pregnancy who went for a laparoscopic cholecystectomy. One of the two patients who was in the first trimester, after having a laparoscopic cholecystectomy underwent termination of pregnancy whilst the other gave birth to a term child. Four patients underwent laparoscopic surgery during their second trimester, two of which delivered term babies and two underwent caesarean section affirming that laparoscopic surgery was safe for women in their first and second trimester. Laparoscopic surgery is firmly established as the best intervention in acute Appendicitis, acute Cholecystitis and most Gynaecological emergencies (Warren, Kiross, Paraskeva & Darzi 2006).
2.2.2.4 Organ donation

A study conducted by Abdelshafy (2007:188-192) showed that hand assisted laparoscopic live-donor Nephrectomy is a safe minimally invasive procedure resulting in excellent allograft function which could increase donation. Hand assisted laparoscopic live-donor nephrectomy (HALDN) improves outcomes and results in increased kidney donation. Wilmore, Sawyer and Kehlet (2001:473-478) associate minimally invasive surgery with reduced stress response and organ dysfunction and a decrease in various inflammatory responses and immune dysfunctions.

2.2.2.5 Effective pain relief

Sinha, Munikrishnan, Montgomery and Mitchell (2007:374-378), conducted a study in Torbay Hospital in the United Kingdom to assess the impact of opioid patient-controlled analgesia on laparoscopic cholecystectomy as a postoperative analgesia. The results denoted day-case laparoscopy as safe and feasible although patient-controlled analgesia on laparoscopic cholecystectomy as a post-operative analgesia was questionable. Patient-controlled analgesia is defined as a drug delivery system that gives the patient a preset intravascular dose of narcotic analgesic when he or she pushes a switch and if the patient tries to increase the amount of narcotic delivery a lockout interval automatically inactivates the system to prevent over dosage of the drug (Mosby’s Dictionary of Medicine, Nursing and Health Professions 2006:1412).

According to Kim, Kang, Hong, Park, Baek, Kim, Jung and Kim (2011:3183-3190), intravenous lidocaine injection is just as effective as intraperitoneal instillation of lidocaine in patients undergoing laparoscopic surgery and since intravenous lidocaine injection is as effective as the intraperitoneal route and the intravenous route is universally applicable, it was more acceptable.

2.2.2.6 Early detection of malignancies

Early detection of gall bladder cancer through laparoscopy has brought about an increased chance of survival and lowered the threshold for symptomatic patients with gall bladder disease according to research done by Shih, Schulick, Cameron, Lillemore, Pitt, Choti, Campbell, Yeo and Talamini (2007:893-901). Laparoscopy is now
considered an effective tool for diagnosis and staging of malignancies, especially when combined with laparoscopic ultrasonography. Laparoscopic evaluation of the abdomen can be performed in as little as 10-15 minutes, and such evaluation eliminates the need for laparotomy in many patients (Bhattacharya 2004:22-23).

2.2.2.7 Reduced infections

Laparoscopic surgery offers many advantages including reduction of overall trauma to the skin and muscles, and reduced infection rate due to delicate tissues not being exposed to the air in the operating room over long periods of time (Freedman 2013). Reduced infection rate was reported in a study which was done on the effects of laparoscopic cholecystectomy, hysterectomy and appendectomy on nosocomial infections. It was found that laparoscopic cholecystectomy and hysterectomy when compared to open surgery reduced the overall odds of acquiring nosocomial infections from all sources by 50% and readmission with the nosocomial infections. With appendectomy, there was no difference between open and laparoscopic surgery regarding nosocomial infection (Brill, Ghosh, Gunnarsson, Rizzo, Fullum, Maxey & Brossette 2008:1112-1118). Less potential for surgical site infections and reduced infection rates as a result of minimal invasion techniques used during laparoscopic surgery, have been affirmed by Rothrock (2007:318).

2.2.3 Disadvantages of laparoscopic surgery

Though there are many advantages of laparoscopic surgery there are also disadvantages. The disadvantages of laparoscopic surgery relate to patient associated factors, the high cost of instrumentation and the additional training required to perform successful laparoscopic procedures.

Zinner and Ashley (2007:1099) point out that it is difficult to remove a large specimen laparoscopically because of the size of the sheath. The surgeon needs to be familiar with a new set of techniques and instruments and know when to apply them and when to convert to an open operation. Severe obesity can pose a challenge because of surgeon fatigue and reduced surgical dexterity. The distance from the insufflated abdominal wall to the abdominal organs makes the laparoscopic surgery a “far reach”.

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Another disadvantage is the need for additional training for the surgeons to perform surgery laparoscopically. Bailey, Lintott, and Grogono (2003:321-323), conducted research in the Oxford region and discovered that 73% of trainees performed laparoscopic cholecystectomies and in the United States of America the number increased from 37% to 93%. Thus, it can be deduced that after an initial learning period for the consultant trainees, laparoscopic training has been rapidly adopted and is now a major training operation. Siribaddana (2010) asserts that skills acquired by surgeons during their training would have to be enhanced when doing laparoscopic techniques for surgical procedures.

A study conducted by Jansen and Kolkman (2008:261-264) on the implementation difficulties of advanced techniques in gynaecological laparoscopy showed that laparoscopic surgery is important but complex especially in advanced procedures. The difficulties in implementation are multifactorial but the training for laparoscopic surgery is one of the major issues and the adequate training of residents and gynaecologists is essential for its safe and optimal implementation. Kolkman, Engels, Jansen and Smeets (2007:1-7) found that mentor traineeship in gynaecology enhanced the advanced laparoscopic case load. There was an increase in advanced procedures with no increase in conversion rate and patients were not exposed to increased complications and prolonged operating times.

Medina (2005:113-121) alludes that difficulty in placing a square knot by means of the laparoscopic intracorporeal technique is not just the result of poor instrumentation, improper port placement or the limitation of a two dimensional video image but can be attributed to the mixing up of the different square knot tying techniques during random practice exercises due to surgeon ignorance.

Park, Witzke and Donnelly (2002:501-509) report in their study that American surgical residency programs did not meet the suggested minimally invasive surgical case range or volume required for competency. Residency programs therefore need to be restructured to incorporate sufficient exposure for minimally invasive procedures and more expert faculty must be recruited to train residents to meet the increasing demand for laparoscopic surgery.
Although laparoscopic surgery forms an integral component of modern surgical practice, the perception exists that laparoscopic surgery in South Africa has been unplanned and under resourced. A study conducted by Apostolou and Panieri (2007:86-90) set out to assess the opinion of surgeons and surgical trainees with regard to the various facets of laparoscopic surgical training. A questionnaire was completed by 122 respondents of which 77 were trainees and 45 consultants. The majority agreed that laparoscopic surgery is essential for local surgical registrars. Current laparoscopic training was rated as average. Cholecystectomy, diagnostic laparoscopy, anti-reflux surgery and appendicetomy were deemed most important in training and the number of surgeries that needed to be done effectively totaled a mere 24. The major hurdle was lack of equipment and equipment shortages. The majority of the respondents also felt that laparoscopic skills, facilities and laparoscopic seminars would augment training. It was concluded that surgeons and trainees in academic hospitals do recognise the importance of laparoscopic training but feel that it is currently not optimal.

Bittner (2006:1190-1203) criticises the expensiveness of laparoscopic surgery, although he acknowledges that less complications occur and hospitalisation is shorter. Champault, Vons, Dagher, Amerlinck and Franco (2002:1602-1607) contend that the high cost of the instrumentation used during laparoscopic surgery may be decreased by using simple measures whilst maintaining good results.

Satava (1999:1197-1202) concedes that although laparoscopic and endoscopic procedures have been a major turning point in surgery, physical challenges have been imposed which involve the loss of the natural and intuitive ability to perform surgery. The surgeon does not look at the patient anatomy directly but rather at a video monitor that is two dimensional resulting in almost no sense of touch.

In the light of the above discussion it is clear that the advantages of laparoscopic surgery outweigh the disadvantages although caution must be applied with regard to specific patient related conditions as discussed under intra-operative complications.

2.3 PRE-OPERATIVE PHASE

The pre-operative phase begins when the decision to proceed with the surgical intervention being made and ends with the transfer of the patient onto the OR table.
(Phillips 2007:28). The nursing activities at this time involves establishing a baseline evaluation of the patient before surgery by carrying out a pre-operative interview which includes a physical and emotional assessment, previous anesthetic and medical history and identification of known allergies or genetic issues that may affect the surgical outcome. The nurse needs to ascertain if the patient is going home on the same day, whether he/she has transport and if an accompanying adult is present (Smeltzer 2007:481-482).

The nurse must educate the patient on what to expect during the intra- and the post-operative phases. The discussion should include mentioning intravenous lines, arterial lines, sequential compression devices, an indwelling urinary drainage catheter and other relevant issues. The nurse should also provide reassurance to the patients, encourage questions and remain with the patient during the induction of anaesthesia (Pallotta, Kufour & Munver 2010:22-29).

2.3.1 Pre-operative patient education

All patients have the right to receive accurate, easily understood information to enable them to participate in decisions pertaining to their health. Failure to teach and record accurate information has become the basis of malpractice litigation involving nurses. The goals of patient teaching are to provide information and to improve knowledge as well as communicate with family and colleagues to enable learning although coercion must not be used (Rothrock 2007:271). According to Wilmore, Sawyer and Kehlet (2001:473-474), educating the patient about perioperative care before the operation reduces the need for pain relief and can include relaxation techniques which can be used after the operation. This reduces anxiety and therefore resulting in a better outcome health care for the patient.

Pre-operative patient education benefits both the patient and the family. Benefits of education for the patient include a speedy recovery, relief of anxiety and an increase of self-esteem through increased self-efficacy, reduced hospitalisation costs, prevention of complaints about care and decreased amount of perceived immediate and residual pain. Benefits of education for the family and support systems include alleviation of anxiety and fear, reduction of cost, hastening of the family to its normal functioning, increasing self-esteem and developing support for the care givers efforts. Benefits of
education to the nurse include saving time, making the job easier, reduce stress levels and increases self-esteem. Benefits of education to the institution include increased patient and family satisfaction, decreased length of hospital stay and fewer re-hospitalisations (Rothrock 2007:273)

It is important to note that when to teach has more to do with the patient’s readiness to learn rather than the number of weeks, days or hours before a surgical procedure. During the assessment phase the collection of accurate assessment data about what the patient needs to know and their level of readiness to learn helps the perioperative nurse in setting realistic goals. Patients’ needs are not the same and all patients do not desire to know everything. Patients need to know enough to be able to grant consent for an invasive procedure and this facilitates intra-operative cooperation and the provision of self-care at home. Giving off highly technical information may confuse the patient who is already anxious, and therefore it should be guarded against unless specifically asked for (Rothrock 2007:274).

According to London (2012), there are several steps for effective patient education. One needs to make sure that the patients are ready to learn and respect the knowledge that they have and it is important to pay attention to what the patient requires. The nurse needs to go with the flow and the learner determines the subject to be taught. The nurse needs to focus on behaviours and skills rather than general information and check what the patient already knows because it will make new information easier to interpret. The overcoming of learning barriers warrants dealing with learner issues first and teach what is immediately necessary and provide it in writing with resources for referral. Readiness to learn must be stimulated by making patients aware what potential problems may occur and how to deal with them.

Factors that influence readiness to learn are comfort, the amount of energy currently available to the learner, motivation, the patient’s capability to learn new knowledge. According to Rumbold (1989:87), it is unjust to allow patients to receive insufficient information because this will result in the patient’s dignity being disregarded and the marginal independence their illness allow, will also be taken away. It is important for the patient to retain his or her autonomy and be active participants in their own treatment which should be promoted by sensitive communication. Although the decision whether or not to inform the patient rests with the doctor the nurse also plays a vital role
because she is continuously with the patient. The decision to withhold information must be taken with extreme care and responsibility. The nurse on one hand may want to protect the patient’s autonomy and right to know whilst she/he may want to protect the patient from bad news which may shock and harm the patient (Pera & Van Tonder 2011:154).

The provision of psycho-educational care is one of the main pre-operative nursing issues in modern day surgery, especially following laparoscopic surgery. Due to the fact that the majority day care patients are anxious, a desired level of information should be provided to patients before the day of the surgery. The reduced rate of time in hospital requires additional interventions and adequate information to patients to enhance patient self-control. Self-efficacy needs to be enhanced by giving patients positive encouragement, assistance with cognitive coping strategies aided by being positive with the patient. Another intervention would be to reduce the negative impact of the clinical environment and encourage implicit and explicit messages of safety (Mitchell 2007:37).

2.3.2 Informed consent

Health care is recognised as a right and not a privilege and therefore patients are entitled to certain rights. The nurse’s obligation to accountability and her responsibility to patient advocacy have relevance to informed consent. A patient advocate recognises the patient’s and the family’s need for information and assistance in coping with the surgical experience regardless of the setting and whether the procedure is minor to the patient. The patient senses some relief in knowing that the nurse has taken time to identify her/his needs. Accountability on the other hand means answering to someone for an obligatory action. Nurses are accountable to patients receiving services, the employer, the educational institution, the nursing profession, self and other team members (Phillips 2007:17-18).

The role of the nurse as a patient advocate according to Pera and Van Tonder (2011:86), includes informing the patient of their rights and to ensure that they have the necessary knowledge to make an informed decision and for this to be possible, the nurse needs to be sufficiently knowledgeable. Patients have to be supported in whatever decisions they make and must be safeguarded against abuse and violation of their rights. Before any surgical procedure, the professional nurse in the ward and in the
operating theatre must check and confirm the signature of the patient and ensure that
the patient is fully aware of what is going to happen to her/him in the operating theatre.
Searle, Human and Mogotlane (2011:338) emphasise that nurses should not endeavor
to explain the nature and extent of the operations to the patient because that is the
function of the doctor although the nurse witnesses the consent taking.

Bhattacharya (2004:22-23) defines consent for an operation as a document that usually
requires an explanation of the indications, principles and risk of the procedure, as well
as the consequences of not undergoing the proposed surgery and the discussion of
alternative treatments. Winslow and Olson as cited by Jones and Soper (2004:11),
agree that like all surgical procedures, preparation of the patient begins with an
informed consent where the patient fully understands the potential benefits, risks and
alternatives to the proposed laparoscopic surgery and the possibility of conversion to
open surgery. Informed consent is a process where the procedure, risks, benefits and
alternative therapy are explained verbally to the patient at the level of the patient’s
understanding. A surgeon or anaesthesia provider may be held liable for negligence if
the patient can prove that important information that could have influenced his/her
decision was withheld.

Access to health care is recognised as a right and not a privilege of every human being.
No procedure is minor to the patient and each patient reacts differently acknowledging
that the caregiver instills relief in the patient including imparting factual information
about procedures to the patient so that informed decisions are made (Phillips 2007:44).
The use of audiovisual materials to supplement the discussion including having it in
multiple languages with the assistance of an interpreter, may improve the consent
process and no coercion must be used (Smeltzer 2007:485). If there is a possibility of a
proposed laparoscopic surgery being converted to open surgery, the consent must
make provision for this.

In a study conducted by Bhattacharya (2004:22-23), questionnaires were posted to 207
surgeons requesting them to estimate how often they mentioned the nine given
complications (bile duct injury, retained calculi, port site hernia, shoulder tip pain,
conversion to open cholecystectomy, wound infection, respiratory complications,
thromboembolic complications and death), to patients when obtaining consent for
laparoscopic cholecystectomy. It was discovered that on an average, only 3 of the 9
complications were mentioned to the patients more than 50% of the time. Twenty-five percent of surgeons never discussed bile duct injury with patients and 22% mentioned it only rarely. Fifty-nine percent rarely or never informed the patient of the risk of retained calculi, 30% never mentioned shoulder tip pain, 70% never mentioned port site hernia and 90% never or rarely mentioned operative mortality. The study confirms that patients need to be better informed before undergoing minimally invasive procedures, particularly about potential risks. It was noted that most surgeons did not provide written information to the patient about the procedure and the fact that it could be changed to open surgery.

McManus and Wheatley (2003:79-82) conducted a study involving general surgeons in the West Midlands and the United Kingdom (Members of the association of endoscopic surgeons of Great Britain) and Ireland. These surgeons were asked to comment and estimate how often they discussed particular complications with their patients preoperatively. Conversion to open cholecystectomy was the most frequently explained complication. It was also found that variations existed in the frequency that individual surgeons discussed certain complications particularly the risk of bile duct injury. There was a lack of consensus from surgeons as to which risks were significant for this operation.

2.4 INTRA-OPERATIVE PHASE

This phase begins when the patient is transferred onto the operating room table and ends when he or she is admitted to the post-anaesthesia unit. The endoscopic team must be well trained for laparoscopic surgeries. The scope of nursing activities includes providing for patients safety, maintaining an aseptic environment, ensuring proper functioning of equipment, providing the surgeon with specific instruments and supplies for the surgical field and completing appropriate documentation (Phillips 2007:28).

2.4.1 Required attributes of the endoscopic team

Performing laparoscopic surgery requires manual skill, concentration and coordination of the hand and brain and the surgeon needs to have an expert knowledge of anatomy and physiology because the land marks can look distorted through an endoscope (Rothrock 2007:648). The circulating nurse as well as the scrub nurse need to have a
basic knowledge of video imaging and a good knowledge of the basic principles of laparoscopic surgery and the instrumentation so that they can anticipate problems and preempt the surgeon’s requests (Kathouda1998:1). Rothrock (2007:648) affirms that the theatre nurse needs to know the laparoscopic instruments.

Strict attention to detail about the intricacies of instrumentation and awareness of the steps in the surgical process is of the utmost importance because the team members complement each other within their own scope of practice and should anticipate each other’s needs. Working from a monitor screen as compared to direct vision is difficult and therefore expert knowledge of anatomy and physiology and manual dexterity of the surgeon is critical in all phases of the procedure. Eye hand co-ordination is essential for specimen capture and tissue suturing.

Being a relatively new concept, intense training is required to be given to the surgical team involved in laparoscopic procedures. The results of a study reported by Hamad, Brown, Clavijo and Julio (2007:110-114), showed that post-operative video debriefing is an effective educational tool for reducing adverse events during a complex laparoscopic procedure. According to Bhattacharya (2004:22-23), in all laparoscopic surgeries, the use of disposable instruments is mandatory but due to them being very expensive developing countries such as India may be forced to reuse these instruments until they ‘wear out’. A study in the United States hospitals where more than 466 laparoscopic cholecystectomies were performed showed that the logistics of reuse or its costs and risks were not known and that the reusable laparoscopic instruments were sterilised every time. It is the duty of the theatre nurse to ensure that all instruments are cleaned properly and sterilised for reuse.

2.4.2 Patient positioning

There are two types of setups, namely, the American position and the French Position. The American position is when the surgeon stands on the left side of the patient facing a monitor, with a camera assistant on the left side of the patient and the first assistant opposite the surgeon on the right side of the patient. The scrub technician/nurse stands on the right of the first assistant opposite the surgeon so that instruments may be handed over appropriately.
The French position is when the patient is positioned in a modified Lloyd Davis position with the legs spread with the surgeon standing between the legs. The monitors are on each side of the head of the patient, the camera assistant at the surgeon’s right and the first assistant at the left. The scrub technician/nurse stands at the right side of the surgeon next to the camera assistant (Kathouda1998:5). The operating room should ideally be large to accommodate three sections namely, the anesthesiologist with his/her instrumentation, the patient and the TV monitors and the third section for the instrumentation of the scrub nurse.

Gravity is relied upon for the retraction of abdominal contents to provide exposure. Care must be taken to prevent nerve complications or neuropathies. The arm of the patient should not be extended greater than 90 degrees at the shoulder. When using reverse Trendelenberg position footplates are placed at the feet which prevents sliding on the table and discomfort to the patient. The ankles are secured so that they do not twist during the procedure (Zinner & Ashley 2007:1099).

2.4.3 Laparoscopic procedure

Trocars and cannulas provide a mechanism for inserting and removing instrumentation while endoscopic surgery is performed. A sheath/cannula is inserted to access the operative site by using the trocar as an obturator. When the port of entry has been made, the trocar is removed leaving the cannula insitu. Trocars and cannulas may either be disposable or reuseable (Rothrock 2007:187). Dissecting instruments are used to cut, divide or separate tissue and they can be either straight or curved. Clamping instruments e.g. graspers, forceps and biopsy forceps are used to grasp and hold tissue or other material. Ratchets are used in the design of a grasping forceps. According to Rothrock (2007:186), graspers and forceps can be a traumatic (smooth serrated jaw surface) or traumatic (sharp teeth). Suturing may be performed either intracorporeally or extracorporeally. Extracorporeal repair means repairing the surgical tissue outside the body whilst intracorporeal means inside the body (Rothrock 2007:318).

The suction component of the irrigation is very important and the suction pipe is almost always connected to the central facility on the operating room wall and if it is too strong it will suck away the pneumoperitoneum (Carbon Dioxide [CO₂]) immediately obscuring the view and compromising the outcome and therefore it should deliver appropriate
irrigation at variable rates and be adjustable. The tip of the suction cannula is usually very sharp and can traumatisé tissues or vessels and should thus be handled carefully (Kathouda1998:17). Instrumentation is mandatory in laparoscopic surgery necessitating vigorous and intense checking by the theatre nurse prior to surgery.

An initial entry is made in the peri-umbilical region by either puncturing the skin percutaneously with an insufflation (veress) needle (closed technique) or a sharp trocar in the sheath (direct technique). A Hasson technique may be used where a small incision is made in the skin and through the fascia with a no.15 blade followed by the introduction of the trocar into the peritoneal cavity. In the direct optical technique, an optical trocar is inserted to visualise trocar placement before insufflation. An intra-abdominal pressure of 12-15 mmHg is achieved by the insufflation of 3-4 litres of CO₂ into the peritoneal cavity causing a pneumo-peritoneum. The needle is removed and replaced with a 10 mm or 11 mm trocar. The rigid telescope with the camera head are inserted into this port for visualisation. Two to six other ports may be made to facilitate the entry of other instruments e.g. dissector grasper and endoshears as in the case of laparoscopic cholecystectomy. After surgical exploration, dissection, resection, anastomosis and irrigation the CO₂ delivery is stopped and all the ports sutured with non-absorbable suture and small dressings applied (Rothrock 2007:318).

According to Al-Azawi, Houssein, Rayis and Hehir (2007), when comparing 3-port to the 4-port Laparoscopic Cholecystectomy it was found that the 3-port was safe in both acute and chronic cholecystitis and offered more advantages over the traditional 4-port insertion. The analgesic requirements including the hospital stay was reduced, there were fewer scars and it was more cost effective. Despite these advantages it is recommended that only surgeons experienced in laparoscopic techniques should be allowed to use the 3-port insertion.

2.4.4 Considerations for patient safety

In order to prevent cross contamination of the patient and the insufflator during CO₂ insufflation, the perioperative nurse (a nurse who cares for patients before, during and after operations), needs to firstly verify that the cylinder is medical grade CO₂ prior to surgery and then note the level of the gas in the cylinder. The insufflator and tubing should be flushed with CO₂ before attaching it to the patient and a disposable
hydrophobic filter should be used on insufflation and discarded after the procedure. Rothrock (2007:204) emphasises the need for a second cylinder to be available at all times. The insufflator should always be elevated above the patient to prevent fluid backflow which according to Phillips (2007:643), may allow contamination of the insufflation machine causing cross contamination between patients.

Power sources and lights need to be tested before each case and after cleaning. The projection lamp of a fiber optic illuminator generates heat which is dissipated and therefore it should not be enclosed in drapes because it can cause a fire. Sheaths need to be checked for nicks before insertion into the abdomen because it can cause injury to the tissue or the mucous membrane lining the orifice. Ideally, the metal endoscopes should be individually wrapped to prevent surface scratches from contact with other instruments and gloves need to be used when handling these instruments (Phillips 2007:651-652). It is the theatre nurses' responsibility to be knowledgeable about these aspects to maintain patient safety and they need to be mentored by senior theatre nurses in this regard.

2.4.5 Intra-operative complications

Intra-operative complications which may occur during laparoscopic surgery are mainly related to anesthesia, pneumoperitoneum and instrumentation.

2.4.5.1 Complications related to anaesthesia

Sinha, Gurwara and Gupta (2008:133-138) affirmed that laparoscopic surgery done with patient under spinal anaesthesia has several advantages when compared to laparoscopic surgery done under general anaesthesia in that patients that were converted from having spinal anaesthesia to general anaesthesia presented with hypotension, neck and shoulder pain and vomiting. Pratsas, Georgopoulou, Bareka, Leopoulos, Flossos and Vretzakis (2010) on the other hand indicated that laparoscopic procedures of the abdominal cavity necessitated endotracheal intubation and mechanical ventilation due to the induction of pneumoperitoneum. However, they agreed that due to limited studies showing the feasibility of the application of regional anaesthesia on healthy subjects there was a need for the strong indication of general anaesthesia for patients undergoing laparoscopic surgery.
2.4.5.2 Complications related to pneumoperitoneum

Complications which are related to pneumoperitoneum include peritoneal insufflation, cardiovascular effects, pulmonary effects and gas embolism.

Peritoneal insufflation

In 0.5% of cases subcutaneous and properitoneal insufflation occurs due to incorrect positioning of the veress needle or cannula or leakage of CO₂ around the trocars and therefore CO₂ accumulates in the subcutaneous tissue or between the fascia and the peritoneum and malposition occurs and it is difficult to create a pneumoperitoneum.

Jones and Soper (2004:88) highlight that an open insertion technique yields lesser complications because the trocar is placed under direct visualisation as compared to the closed technique where correct placement of the veress needle is essential. A 10ml syringe is attached to the veress needle and aspirated and if there is fluid in the syringe, it denotes placement of the needle into a viscus or a vascular structure and if no fluid aspirated saline is injected and if it is correctly placed, then the solution should flow easily into the abdomen and when aspirated no fluid should be present in the syringe (Rothrock 2007:203). If the veress needle is in the preperitoneal space or in the muscle fibre or above the rectus sheath, the injected saline can be aspirated back and when more fluid comes out, ascites, a cyst or a perforation of the bladder is suspected. If any faecal matter is noticed on aspiration then bladder injury is suspected and if blood is aspirated, blood vessel injury is suspected. If this happens the surgeon should not remove the veress needle and immediately convert to laparotomy. The reason for keeping the veress needle insitu is because it is easy to find the punctured area after the laparotomy and the blood loss will be less (Mishra 2012).

Cardio vascular effects

Cardiovascular changes occurring during laparoscopic procedures are due to the mechanical and chemical effects of carbon dioxide induced pneumoperitoneum. The mechanical effect of pneumoperitoneum is the compression of the inferior vena cavae which causes reduction to venous return resulting in decreased cardiac output and increased central venous pressure with increased vascular resistance in the arterial
circulation. These effects can be managed by infusing adequate fluid intra-operatively. Pulmonary effects include the displacement of the diaphragm by the pneumoperitoneum which can decrease total lung capacity and functional residual capacity and cause carbon dioxide retention and atelectasis (collapse of the alveoli). The Trendellenberg position can worsen this displacement causing pooling of blood in dependent portions of the lung (Srivastava & Niranjan 2010:91-94).

Cardiovascular effects which may result from pneumoperitoneum include ventricular arrhythmias which are caused by hypercarbia (greater than normal amounts of carbon dioxide in the blood) and acidosis as a result of peritoneal absorption of CO₂. Careful monitoring of the patients ventilation and oxygenation is important during the surgery and the treatment is to desufflate the abdomen for 10 to 15 minutes and if reinsufflation results in recurrent hypercapnia there should be a change of insufflation gases or the surgeon should convert to open surgery (Jones & Soper 2004:89).

The pressure within the abdomen from pneumoperitoneum decreases venous return by collapsing the intra-abdominal veins, especially in volume depleted patients. Decrease venous return may lead to decreased cardiac output. To compensate there is an elevation in the heart rate, which increases myocardial oxygen demand and therefore high-risk cardiopulmonary patients cannot always meet the demand and may not tolerate a laparoscopic procedure (Jones & Soper 2004:89).

Perrin and Fletcher (2004:107-110) caution that the raised intra-abdominal pressure of the pneumoperitoneum, alteration in the patients position and the effects of carbon dioxide absorbed, causes changes in the physiology especially within the cardiovascular and respiratory systems which in turn may have significant effects on elderly patients and patients that have associated morbidity.

To minimise the cardiovascular effects of pneumoperitoneum, patients should be adequately hydrated pre-operatively. Holte, Klarskou, Christensen, Lund, Nielsen, Bie and Kehlet (2004:892-899) conducted a study to investigate the effects of two levels of fluid administration (Lactated Ringers) and the results showed that intra-operative administration of 40 ml/kg of Lactated Ringers Solution as compared to 15 ml/kg of Lactated Ringers Solution improved post-operative organ function and recovery and
shortened hospital stay after laparoscopic cholecystectomy emphasising the importance of fluid administration intra-operatively.

There may be increased incidence of *deep vein thrombosis* after laparoscopic surgery due to pooling of blood in the venous system of the lower extremities. Venous return is impaired by the compression of the iliac veins from elevated intra-abdominal pressure exerted by the pneumoperitoneum. Reverse Trendelenberg position which is necessary in laparoscopic surgery leads to further distension of the venous system and therefore compression devices need to be placed before the procedure and high risk patients should be treated with subcutaneous anticoagulants like heparin (LeBlanc 2004:53). The ward nurses need to be aware of this and take measures to prevent it by educating the patients on the use of anti-embolic stockings, leg exercises and to observe the patient for the clinical signs of deep vein thrombosis, swelling, pain, erythemia and discoloration (Geraghty 2001:34).

*Carbon dioxide embolus*

Signs of CO₂ embolus include decreased blood pressure, dysrhythmia, heart murmurs, cyanosis, pulmonary edema and an abrupt increase in end tidal CO₂. If an embolus is suspected vigilant monitoring is necessary. The pneumoperitoneum must be deflated and the patient turned to the left lateral position. Aspiration of CO₂ gas can be done via a central venous catheter (Rothrock 2007:204). Zinner and Ashley (2007:1109) explain that CO₂ embolism may be suspected if the patient has unexplained hypotension and hypoxia during the operation. The management of this patient would be to discontinue insufflation with the release of pneumoperitoneum. The patient is thereafter ventilated with 100% oxygen to wash out carbon dioxide and improve ventilation perfusion mismatch and hypoxaemia. The patient should be in a steep head down, left lateral decubitus position or Trendelenberg position to allow gas bubbles to rise to the apex of the right atrium and to prevent entry into the pulmonary artery. Vital signs should be continuously assessed and support measures and cardiopulmonary resuscitation initiated as necessary to maintain oxygenation of vital organs (Park, Kwon & Kim 2012:459-466).
Capnothorax /pneumothorax

Capnothorax can be caused by carbon dioxide escaping into the chest through a defect in the diaphragm or tracking through fascial planes during dissection of the esophageal hiatus. Pleural tears during fundoplication can lead to pneumothorax which according to Mosby’s Dictionary of Medicine, Nursing and Health Professions (2006:1480), is the presence of gas or air in the pleural space causing the lung to collapse. The effects of carbon dioxide gas in the chest are usually detected by decreased oxygen saturation due to shunting induced by lung collapse, increased airway pressure, decreased pulmonary compliance and increases in CO₂. The treatment is to desufflate the abdomen and stop carbon dioxide administration, correct the hypoxaemia by adjusting the ventilator, apply positive end-expiratory pressure and decrease intra-abdominal pressure (Zinner & Ashley 2007:1109-1110).

According to Castillo, Vitagliano, Moreno, Diaz and Cortes (2007:328-329), carbon dioxide pneumothorax is a rare complication in laparoscopic urology but with the widespread use of laparoscopy and the increasing surgical pathologies managed by this technique, this infrequent complication has become a risk.

2.4.5.3 Complications related to instrumentation – trocar and veress needle injuries

Several studies indicate that the initial trocar insertion is probably the most dangerous step in minimally invasive surgery. In 1996, it was found that 83% of vascular injuries, 75% of bowel injuries and 50% of local injuries were caused during primary trocar insertion. It was noted that the major vessel injuries were almost always due to the operator (surgeon) and that delayed recognition of injuries in patients older than 59 years were significantly associated with fatal outcomes. It was also evident that the surgeon’s experience had the greatest effect on the rate of vascular injuries and a lesser on visceral injuries (Fuller, Scott, Ashar & Corrado 2003).

Trocar and veress needle injuries are rare, but if it happens it is potentially dangerous and therefore an alternative like an optical trocar under direct vision was looked into and it was found that optical access trocars provide a safe and rapid technique for initial trocar placement (Mathew, Thomas, Rha, Ong, Pinto, Montogomery & Thomas
A study was carried out where three types of injuries are mentioned of which 408 were major blood vessels, 182 other visceral injuries (mainly bowel injuries) and thirty abdominal wall haemotomas. Of the 32 deaths that occurred 26 (81%) resulted from vascular injuries and six (19%) resulted from bowel injuries. Whereas 87% of deaths from vascular injuries involved the use of disposable trocars with safety shields, only 9% involved trocars with a direct viewing feature. It was discovered that 91% of the bowel injuries involved trocars with safety shields and 9% involved direct viewing trocars and therefore safety shields and direct view trocars cannot prevent serious injuries.

The overall risk of a trocar injury to intra-abdominal structures is between 5 in 10,000 and 3 in 1,000. Almost all injuries occur during primary insertion. Bowel injuries often go unrecognised in which case they are highly lethal (Bhoyrul, Vierra, Nezhat, Krummel & Way 2001:677-683). According to Zinner and Ashley (2007:1104), the most commonly injured organs are the small bowel (24.5%), iliac artery (18.5%), colon (12.2%), mesenteric vessels (7.3%) and aorta (6.4%). Major vascular injuries are noticed immediately and rapid conversion to laparotomy is done.

Schafer, Lauper and Krahenbahl (2001:275-280) collected data on 14,243 patients undergoing laparoscopic procedures between 1995-1997. This study confirmed that trocar and needle injuries were rare complications but if not repaired immediately they could cause morbidity and mortality. They recommended that the first trocar be inserted under direct vision which allows for easy recognition and immediate repair.

Vascular injuries

The aortic bifurcation lies below the umbilicus and therefore the vena cava and the iliac vessels are susceptible to injury and these injuries occur usually when the closed insertion technique is used. This type of injury is noticed when aspirating by a syringe through the veress needle and the immediate action would be to open the abdomen because the mortality rate is 8-13% (Jones & Soper 2004:90). Gas embolism can also occur as a result of the veress needle being placed into a major vessel and insufflated with carbon dioxide. Jones and Soper (2004:89) add that in order for gas embolism to occur, a substantial amount of CO₂ must enter the vein at a rapid rate (greater than 1 litre per minute).
Bowel injuries

According to Jones and Soper (2004:90), bowel injuries are caused by veress needle puncture and require no repair except for trocar injuries. The appearance of bowel contents seen coming through the trocar is indicative of trocar injuries and this needs immediate repair. Patients reporting with previous abdominal surgery, metastatic disease and abdominal distention are at risk for bowel injury and therefore an open insertion technique for laparoscopic surgery is the safest approach. The nurse taking the patient’s history must be aware of these contra-indications to enable her to witness adequately informed consent when the patient signs for permission for a surgical procedure.

Malik, Laghari, Mallah, Hashmi, Sheik and Talpur (2008:5-8) concluded after doing a retrospective study on patients having laparoscopic cholecystectomy that extra-biliary complications such as duodenal and colonic perforations occurred as frequently as the biliary complications and can be life threatening and therefore an early diagnosis is critical.

Solid organ injury

Solid organ injury can be suspected if the insufflation pressures are high and blood or blood tinged saline solution is aspirated. This is rare because the initial Veress and trocar are inserted at a midline umbilical site and the subsequent trocars are placed under direct laparoscopic vision (Jones & Soper 2004:91). A study was conducted by Demetriades, Hadjizacharia, Constantinou, Brown, Inaba, Rhee and Salim (2006:620-628) to assess the feasibility of selective non operative management in penetrating abdominal solid organ injury. The results denoted that patients that were treated non-operatively had a significantly shorter hospital stay than those treated operatively and therefore non-operative management of patients with penetrating abdominal solid organ injuries had a high success rate with less complications. According to a learning package created by Arndt, Bong, Ehman and Roach (2009:8), monitoring of vital signs and urinary output is mandatory. Intravenous fluids need to be given and blood tests must be done especially for haemoglobin content. Such a patient is nursed on strict bed rest and ambulated under supervision. The patient is only discharged when the blood pressure and the pulse is within normal limits and he/she is ambulant.
2.4.5.4 Nerve damage

Brachial plexus injuries are the most common and is due to improper positioning especially if the patient is put in the Trendellenberg position or if the arms are adducted beyond 90 degrees (Jones & Soper 2004:91). Proper positioning and padding of pressure points at the beginning of the procedure is very important to prevent perineal nerve injury, which is caused by lateral pressure at the knee and may occur when the table is airplaned to the side with a retractor holding the patient in place (Zinner & Ashley 2007:1106). The responsibility of the theatre nurse is to position the patient properly paying special attention to potential nerve injuries that result from compression or stretching.

2.4.5.5 Thermal injuries

Thermal damage to viscera and abdominal vessels may be caused by electrocautery and lasers and the extent of injury depends on the type of current e.g. with bipolar current, the injury is limited to the tissue that lies between the forceps whereas in the case of monopolar, injuries may be more extensive (Jones & Soper 2004:91). A bipolar current is recommended for coagulation purposes. If the tissue is touched by a higher current the effect will result in deep tissue necrosis (Philosphe 2003:30-39).

2.5 POST-OPERATIVE PHASE

This phase begins with the admission of the patient to the post-anaesthetic care unit (PACU) and ends up with the follow-up evaluation in the clinical setting or at home.

2.5.1 Post-anaesthetic care unit

The role of the circulating nurse (scrub nurse) is to call the post-anaesthetic care nurse before taking the patient out of the operating theatre and communicate the estimated time of arrival of the patient ensuring that the physiological and the psychological status of the patient is also reported (Phillips 2007:604-605). The focus during this period is maintaining the patients airway, monitoring vital signs, assessing the effects of anaesthetic agents, assessing the patients for complications which is usually respiratory and cardiovascular complications and providing comfort and pain relief. A study was
conducted by Kim, Jung, Koo, Lee, Woo and Im (2012:668-673) on the treatment for post-operative wound pain in gynaecological laparoscopic surgery using topical lidocaine patches. Twenty patients were given 700 mg of lidocaine patches and 20 patients received placebo patches. It was evident that the patients who received the lidocaine patches experienced less post-operative wound pain as compared to those who received placebos.

Rothrock (2007:246) contends that the initial assessment of the post-operative patient begins with determining airway and circulatory adequacy. A saturation probe is put on the patient to assess oxygen saturation and humidified oxygen is given to the patient via a T-piece or a venturi mask. The patient is thereafter put on a cardiac monitor for monitoring the pulse, respiration rate and the blood pressure and only after this procedure, is a report given to the post-anaesthetic care nurse by the anaesthetist, the surgeon and the scrub nurse. The information handed over by the anaesthetist is the patient’s detail, the type of anaesthesia given, allergies that the patient may have, any existing condition that the patient has, any changes in the patient’s vital signs intra-operatively, the patient’s intake and output including the intravenous infusion and pre-, intra- and post-operative administration of medication. The surgeon on the other hand, focuses on the post-operative orders pertaining to immediate treatment in the post-anaesthetic care unit or immediate post-operative period. Diagnostic tests and special interventions pertaining to the surgical site are carried out in the post-anaesthetic care unit and continued through to the ward.

The circulating nurse (scrub nurse) will report on base-line data, positioning and skin preparation, specialised equipment used, intra-operative irrigation fluids, administration of dyes and medications in the surgical field, types of dressings and drains, intake and output, patient’s indication of pain, any pertinent information that was left out by the anaesthetist and the surgeon, and the location of family members who may be waiting (Phillips 2007:605-607).

The most likely complications that can occur while the patient is still in the post-anaesthetic care unit for all patients undergoing surgery, are aspiration which is due to decreased throat reflexes when the patient is unconscious or conscious with the throat anaesthesised (Phillips 2007:610). Rothrock (2007:249) explains that laryngospasms and bronchospasms are a result of an irritable throat where the muscles of the larynx
contract partially or completely obstructs the airway. Bronchospasms are caused by the spasms of the bronchial tubes which cause complete closure because of the lack of cartilaginous support in the bronchioles.

2.5.2 Post-operative complications

Post-operative complications include peritonitis, delayed haemorrhage, incisional hernias, tumour metastases and azotemia. The nurse needs to know about the potential complications that patients may experience during and after surgery. A satisfactory score in one phase is not always a predictor of how the patient will do in subsequent phases.

2.5.2.1 Peritonitis

Infections in the wound are rare and may be caused by skin organisms or by bacteria that have spread from the peritoneal cavity and a post-operative fever or abdominal tenderness may be the first sign of a bowel perforation from a trocar, veress needle or thermal injury (Jones & Soper 2004:92). Bowel perforations or bile duct injuries may be recognised during the operation and repaired. There is however a risk that they can remain undiagnosed and lead to peritonitis, circulatory collapse or septic shock and therefore careful monitoring is essential (National Patient Safety Agency 2010).

2.5.2.2 Delayed hemorrhage

Ongoing blood loss from the operative field will result in a hemodynamic instability and it may be due to bleeding from a trocar site in the abdominal wall, an injured intra-abdominal vessel, or the operative field. Redeveloping abdominal pain, abdominal distention, a falling hematocrit level, tachycardia, oliguria and hemodynamic changes are symptoms indicative of hemorrhage (Jones & Soper 2004:92). A study was conducted to determine the incidence of bleeding complications from various laparoscopic procedures in a nationwide prospective multicenter in Switzerland in 1995-2001 in which 43,028 procedures were analysed and assessed. The results showed that local morbidity (wound infections) occurred in 0.05% of the whole patient group whereas 3.3% developed general post-operative complications. The overall mortality rate was 0.2% and in 1.7% of the cases, the intra-operative phase was complicated by
internal bleeding or haemotoma of the abdominal wall. In the post-operative phase 1.5% of the patients showed signs of internal bleeding. Major vascular injury occurred in 0.09%. The conclusion of the study was that the rate of bleeding complications is still substantial (Opitz, Ganert, Giger, Kocker & Krahenbuhl 2005:128-133). According to Kaushik (2010:59-65), good surgical technique, awareness and early recognition, are keys to success when dealing with bleeding.

2.5.2.3 Incisional hernia

Incisional hernias usually develop as a result of infection at a trocar site, inadequate re-approximation of the fascial edges or premature suture disruption. Trocar sites that are 10 mm or larger, have a higher risk of developing late incisional hernias and may herniate if the fascia is not closed at the end of the procedure. The prevention of the above would include closure of the fascia for any trocar site that is 10 mm or larger or the use of non-bladed or radially expanding trocars (Jones & Soper 2004:93).

Incisional hernias are less common in laparoscopic surgery because of the small incision but it is a potential risk for an ectopic pregnancy done laparoscopically. An incisional hernia develops if the abdominal wall fails to close after the trocar is removed and the potential problem is when the bowel is trapped in this defect resulting in obstruction (Schoenstadt 2006).

2.5.2.4 Tumor metastases

Malignant dissemination at a trocar site and seeding along the tracts of an instrument has been reported with primary cancers of the stomach, ovary and biliary tract. Although it is a rare complication of laparoscopy, the use of laparoscopic procedures for resections of cancers remains a controversial issue (Jones & Soper 2004:93). According to Bhattacharya (2004:22-23), the incidence of port-site metastases is an ethical issue as the smoke created by coagulation during laparoscopic surgery contains whole cells which is carried as an aerosol during pneumoperitoneum and could be a mechanism for tumor implantation elsewhere and therefore, intentional coagulation of malignant tissue should be avoided. The nurse needs to be aware of this as she has to advocate for her patients when witnessing informed consent being signed before a surgical procedure.
2.5.2.5 Azotemia

Azotemia refers to the retention of excessive amounts of nitrogenous compounds in the blood caused by the failure of the kidneys to remove urea from the blood (Mosby’s Dictionary of Medicine, Nursing and Health Professions 2006:179). An unrecognised bladder perforation may lead to azotemia especially when it is associated with ascites and hyponatremia (lower than normal sodium in the blood). Haematuria or pneumaturia (the passing of flatus with the urine owing to a vesico intestinal fistula and air from the bowel entering the bladder) can indicate bladder injury and a rising creatinine level with hyperkalemia and hyponatremia is consistent with bladder perforation and therefore it is important to empty the bladder before any instruments are placed (Jones & Soper 2004:93). Nurses have a responsibility to ensure that patients’ bladders are emptied just before scheduled surgery as a precaution to injury during surgery, especially in the case of laparoscopic surgery where the risk of injury to organs is greater because of the small visual field.

Urinary output is often diminished due to the decreased renal blood flow as a result of the cardiovascular effects of pneumoperitoneum and the direct pressure on the renal veins. In addition, the elevated intra-abdominal pressure results in the release of the antidiuretic hormone by the pituitary resulting in oliguria that may last 30 to 60 minutes after the pneumoperitoneum is released. Aggressive fluid hydration and positional changes increase urine output (Zinner & Ashley 2007:1109). Nursing management of this patient would be strict intake and output recording and fluids administered which should consist of hypotonic solutions such as 0.5% saline or 5% dextrose in water. Alert patients should be encouraged to drink as much free water as they can tolerate and if not possible it can be given via a naso-gastric tube. Electrolytes need to be checked every six to eight hours especially the sodium levels (Salifu 2012).

2.5.2.6 Hypercarbia

Excess insufflation pressure can force carbon dioxide to diffuse into the blood resulting in hypercarbia. It also increases diaphragmatic pressure which could result in regurgitation and aspiration of stomach contents. Excess insufflation reduces intra-thoracic space resulting in decreased respiratory effort and cardiac output. Carbon dioxide also irritates the phrenic nerve causing post-operative pain in the shoulder and
the neck (Rothrock 2007:203). Patients should be informed that they may experience shoulder and neck pain after laparoscopic surgery knowing what to expect may decrease anxiety levels after surgery. Rothrock (2007:203) explains that a 2 way hydrophobic filter should be incorporated in the insufflation tubing to prevent patients from harmful gas tank contamination and organisms like klebsiella, pseudomonas and staphylococcus aureus which could affect the surgical outcome in a negative way.

### 2.5.2.7 Incomplete fascial closure

Zinner and Ashley (2007:1104) state that 0.65%-2.80% of laparoscopic gastrointestinal operations result in port size hernias and this can lead to bowel obstruction, incarceration and/or Richter’s hernias. All defects created with 10 mm or greater bladed trocars should be closed unless newer non bladed trocars that create smaller fascial defects are used. Most 5 mm ports do not require fascial closure. To avoid port site hernias the smallest port should always be used. When a port is manipulated excessively or has to be changed many times the fascial defect is bigger. A study was conducted by Botea, Torzilli and Sarbu (2011:77-80) on a simple effective technique for port size closure after laparoscopy. The aim was to introduce a procedure that allowed the safe suturing of the abdominal fascia in laparoscopic surgery as this presented a challenge. A simple technique for fascial closure, the transcutaneous approach using standard surgical instruments for suturing was done on thirty four patients after laparoscopic surgery. No intra-operative incidents and port size hernias occurred to them in the experiment, underscoring the deduction that the procedure was easy to perform, safe, fast and inexpensive.

Nurses need to be aware that hernias and bowel obstructions do occur especially with a large trocar wound and that vigilance in detecting warning signs for example pain and inflammation and prompt reporting to the doctor is important to prevent further complications post-laparoscopic surgery.

### 2.5.3 Post-operative patient education

The provision of adequate levels of education for patient and care-givers will help to manage the patient’s anxiety post-operatively until discharge. The provision of suitable information to aid self-recovery once discharged and being at home is quite challenging.
Patients need to be informed of possible complications so that problems can be dealt with properly. According to Mitchell (2007:39), all surgical patients should be provided with information concerned with continued pain management, possible complications, common wound problems, bathing, activity levels, returning to work, driving and advice on sexual matters and diet. This information expedites recovery and improves the individual’s confidence in managing his or her own care.

The American Academy of Family Physicians (2012), describe the principles of patient education as ensuring that nurses adapt teaching to the patient’s level of readiness. It also takes cognisance of past experiences, cultural beliefs and understanding and to create an environment conducive to learning with trust, respect and acceptance. It is important to involve the patients throughout the educational process by encouraging them to establish their own goal and to identify the patients’ perception to health care to improve the patients’ motivation for self-management. The nurse must provide opportunities for patients to demonstrate the understanding of information and to practice skills. The Family Medicine residency program on Patient Education Curriculum (2012) explains the importance of providing patients with complete and current information which creates an atmosphere of trust and enhancement of doctor-patient and subsequent nurse-patient relationships. It is therefore mandatory for the providers of care to ascertain the needs of patients and the barriers to learning and to provide concise counseling.

2.6 CONCLUSION

Laparoscopic surgery is a fairly new approach to abdominal surgery for minimal access into the abdomen to achieve the same surgical result as open laparotomy. Minimal access surgery offers considerable advantages over more traditional open surgery due to the absence of a large abdominal incision and less post-operative discomfort is experienced although there may be muscle discomfort as a result of the manipulation of instruments and insufflation of the abdominal cavity with carbon dioxide. The disadvantages and intra-operative and post-operative complications of laparoscopic surgery and the management thereof were discussed. Nurses who care for patients who had laparoscopic surgery must be well informed about laparoscopic surgery to enable them to fulfill their caring and advocacy roles. Informed consent, advocacy and the nurse’s accountability were discussed and the importance of providing patient
education pre- and post-operatively was emphasised. The next chapter discusses the research methodology and design used in this study.
CHAPTER 3

RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

This chapter presents a discussion of the research approach, design and methodology used. The research setting, target population, sample selection, data collection instruments, validity and reliability, data collection method, data analysis and ethical considerations are discussed.

A non-experimental, quantitative design was selected using structured questionnaires to collect the data (Brink 2008:102). The purpose of this study was to establish nurses’ and patients’ knowledge and understanding of laparoscopic surgery and to determine whether nurses are sufficiently knowledgeable to disseminate adequate information about laparoscopic surgery to patients. Two state hospitals, namely, King Edward VIII and the Albert Luthuli Hospitals based in KwaZulu-Natal were used for the empirical investigation. Letters of approval (Annexure B1 and B2 and C1 and C2), were given by both the hospitals’ Management to conduct the research. Further, the researcher also obtained written approval from the Department of Health (Annexure A1 and A2) to conduct the research at these 2 hospitals.

The objectives of the study were:

- To identify operating theatre and surgical ward nurses’ knowledge and understanding of laparoscopic surgery
- To establish whether patients are adequately informed pre-operatively about laparoscopic surgery
- To determine patients’ knowledge and understanding of laparoscopic surgery

3.2 RESEARCH APPROACH AND DESIGN

According to Brink (2008:207), a research design is the overall plan for gathering data in
a research study. Polit and Beck (2008:765) define research design as the overall plan for addressing a research question, including specifications for enhancing the study’s integrity.

3.2.1 Research approach

The researcher adopted a quantitative design where structured closed-ended questions were formulated for both questionnaires. One questionnaire was administered to the Ward and Theatre Nurses (Annexure F) and another questionnaire was for the selected patients (Annexure G) using the convenience sampling technique. According to Burns and Grove (1999:16), the quantitative design is a formal objective systematic process where information is derived from numerical data with the findings grounded in reality rather than in the researcher’s personal beliefs (Polit & Beck 2008:16).

Quantitative research originates from the positivist tradition where objectivity is valued and attempts are made to hold the researcher’s personal beliefs and biases in check so as to not contaminate the phenomena under study (Polit & Beck 2008:15). When using the positivist paradigm evidence for the study is collected according to an established plan in a systematic way using structured instruments to collect information e.g. a questionnaire. This study was based on the positivist paradigm which underlies the traditional scientific approach and which assumes that there is a fixed orderly reality that can be objectively studied (Polit & Beck 2008:16).

3.2.2 Research design

A quantitative descriptive research design was chosen. Through descriptive studies the researcher was able to discover new meaning, describe what existed, determined the frequency with which something occurred and was also able to categorise information (Burns & Grove 1999:24). The researcher was able to ascertain the extent of knowledge and understanding the respondents (nurses and patients) have about laparoscopic surgery. The data collected was coded and edited to form a data set. The data was analysed with the assistance of a statistician. Polit and Beck (2008:252) define descriptive research as having as its main objective the accurate portrayal of the characteristics of persons, situations or groups, and/or the frequency with which certain phenomena occur and therefore descriptive research can be used in qualitative studies.
as well.

3.3 RESEARCH SETTING

As stated in the preamble, the research study was conducted at two Government Hospitals in KwaZulu-Natal, namely, King Edward VIII and the Albert Luthuli Hospitals based in KwaZulu-Natal. These hospitals were chosen because they were located regionally and had a component of a tertiary element. More importantly, these two hospitals were involved in laparoscopic surgeries on a daily basis. Private hospitals were also approached for this study but the researcher was denied permission to conduct this research study.

3.4 RESEARCH METHODOLOGY

Brink (2008:191) explains that research methodology involves informing the reader of how the actual investigation was carried out i.e. what the researcher did to solve the research problem or to answer the research questions and objectives. Research methodology and the type of design used thus forms the basic foundation for a sound empirical investigation.

3.4.1 Target population

A population is an entire set of individuals having common defining characteristics of interest to the researcher (Polit & Beck 2008:67). The researcher was interested in patients who were undergoing laparoscopic surgery and the nurses who had to take care of these patients. The target population comprised of ward nurses and professional nurses working in the operating theatre and in the surgical wards and patients undergoing laparoscopic surgery in the two selected government aided hospitals.

3.4.2 Sampling procedure

According to Polit and Beck (2008:339), sampling is the process of selecting a portion of the population to represent the entire population so that inferences of the population can be made. Sampling involves selecting a group of people, events, behaviors, or other elements with which to conduct a study (Burns & Grove 1999:226). The literature
highlights various probability and non-probability sampling techniques.

Given the unique nature of the study focusing on the knowledge and understanding of laparoscopic surgery by ward and theatre nurses and the patients who were scheduled for this type of surgery, the non-probability sampling technique was chosen using the convenience sampling method. Polit and Beck (2008:341) explain that convenience sampling occurs when one uses the most conveniently available persons as study respondents. This was underpinned by the fact that the respondents, i.e. the patients were chosen according to the theatre slate during the data collection period. Similarly, the professional nurses both ward and theatre nurses were chosen according to their availability and who were involved for laparoscopic procedures. Moule and Goodman (2009:272), describe convenience sampling as gathering information from those cases or people locally available. In this study, convenience sampling was justified because the most available subjects who met the sampling criteria were used (Parahoo 2006:266).

3.4.3 Sample

Polit and Beck (2008:339) define the sample as a subset of population with elements being the most basic unit from whom the information is collected i.e. the respondents. Using this strategy as a point of departure, the sample comprised of eighty seven (87) ward nurses, thirty nine (39) theatre nurses and forty two (42) patients undergoing laparoscopic surgery. Identification of the potential respondents (patients) was done through scrutiny of the theatre slates prior to surgery and these patients 40 (95.2%) were visited the day before the scheduled surgery and 2 (4.8%) a day after the operation.

3.4.3.1 Eligibility and sampling criteria

According to Burns and Grove (1999:227), in some studies sampling criteria may also be used. For this study, the sampling criteria are the characteristics essential for inclusion in the target population and these criteria were that the selected respondents (patients) should meet the following criteria:

- 18 years and older.
• Willing to participate.
• Scheduled for laparoscopic surgery.
• Of sound mind in order to consent to participation.
• Of either gender or race.
• Able to speak English as the medium of communication.

The other category of respondents (nurses) had to be:

• Professional nurses taking care of patients undergoing laparoscopic surgery preoperatively and postoperatively in the ward (surgical ward) or professional nurses who were working as scrub nurses in an operating theatre.
• 18 years and older.
• Willing to participate.
• Of sound mind in order to consent to participation.
• Of either gender or race.
• Able to speak English as the medium of communication.

3.4.4 Data collection instrument

Two questionnaires were used to collect data. One was used for the theatre nurses and ward nurses (Annexure F) and the other for patients (Annexure G). A questionnaire is a printed self-report form designed to elicit information that can be obtained through written or verbal responses of the respondents and is able to gather a broad spectrum of information from respondents (Burns & Grove 1999:272).

Parahoo (2006:283-284) describes a questionnaire as a method that seeks written or verbal responses from people to a written set of questions or statements. It is predetermined, standardised and structured. Questionnaires in descriptive studies do not only provide data that facilitate understanding of phenomena being investigated but also generate data from which concepts and hypotheses can be formulated. Data can be analysed more readily and large populations can be assessed. Questionnaires were chosen to collect information on the knowledge and understanding of patients and nurses about laparoscopic procedures.

Questions asked were mainly closed-ended where respondents had to indicate a yes or
no or choose between a few options. A few open-ended questions were also asked where written responses were required from the respondents. This allowed the researcher to gain a valuable insight which allowed respondents to answer in their own words and also in some instances substantiating the closed ended questions (Polit & Beck 2004:272). Questionnaires gave subjects more privacy and the open-ended questions made it possible for them to voice their opinion without any intimidation or undue influence from the researcher. However, although questionnaires have their advantages there are disadvantages.

According to Parahoo (2006:299), open-ended questions give the respondents little opportunity to elaborate, expand, clarify or illustrate their answers and most often than not their interpretation is different from the actual question asked.

3.4.4.1 Constructs of the questionnaire

The questionnaire for the nurses consisted of Sections A, B, C and D which were answered by the ward and theatre nurses. Section A included demographics and their knowledge about laparoscopic surgery. Section B included the preoperative phase where nurses were asked about whether patients were informed about the surgery, how safe laparoscopic surgery was, the advantages of laparoscopic surgery and the consent taken. Section C included the intraoperative phase where the nurse (respondent) was asked about scrubbing, mentoring, outcome of surgery and possible conversions to open surgery. Section D incorporated the post-operative phase. The post-operative phase included the complications of laparoscopic surgery and its severity, post-operative pain, infection rate, monitoring and issues related to the discharge of patients. The ward nurses completed Section A, B and D. The structured questionnaire for the selected patients included three sections, namely, A, B and C. Section A comprised of demographic variables, Section B focused on the preoperative phase and Section C the post-operative phase. The preoperative phase covered the knowledge and information aspect of laparoscopic surgery and how safe laparoscopic surgery is. The postoperative phase included advantages, complications, pain and injury to organs. It also included the recovery rate and resumption of daily activities on the part of the patient who underwent this surgery.
3.4.4.2 Pre-testing the questionnaire

Polit and Beck (2010:564) assert that pretesting or a pilot test is a trial administration of a newly developed instrument to identify potential weaknesses which was executed in this study.

Polit and Beck (2008:762) define pretest as a trial administration of a newly developed instrument to identify flaws or assess time requirements. A pre-testing of the questionnaire is important so as to detect flaws and be able to correct them before the actual administration of the questionnaire to the sample respondents. The researcher gave the questionnaire to 6 homogenous respondents, namely, three (3) nurses and three (3) patients who met the criteria and who were not part of the actual sample respondents. If questions warranted changes or even removal this needed to be done so as to make the questionnaire user friendly, valid and reliable. This exercise proved a valuable mechanism as there were changes made to the numbering and the stem to some open ended questions in the nurses’ questionnaire, e.g. question 44 which reads “if the answer to question 35 is yes why do you think so? This should have been worded to read: “if the answer to question 43 is all or some, why do you think so? No flaws were detected in the patients’ questionnaire and hence no refinement was necessary.

3.5 DESIGN VALIDITY

According to Burns and Grove (2001:226), design validity is the determination of whether the study provides a convincing test of the framework propositions and it provides a major basis for deciding which findings are useful for patient care.

3.5.1 Internal validity

Internal validity is defined by Brink (2008:99), as the degree to which the outcomes of an experiment can be attributed to the manipulated, independent variable rather than to uncontrolled extraneous factors. The design used in this study was a cross-sectional design which is defined by Polit and Beck (2010:239) as collection of data at one point in time or multiple times in a short time period and all phenomena under study are
captured during one data collection period. Thus, in this study there were no threats to maturation with regard to internal validity (Brink 2008:99).

The Hawthorne effect or the expectancy effect may be a threat to both external and internal validity and it occurs when subjects are aware that they are being observed and therefore respond in a certain manner (Brink 2004:107). Although it is imperative that the nurses and patients were aware that research was being carried out they needed to be assured that their responses should be frank and honest. A Letter of Informed Consent for each participant (Annexure E) was also shown with the questionnaire, assuring the respondents of their anonymity and confidentiality of the questions asked.

**The experimenter effect**

The experimenter effect is a threat to study results when researcher characteristics or behavior influence study behavior and this can be minimised by firstly gaining a good interpersonal rapport with the subject and being present when the questionnaire is being answered together with a witness. The experimenter effect was minimised because the tool used included both closed-ended and open-ended questioning (Polit & Beck 2004:219). To ensure objectivity of answering the questions, the researcher was not present. The questionnaires were handed to the nurses and collected a week later. When it came to the patients, the researcher was present during completion of the questionnaires but only to answer any ambiguities that arose. However, no problems were encountered.

**Reactive effect**

Reactive effects occur when the subjects are aware that they are being observed and this can be minimised by explaining to them the importance of them being honest and assuring them of anonymity (Brink 2004:108). There were no problems as the questionnaire in the main was a structured closed-ended type and the respondents understood what was requested of them.

**3.5.2 External validity**

External validity refers to the degree to which the results of the study can be
generalised to other people and other settings (Brink 2004:106). The findings for this study can only be generalised to the two hospitals under study. However, laparoscopic surgery is current and the most preferred method of surgery. It is therefore contended that the results and recommendations from this study could also benefit nurses and patients in other health care services and scholars who may engage in a similar research project. Caution has to be expressed, as situational factors may also influence the results of other similar studies conducted in the same field in other hospitals.

3.6 INSTRUMENT VALIDITY AND RELIABILITY

Reliability and validity are closely related meaning that reliability is a part of validity in that if an instrument does not yield reliable results it is not valid (Brink 2008:165).

Validity

Validity is the degree to which an instrument measures what it is supposed to measure (Polit & Beck 2010:377). The type of validity that is appropriate in this study is content validity which, according to Polit and Beck (2010:377), concerns the degree to which an instrument has items pertaining to the construct being measured. Validity was further attained by submission of the questionnaires to experts like the researcher’s supervisor and a professional nurse who had years of experience with patients undergoing laparoscopic surgery so that it could be ascertained whether the information in the questionnaires were relevant and adequately covered the construct being investigated.

Reliability

Polit and Beck (2010:373) describe reliability as the consistency with which an instrument measures the target attribute, yielding more or less the same results when tested again on the same group or on another group. Polit and Beck (2008:452) further state that if on repeated measurements there is less variations produced by the instrument then reliability exists. Brink (2008:164) defines internal consistency as addressing the extent to which all items on an instrument measure the same variable and the aspect of reliability tested in this study had internal consistency because the variable measured was knowledge of laparoscopic surgery.
The physical and the psychological environment was made conducive to the respondents by the researcher because the questionnaires were discussed with them and the nurses were given time to take the questionnaires home and answer them in the comfort of their homes. The patients on the other hand were given the questionnaires in the presence of the researcher and in private and at a time convenient to them. Reliability was further enhanced because the researcher tried to keep the circumstances the same when respondents answered the questionnaire so that response errors were minimised and conditions were standardised. Permission was requested from all respondents before the questionnaire was given to them. Moreover, pretesting the questionnaire enhanced the reliability as ambiguities were sorted out and all respondents were able to understand the questions asked.

3.7 DATA COLLECTION PROCEDURE

The literature highlights various data collection methods, namely, mail, telephonic, personal and more recently e-mail or use of the Internet. For the purposes of this study, the self-administered questionnaires were distributed personally to the respondents by the researcher. The time period allocated for data collection was between May and July 2011. The questionnaire was discussed with the respondents prior to them signing the consent and they were hand delivered to both the theatre and ward nurses giving them about a week to answer the questionnaire whilst others gave the completed questionnaire to the researcher on the same day. Theatre and ward nurses were given the opportunity to answer the questionnaires at home and collected a week later by the researcher sometimes via the unit manager. A few ward nurses especially those that were not currently studying and trained a long time ago were adamant in their refusal to answer the questionnaire indicating that it was unnecessary. Although the importance of the study was emphasized and the questionnaire explained these nurses still refused. When it came to the patients the theatre staff was phoned the day prior to surgery i.e. when the patients were admitted to the ward. Permission was asked by the researcher from the nurse in charge to visit the patients in the wards. On arrival to the ward, documentation regarding the ethical clearance from the University of South Africa, the letter of approval from the Department of Health (Annexure A2) and from that particular hospital (Annexure B1 and C1) was shown to the nurse in charge. The researcher firstly introduced herself and gave her reason for the visit outlining the reason and purpose of the study. The patients were explained about the consent giving them an option to
refuse. The researcher was present when patients answered the questions ensuring objectivity at all times. The questionnaire was collected on the same day.

3.8 DATA ANALYSIS

Data analysis was done with the assistance of a statistician. The Statistical Package for Social Sciences (SPSS) version 15 for Windows was used by the Statistician. As the data in the questionnaire was ordinal in nature, the researcher coded and captured the data of the respective questionnaires to form two data sets on a USB flash stick. Descriptive statistics were used to synthesise and describe data as defined by Polit and Beck (2010:392) and in this study it was used to analyse data in relation to each question. Frequencies and percentages for each item pertaining to each question were computed. Descriptive statistics are presented in tables, pie and bar graphs. The open-ended questions are merely substantiated or reported by the researcher as these questions probed deeper to determine the reasons for the respondents’ answers including the exploration of their knowledge of laparoscopic surgery and its advantages and disadvantages. The more robust tools of inferential statistics were not possible because the data was mainly in ordinal and nominal in nature.

3.9 ETHICAL CONSIDERATIONS

Every individual is unique and has to be treated as such. Individuals have rights and these need to be respected. Parahoo (2006:111) states that nurses need to know the implications of research to be able to safeguard patient’s rights and ensure their safety. According to Parahoo (2006:112), there are six ethical principles that health professionals can use to guard their patients or clients from harm, namely, beneficence, non-maleficence, fidelity, justice, veracity and confidentiality. Polit and Beck (2004:147-152) emphasise the principle of respect for human dignity, the principle of justice and informed consent. Burns and Grove (1999:162-163), include the right to privacy and the right to anonymity.

The researcher adhered to the following ethical principles during the field work related to this study:
Informed consent

Informed consent according to Polit and Beck (2010:127) means that the participants have adequate information regarding the research and are capable of comprehending the information and have the power of free choice to consent to or decline participation voluntarily and this is documented in a consent form which the respondents sign. Polit and Beck (2010:122), define the principle of the right of self determination as the right of the prospective participants to decide voluntarily whether to participate in the study or not. It further includes the participants’ rights to ask questions, to refuse to give information, to ask for clarification and to terminate their participation. The right of self-determination includes freedom from coercion which occurs when an overt threat or harm or an excessive reward is intentionally presented by one person to another to obtain compliance (Burns & Grove 1999:158). The right to self-determination and the right to full disclosure are the two main elements on which informed consent is based including the person’s right to refuse participation, the researcher’s responsibilities and the likely risks and benefits.

The consent was explained to the respondents prior to them signing it and only after signing it were they allowed to complete the questionnaire. Prior to the respondents answering the questionnaire they were given a brief outline on the contents of the questionnaire, the reason for the signing of the consent and the fact that they could withdraw at any time without penalty. The purpose of the study was explained to them. This information was offered to them verbally before the signing of the consent.

Beneficence

Polit and Beck (2010:121) define beneficence as a fundamental ethical principle that seeks to maximise benefits for study participants and prevent harm. Beneficence includes the right to freedom from harm and discomfort and the right to protection from exploitation. The right to freedom from harm and discomfort according to Polit and Beck (2008:170) was important and this was practiced in this study because the respondent was asked to sign a consent form prior to them answering the questionnaire and the respondent was allowed to refuse to participate in the study and it was also stressed that their participation or the information they provided was not going to be used against them. The questions asked in the study were not intrusive. This study can benefit the
participating individuals by making them more aware about laparoscopic surgery and hopefully to encourage them to ask questions about laparoscopic surgery and its aftercare if they are uncertain. Future patients and nurses may benefit from the findings and implementation of the recommendations of the study if measures are put into place to enhance their knowledge and understanding of laparoscopic surgery. Patients could take care of themselves optimally post-operatively and nurses will be able to cascade the correct information to their patients about laparoscopic surgery.

- **Non-maleficence**

Non-maleficence means avoiding, preventing or minimising harm and this relates not only to physical harm but also to psychological harm and although questions needed to be asked the researcher tried not to be too intrusive (Polit & Beck 2010:121). Although interviews may be more intrusive than questionnaires, questionnaires can be intrusive if one asks embarrassing and sensitive questions which in this study the researcher avoided altogether as it is an unethical practice. Pera and Van Tonder (2011:55) state that “one ought not to inflict evil or harm” as an obligation to non-maleficence. The researcher ensured that the principles of confidentiality and anonymity were explained to the respondents and the patients were reassured that no information was going to be divulged to the doctors.

- **Justice**

Polit and Beck (2010:124-125) describe the principle of justice as being divided into the right to privacy and the right to fair treatment. The right to fair treatment includes selecting participants on research requirements, and not on the vulnerability or compromised position of certain people. The researcher should not be prejudiced if participants wish to withdraw and needs to be tactful and courteous at all times and this is catered for in the consent form (Polit & Beck 2004:149). The researcher reassured the participants that the selection was based on certain criteria and any patient or nurse fitting the eligibility criteria was chosen as a respondent using the convenience sampling technique, as long as they were voluntarily willing to answer the questionnaire. There was no discrimination based on age, disability, gender, race or religion.
• Veracity

Veracity is an ethical principle one needs to adhere to as a researcher. This ethical principle is incorporated in the informed consent where the participants are told the truth even if telling the truth means the withdrawal of the participant from the study (Parahoo 2006:112).

Integrity

Pera and Van Tonder (2011:79) state that integrity refers to having a sense of self as a whole and presenting the authentic self to the patient and the nurse should be honest and transparent. Polit and Beck (2010:493), explain that integrity is shown by on-going self-reflection and self-scrutiny to ensure that interpretations are valid and grounded in the data in other words be honest and have a good conscience and report facts. Misconduct in research is due to fabrication and falsification of data through inappropriate techniques of analysis, plagiarism and dishonest manipulation of the design or methods (Pera & Van Tonder 2011:340). This has serious consequences in the research and scientific community and all researchers in the main have to abide by an appropriate code of conduct. The researcher is of the firm belief that the research design and methodology were appropriate for the study and discussed the methodology in detail. The statistical findings have been reported honestly, references are provided and all sources have been acknowledged in the bibliography.

• Autonomy

Brink (2008:32) describes autonomy as having the right to whether or not to participate in the study and to withdraw from the study at any time without the risk of penalty and prejudicial treatment and this was outlined in the consent form which the respondents signed prior to them answering the questionnaire.

• Anonymity

Anonymity refers to the fact that information related to respondents should not be traceable to their names and not made available to anyone beyond the immediate research team. The data collection tool (questionnaire) stipulated that the respondent
should not write her/his name anywhere ensuring the principle of anonymity. Polit and Beck (2008:180) define anonymity as the most secure method of protecting confidentiality and it occurs when even the researcher cannot link participants to their data. The researcher ensured that the questionnaire did not allow for the respondents name so that anonymity was secured. Although the questionnaires were given to the respondents it was collected by the unit manager and given to the researcher making it impossible to differentiate between the different questionnaires.

- **Confidentiality**

Confidentiality refers to the researcher’s responsibility to protect all data gathered during the research from being divulged to any other person except the people involved unless the researcher has been given explicit permission from the participant to make it known (Brink 2004:41). The questionnaires were kept under lock and key with no access to anybody except the researcher and the statistician.

Each questionnaire has a code and it would be destroyed after 5 years. The researcher will ensure that the findings of this research will only be available to the participating Hospitals, the Department of Health and not to individuals. Patients have a right to expect that any information that is given should be kept in the strictest of confidence unless authorised by the subject (Burns & Grove 1999:163; Parahoo 2006:311). The results from the two hospitals were generalised in such a way that it was difficult to ascertain where the information was derived from. No information was given to any unauthorised persons except to the hospitals involved. Polit and Beck (2010:129) define confidentiality as a pledge that any information participants provide will not be publicly reported in a manner that identifies them and will not be made accessible to others. Pera and Van Tonder (2011:81) state that the confidentiality of personal information is protected by the National Health Act No. 61 of 2003 which stipulates that any health care worker that has access to health records of a user should only disclose information to another person, health care provider or health establishment for any legitimate purpose if this disclosure will be in the interest of the user.

### 3.10 CONCLUSION

The researcher used a quantitative descriptive design. The data collection method used
was questionnaires which included both closed and open ended questions. Two different sets of questionnaires were distributed to nurses and patients respectively. The study involved nurses and patients from two government aided hospitals where permission to conduct the research was granted in writing. The Department of Health Studies, UNISA also vetted the research proposal and the questionnaires and a Clearance Certificate (Annexure D) was given in meeting the ethical considerations pertaining to the research. The Department of Health granted approval (Annexure A2) in writing to conduct the research at the two hospitals. The researcher ensured that all ethical principles were adhered to in this study. This chapter included the research approach and design, the population and sampling, the questionnaire design, the constructs of validity and reliability and the methods of data collection. The following chapter highlights the analysis of data and discussion of the findings.
CHAPTER 4

ANALYSIS OF RESULTS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

This chapter presents the data analysis, interpretation and analysis of results and discussion of findings of the research study. The purpose of this study was to establish professional nurses’ and patients' knowledge and understanding of laparoscopic surgery and to determine whether the nurses are sufficiently knowledgeable to disseminate adequate information about laparoscopic surgery to patients. The time period allocated for data collection was between May 2011 and July 2011 and the method used was by means of a questionnaire. A convenient sample of 50 operating theatre nurses, 90 ward nurses and 42 patients were selected in the two government aided hospitals, namely, the King Edward VIII and Inkosi Albert Luthuli Central Hospital in KwaZulu-Natal. A total of 182 questionnaires were distributed of which 14 questionnaires were not returned. The sample size comprised 39 operating theatre nurses, 87 ward nurses and 42 patients scheduled for laparoscopic surgery (Table 4.1). Participation was voluntary and respondents signed an informed consent prior to the answering of the questionnaire. An excellent response rate was elicited using the personal method of data collection as highlighted in Table 4.1 and Figure 4.1.

Table 4.1 Response rate of questionnaires distributed

<table>
<thead>
<tr>
<th>Response rate</th>
<th>Questionnaires distributed</th>
<th>Questionnaires received</th>
<th>Response rate Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward nurses</td>
<td>90</td>
<td>87</td>
<td>97</td>
</tr>
<tr>
<td>Theatre nurses</td>
<td>50</td>
<td>39</td>
<td>78</td>
</tr>
<tr>
<td>Patients</td>
<td>42</td>
<td>42</td>
<td>100</td>
</tr>
</tbody>
</table>
4.2 QUESTIONNAIRES

The questionnaire administered personally to the professional nurses (Annexure F) comprised of sections A, B, C and D which were answered by the operating theatre nurses whilst the ward nurses omitted section C because it catered for intraoperative functions only. The questionnaire that was completed by the patients (Annexure G) comprised of sections A, B and C. The data collected was coded and analysed using the SPSS. Data analysis was done with the assistance of a statistician. Descriptive statistics were used to synthesise and describe data as defined by Polit and Beck (2010:392) and in this study it was used to analyse data in relation to each question. Frequencies and percentages for each item pertaining to each question were computed. It should be noted that the majority of the questions for both categories of respondents were statistically analysed using descriptive statistics shown in a numbered Table and the same question was also depicted in a numbered Figure, using the pie chart and stacked bar graphs. The responses to the few open-ended questions are reported by the researcher as these questions probed deeper to determine the reasons for the respondents’ answers including the exploration of their knowledge of laparoscopic surgery and its advantages and disadvantages.
4.3 ANALYSIS OF RESULTS FROM THE NURSES’ QUESTIONNAIRE

4.3.1 Section A: Analysis of demographic data of nurses

Questions 1-7 covered demographical data about the theatre and the ward nurses which included age, rank category and years of experience, gender, race and their location of service. Mosby’s Dictionary of Medicine, Nursing and Health Professions (2006:527), define demography as the study of human populations particularly the size, distribution and characteristics of members of population groups. Demography may be described as properties of an individual or sample that can be regarded as factual and is often for variables such as age, social class, working status (theatre-trained and non-theatre trained) and geographic location (ward/operating theatre).

Burns and Grove (2009:178) define demographic variables as the attributes of the subjects that are measured during the study which are used to describe the sample. Although demographical data are not the focus of the study it was used for analysis purposes where cross tabulations can be conducted to interpret the findings.

4.3.1.1 Age distribution of ward and theatre nurses

The majority of respondents were in the age group 26-45 years of age with 66 (75.9%) ward nurses and 29 (74.4%) theatre nurses, respectively. Table 4.2 and Figure 4.2 respectively illustrate the age distribution of the ward and theatre nurses.

In order for a person to become a professional nurse she/he needs to have a matric certificate and in order to become a registered professional nurse she/he needs to train for four years and work in the ward for a year before she is allocated to the operating theatre which involves a specialised area of work.
Table 4.2  Age distribution of nurses

<table>
<thead>
<tr>
<th>Age</th>
<th>Ward nurses (n=87)</th>
<th>Theatre nurses (n=39)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent (%)</td>
<td></td>
</tr>
<tr>
<td>18-25 Years</td>
<td>3</td>
<td>3.4</td>
<td>1</td>
</tr>
<tr>
<td>26-35 years</td>
<td>28</td>
<td>32.2</td>
<td>11</td>
</tr>
<tr>
<td>36-45 years</td>
<td>38</td>
<td>43.7</td>
<td>18</td>
</tr>
<tr>
<td>46+ years</td>
<td>18</td>
<td>20.7</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100.0</td>
<td>39</td>
</tr>
</tbody>
</table>

**Figure 4.2  Age distribution of ward and theatre nurses**

**4.3.1.2  Gender of nurses**

As illustrated in Figure 4.3, the analysis showed that 116 (92%) of the respondents were female and 10 (7.9%) male in both the wards and theatres due to the fact that nursing is predominately in the domain of females.
4.3.1.3 Nurses’ race grouping

The majority of respondents, 69 (79.3%) ward nurses and 32 (82.1%) theatre nurses were Black with only 3 (3.5%) Coloured ward nurses and no Coloured theatre nurses that completed the questionnaire as depicted in Table 4.3 and Figure 4.4. The Asian nurses were evenly distributed between the ward and theatre as indicated by 15 (17.2%) ward nurses and 7 (17.9%) theatre nurses. This finding could be attributed to the fact that in the State hospitals chosen for this study, the nursing staff distribution demonstrated a majority of Black nurses followed by Asians with Coloureds being a small minority.

Table 4.3 Race distribution of theatre and ward nurses

<table>
<thead>
<tr>
<th>Race</th>
<th>Ward nurses (n=87)</th>
<th></th>
<th></th>
<th>Theatre nurses (n=39)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent (%)</td>
<td>Race</td>
<td>Frequency</td>
<td>Percent (%)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>69</td>
<td>79.3</td>
<td>Black</td>
<td>32</td>
<td>82.1</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>15</td>
<td>17.2</td>
<td>Asian</td>
<td>7</td>
<td>17.9</td>
<td></td>
</tr>
<tr>
<td>Coloured</td>
<td>3</td>
<td>3.5</td>
<td>Coloured</td>
<td>0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100.0</td>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
4.3.1.4 Nursing experience

Table 4.4 and Figure 4.5, show that 37 (42.5%) of the ward nurses had 6-10 years of experience whilst 17 (43.6%) theatre nurses had 16 years and longer experience and these respondents were chosen because they were available at the time of the distribution of the questionnaires. Laparoscopic surgery was formally introduced in South Africa in 1991 (History of Society 2013).

Table 4.4 Nursing experience of ward and theatre nurses

<table>
<thead>
<tr>
<th>Ward nurses (n=87)</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>Theatre nurses (n=39)</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>6</td>
<td>6.9</td>
<td>1-5 years</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>6-10 years</td>
<td>37</td>
<td>42.5</td>
<td>6-10 years</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>11-15 years</td>
<td>17</td>
<td>19.6</td>
<td>11-15 years</td>
<td>7</td>
<td>18.0</td>
</tr>
<tr>
<td>16+ years</td>
<td>27</td>
<td>31.0</td>
<td>16+ years</td>
<td>17</td>
<td>43.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>87</strong></td>
<td><strong>100.0</strong></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
4.3.1.5 Knowledge about laparoscopic surgery

Slightly more than half, 50 (57.5%) of the ward nurses and 50 (59%) of theatre nurses rated themselves as being knowledgeable and very knowledgeable about laparoscopic surgery. The role of theatre nurses is to assist the surgeon in operative procedures and therefore they may have more knowledge about laparoscopic surgery than the ward nurses.

Phillips (2007:648) confirms that due to the intricacies of the instrumentation and the limits of the visual field strict adherence to details and astute anticipation during the surgery is required hence the need for adequate knowledge.

Table 4.5 Nurses’ knowledge about laparoscopic surgery

<table>
<thead>
<tr>
<th>Knowledge of laparoscopic surgery</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>Knowledge of laparoscopic surgery</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No knowledge</td>
<td></td>
<td></td>
<td>No knowledge</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>5.7</td>
<td>2</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>33.4</td>
<td>3</td>
<td>9</td>
<td>23.0</td>
</tr>
<tr>
<td>4</td>
<td>41</td>
<td>47.1</td>
<td>4</td>
<td>12</td>
<td>30.8</td>
</tr>
<tr>
<td>Very knowledgeable</td>
<td>9</td>
<td>10.3</td>
<td>Very knowledgeable</td>
<td>11</td>
<td>28.2</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100.0</td>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.3.2 Section B: Pre-operative phase related to nurses

The questions (Annexure F) for the pre-operative phase were answered by both the ward and theatre nurses. The analyses are computed hereunder.

4.3.2.1 Nurses’ views on whether patients are well informed about laparoscopic surgery

Table 4.6 and Figure 4.7 show whether respondents thought that patients were well informed about laparoscopic surgery. Respondents had to give reasons for their answers. Eleven (28.2%) theatre nurses and 42 (48.3%) ward nurses affirmed that patients were well informed about laparoscopic surgery whilst 2 (5.1%) theatre nurses and 20 (23%) ward nurses disagreed. Twenty four (61.6%) theatre nurses and 22 (25.3%) ward nurses indicated that only some patients were well informed. Ward nurses who stated that patients were not informed clarified this statement by stating that the potential complications post-operatively were not explained whereas the theatre nurses concluded that the patients were not informed because some patients although having signed consent for laparoscopic surgery, questioned the nurse continuously.
about the procedure. Due to their heavy work load and busy schedules, doctors according to the researcher’s observation had the tendency to leave out the finer details when explaining the procedure. Consents are taken in the ward by the doctor and witnessed by the ward nurses whilst the theatre nurses check whether the confirmed consent is present in the patient’s file when the patient arrives in the operating theatre unit before surgery is performed. Informed consents according to Pera and Van Tonder (2011:72), has two interpretations, namely, one where the patient has to agree with the informed consent and also has to sign it; and the other which refers to formal procedures that need to be followed before proceeding with diagnostic and therapeutic procedures.

Table 4.6 Nurses’ views on whether patients are well informed about laparoscopic surgery

<table>
<thead>
<tr>
<th>Patients well informed</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>48.3</td>
<td>11</td>
<td>28.2</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>23.0</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td>Some are, some are not</td>
<td>22</td>
<td>25.3</td>
<td>24</td>
<td>61.6</td>
</tr>
<tr>
<td>Do not know</td>
<td>3</td>
<td>3.4</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100.0</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.7 How well patients are informed about laparoscopic surgery
4.3.2.2 Safeness of laparoscopic surgery and possible complications

Respondents were asked whether they felt that laparoscopic surgery was safe or not and a substantiation was required. As illustrated by Table 4.7 less than half, 39 (44.8%) ward nurses and 8 (20.5%) theatre nurses regarded laparoscopic surgery as safe. A further 30 (76.9%) theatre nurses and 41 (47.1%) ward nurses viewed laparoscopic surgery as usually safe but mentioned there was the possibility of complications due to failure to stop the bleeding, penetration of sharp objects, inexperienced surgeons and anaesthetic problems as a result of carbon dioxide insufflation. The possibility of conversion to open surgery as well as damage to other organs was also mentioned.

Table 4.7 Nurses’ views on the safeness of laparoscopic surgery

<table>
<thead>
<tr>
<th>Patients well informed</th>
<th>Ward nurses (n=87)</th>
<th>Theatre nurses (n=39)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent (%)</td>
</tr>
<tr>
<td>Safe</td>
<td>39.0</td>
<td>44.8</td>
</tr>
<tr>
<td>Unsafe</td>
<td>4.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Usually safe but there may be complications</td>
<td>41.0</td>
<td>47.1</td>
</tr>
<tr>
<td>Do not know</td>
<td>3.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>87.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.3.2.3 Laparoscopic surgery versus open surgery

As shown in Table 4.8, all the theatre nurses, 39 (100%), felt that possible conversion to open surgery should be mentioned in the consent form of a patient undergoing laparoscopic surgery, but only 71 (81.6%) ward nurses felt it was necessary to give informed consent while 6 (6.9%) ward nurses did not know what laparoscopic surgery was. The ward nurses as well as the theatre nurses felt this was necessary because with laparoscopic surgery one would expect no pain and small scars unlike open surgery where the incision is big and pain would be increased and this could cause anxiety to the patient. The ward nurses stated that the consent should include possible conversion to open surgery for the prevention of litigation, adherence to patients’ rights charter and the right to make their own decisions based on the information given and being informed about the possible complications if surgery is open so as to prepare them psychologically. The theatre nurses felt the same way with the proviso that intra-
operatively, if problems were encountered the conversion to open surgery would be allowed and the patients would have been informed prior to the surgery taking place. Rothrock (2007:319) contends that the potential for conversion to an open approach should be discussed with the patient before surgery and documented by the surgeon on the consent form.

Table 4.8  Conversion to open surgery mentioned in consent

<table>
<thead>
<tr>
<th>Conversion to open surgery must be mentioned</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>71</td>
<td>81.6</td>
<td>39</td>
<td>100.0</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>11.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Do not know</td>
<td>6</td>
<td>6.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

4.3.2.4  Advice to patients and own preference regarding surgical approach

(a)  Nurses’ advice to patients on surgical approaches

Pertaining to the advice the respondent would give to the patient regarding the surgical approach, Table 4.9 affirms that 66 (75.9%) of the ward nurses and 29 (74.4%) of the theatre nurses indicated that they would advise their patients to have the operation done laparoscopically. The reasons given by some of the ward nurses for their preference for laparoscopic surgery for the patients were that there would be less complications and reduced infection because it would not be an open wound. The theatre nurses indicated less scarring, faster recovery, less hospital stay and less infection post-operatively. The respondents also believed that the pain post-operatively would be less as compared to open surgery.
Table 4.9  Nurses’ advice to patients on surgical approaches

<table>
<thead>
<tr>
<th>Nurses’ advice to patients</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Laparoscopic surgery</td>
<td>29</td>
<td>74.4</td>
<td>66</td>
<td>75.9</td>
</tr>
<tr>
<td>Open surgery</td>
<td>10</td>
<td>25.6</td>
<td>15</td>
<td>17.2</td>
</tr>
<tr>
<td>Do not know</td>
<td>-</td>
<td>0.0</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(b) Nurses’ preference for surgical approach

Most theatre nurses 27 (69.2%), as well as ward nurses 65 (74.7%) opted for the open approach on themselves, although they advised the patients to have their operation done laparoscopically as illustrated in Table 4.10 and Figure 4.8. According to the researcher, the reason for this is that the laparoscopic approach is fairly recent and the tissue is manipulated inside the body using the monitor as a means of visualisation. Nurses are still afraid of new technology and the fact that tissues are handled by instruments rather than by the surgeon’s hands could be quite daunting and hence their preference for open surgery on themselves.

Table 4.10  Nurses’ preference for surgical approach

<table>
<thead>
<tr>
<th>Preference</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Laparoscopically</td>
<td>11</td>
<td>28.2</td>
<td>12</td>
<td>13.8</td>
</tr>
<tr>
<td>Open procedure</td>
<td>27</td>
<td>69.2</td>
<td>65</td>
<td>74.7</td>
</tr>
<tr>
<td>No preference</td>
<td>1</td>
<td>2.6</td>
<td>10</td>
<td>11.5</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.3.2.5 Advantages and contra-indications of laparoscopic surgery

When the ward and theatre nurses were asked about the advantages of laparoscopic surgery, they commented on the smaller incisions, quicker post-operative recovery, less surgical site infections, less complications and faster operation if the surgeon was experienced. Rothrock (2007:184) reports that patients undergoing laparoscopic surgery experience less abdominal discomfort due to the small incision(s), fewer post-operative complications, less potential for surgical site infections, improved cosmesis, shorter recovery period and quicker return to daily activities. When it came to contraindications, respondents failed to answer implying that they did not know.

4.3.3 Section C: Intra-operative phase related to nurses

Section C (Annexure F) comprises the intra-operative phase and therefore was answered by theatre nurses only.
4.3.3.1 Experience as theatre nurses

Table 4.11 and Figure 4.9 highlight that experience in the operating theatre by theatre nurses ranged from 1 year to 16 years and over. A small number of theatre nurses 8 (20.5%), had less experience, between 1 to 5 years whereas the majority 31 (79.5%), had between 6-16 years and longer experience in theatre. As the theatre nurses in this study have been working in theatre between 1 to 16 years they must have been exposed to laparoscopic surgery from the beginning since this type of surgery was introduced in the country in the early 1990s (History of the Society 2013). They therefore had the opportunity to become more knowledgeable about laparoscopic surgery.

Table 4.11 Years of theatre experience

<table>
<thead>
<tr>
<th>Experience</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>8</td>
<td>20.5</td>
</tr>
<tr>
<td>6-10 years</td>
<td>13</td>
<td>33.4</td>
</tr>
<tr>
<td>11-15 years</td>
<td>8</td>
<td>20.5</td>
</tr>
<tr>
<td>16+ years</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.9 Theatre experience

4.3.3.2 Diploma in operating theatre technique

As depicted in Figure 4.10, slightly more than half 21 (53.8%) of the theatre nurses affirmed that they did not have a diploma in operating theatre technique meaning they
were not formally trained as a theatre nurse but gained experience as they worked in theatre whereas 18 (46.2%) did have a Diploma.

![THEATRE TRAINED](image)

**Figure 4.10 Theatre trained**

### 4.3.3.3 Mentoring of theatre nurses

Questions were asked about whether theatre nurses were mentored when they first started scrubbing for laparoscopic surgery and by whom. As illustrated in the pie chart in Figure 4.11 the majority of the theatre nurses 36 (92.3%), indicated they were mentored during the surgery by their supervisors with special focus on the handling of instruments which is integral in laparoscopic surgery. Only 3 (7.7%) theatre nurses were not mentored. Mentoring is often identified as a crucial step in achieving career success and a mentor is a role model. Shiwan (2007) and Rothrock (2007:319) explain that minimal access surgery requires the use of specially designed instruments. Theatre nurses have to learn about the different laparoscopic surgery instruments, what they look like and what they are used for as to be able to assist the surgeon appropriately.
4.3.3.4  Theatre nurses’ experience with assisting during laparoscopic surgery

This question dealt with the theatre nurses' experience with assistance during laparoscopic surgery. As illustrated in Figure 4.13, the majority 37 (94.9%) theatre nurses had assisted with laparoscopic surgery. Table 4.12 and Figure 4.12 show that 12 (30.8%) theatre nurses have scrubbed for 16 and more cases of laparoscopic surgeries, while 13 (33.3%) theatre nurses had scrubbed for 1-5 cases leaving 14 (35.9%) of theatre nurses having scrubbed for 6-15 cases.

Table 4.12  The number of laparoscopic surgeries that theatre nurses scrubbed for

<table>
<thead>
<tr>
<th>How many cases</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>13</td>
<td>33.3</td>
</tr>
<tr>
<td>6-10</td>
<td>9</td>
<td>23.1</td>
</tr>
<tr>
<td>11-15</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>16 and over</td>
<td>12</td>
<td>30.8</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.3.3.5 Description of assistance

When asked to describe the assistance, only 2 (5.2%) theatre nurses found assisting with laparoscopic surgery difficult and 3 (7.7%) found it easy. Thirty one (79.5%) theatre nurses felt that assistance was easy but challenging and 11 (28.2%) indicated that it varied with different surgeons although 10 (25.6%) stated that assistance became easier over time (Table 4.13). Respondents who said that assistance was easy attributed this to the fact that one could visualise the procedure on the monitor making anticipation easy. Theatre nurses felt that the challenging part of the operation was the instrumentation, the handling and cleaning thereof. Phillips (2007:649) emphasises the
importance of training for and demonstration of competence in the use and care of endoscopic equipment by surgeons and peri-operative personnel so that potential patient injuries and complications are reduced. The respondents, who said that assistance was difficult, clarified this statement by saying that they did not scrub for laparoscopic surgery hence their lack of knowledge.

Table 4.13 Description of assistance

<table>
<thead>
<tr>
<th>Assistance described as</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult</td>
<td>2</td>
<td>5.2</td>
</tr>
<tr>
<td>Easy but challenging</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Easy</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>It varies for surgeons</td>
<td>11</td>
<td>28.2</td>
</tr>
<tr>
<td>It becomes easier with time</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Do not know</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

4.3.3.6 Outcome of operation depends on the surgeon

As shown in Table 4.14 and Figure 4.14 the majority, 32 (82%) theatre nurses indicated that the outcome did depend on the expertise of the surgeon. The reasons provided were due to the fact that if the surgeon is not knowledgeable the possibility of complications is increased and the rate of conversions to open surgery will also increase. One (2.6%) respondent stated that the outcome was not due to the expertise of the surgeon because of her apparent inexperience when it came to scrubbing for laparoscopic surgery as she was one of those who scrubbed for 1-5 cases. Twijnstra, Bikkendaal, Van Zwet, Van Kesteren, De Kroon and Jansen (2012:700-708), did a study on the outcome of laparoscopic hysterectomy to establish to what extent a successful outcome can be predicted from surgical experience or other measures of skill. It was concluded that an increase in experience positively predicted a successful outcome in laparoscopic hysterectomy with respect to blood loss and any adverse events. In addition it was stated that although the surgeon could have performed many surgeries it did not necessarily guarantee a good surgical outcome.
4.3.3.7 Length of laparoscopic surgery

Whether laparoscopic surgery took longer than open surgery, Table 4.15 and Figure 4.15 show that slightly more than half 22 (56.4%) of theatre nurses agreed that the operating time taken for laparoscopic surgery is shorter than for open surgery and attributed this to clear visualisation of the organs, small incisions, less bleeding, fewer instruments and the expertise of the surgeon. Five (12.8%) respondents were of the opinion that it took the same time and indicated that length of time depended on the expertise of the surgeon whilst 9 (23.1%) respondents indicated laparoscopic surgery took longer time than open surgery and attributed this to the fact that surgeons did not have direct access to the organs, and may experience difficulty in manipulating the instruments or could be inexperienced surgeons. Phillips (2007:648) asserts that landmarks can look distorted and unusual through an endoscope and therefore an inexperienced person would not be able to recognise structures and the eyes are not directed to the area of manipulation.
Table 4.15  Length of time of laparoscopic surgery

<table>
<thead>
<tr>
<th>Length of time of laparoscopic surgery</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longer</td>
<td>9</td>
<td>23.1</td>
</tr>
<tr>
<td>The same</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>Shorter</td>
<td>22</td>
<td>56.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.15  Length of time of laparoscopic surgery

4.3.3.8 Problems experienced during scrubbing for laparoscopic surgery

Respondents were asked whether they had encountered any problems during scrubbing for laparoscopic surgery and as illustrated by Table 4.16 and Figure 4.16, 29 (74.3%) theatre nurses affirmed that they experienced problems occasionally, 3 (7.7%) experienced problems frequently and 6 (15.4%) never experienced problems. Respondents were asked to substantiate their answers. The theatre nurses reported that the problems encountered while they were scrubbed for laparoscopic surgery included the many conversions to open surgery, patients having many adhesions, surgeons puncturing the arteries, obese patients and many perforations.

Obesity is a high risk factor for patients undergoing laparoscopic surgery. Pikarsky, Saida, Yamaguchi, Martinez, Chen, Weiss, Nogueras and Wexner (2002:855-858), found that laparoscopic colorectal segmental resections are feasible in obese patients,
but increased rates of conversion to laparotomy should be anticipated and the risk of post-operative complications is significantly increased, prolonging the length of hospitalisation when compared to that of non-obese patients.

It is important that conversion to open surgery be mentioned in the consent form and this is verified also by Hebber (2006) when they emphasise that consent must be taken after a discussion of possible complications and also that a conversion to open surgery may be necessary to complete the planned procedure since up to 25% of laparoscopic surgeries may be converted to open. Conversion to open surgery mentioned in the consent form is mandatory because of patient autonomy and rights. Omission of this would result in the patient never trusting the health team again, possible litigation for non-disclosure as well as increased anxiety pertaining to the fact that a small incision was expected rather than a big one.

Table 4.16  Problems experienced whilst scrubbing for laparoscopic surgery

<table>
<thead>
<tr>
<th>Problems experienced</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>Occasionally</td>
<td>29</td>
<td>74.3</td>
</tr>
<tr>
<td>Frequently</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Do not know</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.16 Problems experienced whilst scrubbing for laparoscopic surgery
4.3.3.9 **Complications of laparoscopic surgery**

Respondents were asked whether they thought that the insertion of the veress needle can cause injuries and 30 (76.9%) theatre nurses confirmed this as depicted in Table 4.17 and Figure 4.17, although in their experience they had never experienced it. Schäfer, Lauper and Krähenbühl (2001:275-280), conducted a study on Trocar and Veress needle injuries during laparoscopy and discovered that although Trocar and Veress needle injuries are rare complications of laparoscopy, if not recognised and repaired immediately intra-operatively morbidity and mortality rate is increased.

**Table 4.17  Could insertion of veress needles cause injuries**

<table>
<thead>
<tr>
<th>Could insertion of veress needles cause injuries</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>30</td>
<td>76.9</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>23.1</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100.0</td>
</tr>
</tbody>
</table>

![Figure 4.17 Possibility of veress needle insertion injury](image)

4.3.3.10 **Conversions to open surgery**

When asked about the percentage of cases that were conversions to open surgery 21 (53.8%) of theatre nurses reported 0-25% cases which implied that there were not many conversions. Ten (25.6%) of the respondents indicated that with 26-50% of cases there
was a possibility of conversions to open surgery (Table 4.18 and Figure 4.18). This was a close ended question so no substantiation was required. Respondents could have answered honestly taking their clinical experience into account.

Most of the theatre nurses failed to answer question 8 because they did not know what extracorporeal and intracorporeal meant. Extracorporeal according to Rothrock (2007:190), is when although the tissue is approximated intra-abdominally the knot is tied outside and intracorporeal the tissue is still approximated intra-abdominally and the knot is tied inside the abdomen.

Table 4.18 Conversions to open surgery

<table>
<thead>
<tr>
<th>Percentage of cases</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td>21</td>
<td>53.8</td>
</tr>
<tr>
<td>26-50</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>51-75</td>
<td>4</td>
<td>10.3</td>
</tr>
<tr>
<td>76-100</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Do not know</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.18 Percentage of conversions to open surgery
4.3.4 Section D: Post-operative phase related to nurses

Section D included the post-operative phase (Annexure F) which was answered by ward nurses (n=87) and theatre nurses (n=39) respectively. The analyses of the results are shown hereunder.

4.3.4.1 Complications of laparoscopic surgery as compared to open surgery

Pertaining to complications of laparoscopic surgery, almost half of the respondents indicated that less complications would be expected after laparoscopic surgery i.e. 17 (43.6%) theatre nurses and 47 (54%) ward nurses. They indicated that when comparing laparoscopic to open surgery, the complications would be different and less due to less handling of internal organs, less pain, decreased infection and small incisions. The 16 (18.4%) ward nurses, and 7 (17.9%) theatre nurses who stated the same complications and 11 (28.2%) theatre nurses and 6 (6.9%) ward nurses who did not know implied that they lacked information and knowledge about laparoscopic surgery as shown in Table 4.19 and Figure 4.19. Philosphe (2003:30-39) states that no matter how skilled the surgeon is, the risk of complications in laparoscopic surgery does exist, like anaesthetic difficulties, positioning, nerve injuries, injuries due to insertion of needles and trocars and intra-operative vascular, bowel and urinary tract injuries from electrosurgical equipment. The author further elaborates that knowing how to manage these complications is important but avoiding them is prudent and intelligent preventing heartache for both the patient and the surgeon.

Table 4.19 Complications expected after laparoscopic surgery as compared to open surgery

<table>
<thead>
<tr>
<th>Expect different complications?</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>The same complications</td>
<td>7</td>
<td>17.9</td>
<td>16</td>
<td>18.4</td>
</tr>
<tr>
<td>Different but less complications</td>
<td>17</td>
<td>43.6</td>
<td>47</td>
<td>54.0</td>
</tr>
<tr>
<td>Different but more complications</td>
<td>4</td>
<td>10.3</td>
<td>18</td>
<td>20.7</td>
</tr>
<tr>
<td>Do not know</td>
<td>11</td>
<td>28.2</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>
When it came to the severity of the complications Table 4.20 and Figure 4.20 illustrate that 18 (46.1%) theatre nurses and 59 (67.8%) ward nurses assert that it would be less due to the procedure being shorter, less anaesthetic being used and the fact that competent surgeons were doing the operations. It was also stated that bleeding will be less and because patients are ambulated early, complications post-operatively will also be decreased. It was a concern that 19 (21.8%) ward nurses and 6 (15.4%) theatre nurses indicated that the severity of the complications was the same thereby affirming their lack of knowledge pertaining to laparoscopic surgery. Pertinent literature regarding the complication of the incidence of post-operative infections after the most common laparoscopic surgical procedures with that of the corresponding open operations were reviewed and most of the literature was in agreement that laparoscopic surgery was associated with better preservation of immune function and a reduction of the inflammatory response compared to open surgery and the rate of post-operative infections seemed to be significantly lowered (Boni, Benevento, Rovera, Dioniqi, Guiseppe, Bertoglio & Dioniqi 2006:109-111).
Table 4.20 Severity of complications

<table>
<thead>
<tr>
<th>Severity of complications</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>More severe</td>
<td>4</td>
<td>10.3</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>The same severity</td>
<td>6</td>
<td>15.4</td>
<td>19</td>
<td>21.8</td>
</tr>
<tr>
<td>Less severe</td>
<td>18</td>
<td>46.1</td>
<td>59</td>
<td>67.8</td>
</tr>
<tr>
<td>Do not know</td>
<td>11</td>
<td>28.2</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.20 Severity of complications

4.3.4.3 Pre-operative hydration

Both the ward and the theatre nurses were asked whether adequate pre-operative hydration was essential for all patients undergoing laparoscopic surgery and they had to provide reasons if they affirmed that it was necessary. According to Table 4.21, less than half 17 (43.7%) of the theatre nurses and 45 (51.7%) ward nurses indicated that pre-operative hydration was essential and they gave the reason as possible bleeding post-operatively as well as the fact that patients are starved preoperatively so hydration is necessary. Srivastana and Niranjan (2010:91-94) state that the clinical significance of diminished blood flow is not clear but it can be prevented by pre-operative hydration.
Table 4.21  Pre-operative hydration

<table>
<thead>
<tr>
<th>Pre-operative hydration essential to all patients?</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Frequency</td>
<td>Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>45</td>
<td>51.7</td>
<td>17</td>
<td>43.7</td>
</tr>
<tr>
<td>Some</td>
<td>31</td>
<td>35.6</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>None</td>
<td>8</td>
<td>9.3</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td>Do not know</td>
<td>3</td>
<td>3.4</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>100.0</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.3.4.4  Post-operative monitoring of patients

When it came to the post-operative monitoring of patients, theatre and ward nurses were asked what vital signs were needed to be monitored post-laparoscopic surgery and temperature, oxygen saturation, pulse and respiration including blood pressure monitoring was mentioned. They also stated that the post-operative care for both open and laparoscopic surgery was the same. Nurses needed to monitor post-operative nausea and vomiting, wound sites and drains. Graham (2008:41-48) states that post-operative nausea and vomiting is common because of peritoneal insufflation and the manipulation of the bowel and the biliary tract. The use of opioids which is a common cause of post-operative nausea and vomiting should be kept to a required minimum and prophylactic anti-emetics encouraged. Adequate hydration is also mandatory. Respondents were asked about how they would rate the post-operative pain experienced by patients undergoing laparoscopic surgery. As highlighted in Table 4.22 and Figure 4.21, 12 (30.8%) theatre nurses and 64 (73.5%) ward nurses indicated less severe and 24 (61.5%) theatre nurses and 18 (20.7%) of ward nurses felt that the pain would be moderate whilst 3 (7.7%) theatre nurses and 5 (5.5%) ward nurses said it would be more severe. Graham (2008:41-48) further states that pain following laparoscopic surgery is inevitable but each patients' threshold and coping mechanism of pain is different according to gender, age, culture, etc. The use of non-steroidal anti-inflammatory drugs (NSAIDS) and non-opoid analgesics reduce the intensity of pain but not of referred pain which is a result of insufflation of carbon dioxide into the abdominal cavity or irritation of the diaphragm.
Table 4.22  Post-operative pain rating

<table>
<thead>
<tr>
<th>Post-operative pain</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Least severe</td>
<td>1</td>
<td>2.6</td>
<td>13</td>
<td>14.9</td>
</tr>
<tr>
<td>Less severe</td>
<td>11</td>
<td>28.2</td>
<td>51</td>
<td>58.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>24</td>
<td>61.5</td>
<td>18</td>
<td>20.8</td>
</tr>
<tr>
<td>Most severe</td>
<td>3</td>
<td>7.7</td>
<td>5</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.21  Post-operative pain rating

4.3.4.5  Post-operative pain rating

Respondents were asked what they thought the post-operative pain was due to and 14 (35.9%) theatre nurses attributed it to the procedure mainly, whilst 36 (41.4%) ward nurses attributed pain both to the incision and the procedure equally as stipulated in Table 4.23. Those respondents that attributed the pain to the procedure mainly, 14 (35.9%) theatre nurses and 21 (24.1%) ward nurses, explained that the handling of organs and manipulation of instruments in the abdomen caused the pain and that the incision was too small to cause pain The Saudi Journal of Anaesthesia indicates that local pain will be associated with incisions for the operative parts and lower abdominal incisions may depend on the extent of intra-peritoneal manipulation during diagnostic procedures with clips causing less pain than other techniques to occlude the pain. Upper abdominal, shoulder tip and postural high back pain after laparoscopy are likely
to be caused by gas retained in the peritoneal cavity (Gibbison & Kinsella 2009:70-76). Twelve (30.8%) theatre nurses and 6 (6.9%) ward nurses indicated that they did not know to what the pain could be attributed to which meant that they lacked knowledge of what laparoscopic surgery involved.

A qualitative study conducted by Barthelsson, Lutzen, Anderberg and Nordstrom (2003:253-259) aimed at investigating patients’ experience of Laparoscopic cholecystectomy in day surgery. Ten women and two men were interviewed. It was discovered that prior to surgery patients felt anxious and expressed a wish for tranquillisers and to meet the responsible surgeon. At discharge after day surgery amnesia was experienced and respondents did not remember important information about the operation given by the surgeon. When it came to the post-operative pain several respondents had a relapse of pain on the third day lasting up to one week. The need for additional pain medication, the feeling of bloatedness, nausea and vomiting was reported. Some patients asked about wound care and telephone numbers of the ward and operating theatre nurses.

### Table 4.23  Post-operative pain attributed to

<table>
<thead>
<tr>
<th>Attribute pain rating to</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The incision mainly</td>
<td>6</td>
<td>15.4</td>
<td>24</td>
<td>27.6</td>
</tr>
<tr>
<td>The procedure mainly</td>
<td>14</td>
<td>35.9</td>
<td>21</td>
<td>24.1</td>
</tr>
<tr>
<td>Both about equally</td>
<td>7</td>
<td>17.9</td>
<td>36</td>
<td>41.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>12</td>
<td>30.8</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### 4.3.4.6  Recovery of patients who had laparoscopic surgery

As shown in Table 4.24, patients having laparoscopic surgery recovered faster according to 28 (71.8%) theatre nurses and 72 (82.8%) ward nurses whilst 10 (25.6%) theatre nurses and 6 (6.9%) ward nurses indicated they did not know. The respondents attributed the recovery rate to small incision, early ambulation and no sepsis. Perrin and Fletcher (2004:107-110), state that recovery after laparoscopic procedures is generally more rapid than after open surgery. Pulmonary function is better preserved and due to less atelectasis gas exchange being good. Although patients do feel shoulder tip pain
and discomfort it is only for a short period. There is a reduction in the incidence of post-operative paralytic ileus and quicker mobilisation and therefore a shorter hospital stay and earlier return to work.

**Table 4.24 Recovery of patients**

<table>
<thead>
<tr>
<th>Recovery of patients</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Faster</td>
<td>28</td>
<td>71.8</td>
<td>72</td>
<td>82.8</td>
</tr>
<tr>
<td>The same</td>
<td>1</td>
<td>2.6</td>
<td>9</td>
<td>10.3</td>
</tr>
<tr>
<td>More slowly</td>
<td>10</td>
<td>25.6</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**4.3.4.7 Discharge of patients**

The majority of the respondents, 27 (69.2%) theatre nurses and 71 (81.6%) ward nurses affirmed that patients undergoing laparoscopic surgery were discharged sooner as illustrated in Figure 4.22 and Table 4.25. Laparoscopic surgery has several advantages over open surgery and with smaller incisions it is less traumatic to the body. The length of stay after a laparoscopic procedure is of a shorter duration when comparing it to open surgery. Post-operative paralytic ileus which is defined as a decrease in or absence of intestinal peristalsis is also of shorter duration (Johnson & Walsh 2009). The 12 (30.8%) theatre nurses who professed not to know could be due to them not being in the wards where patients were discharged and the 6 (6.9%) ward nurses who did not know could be attributed to lack of knowledge.

**Table 4.25 Discharge of patients**

<table>
<thead>
<tr>
<th>Attribute pain rating to</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Sooner</td>
<td>27</td>
<td>69.2</td>
<td>71</td>
<td>81.6</td>
</tr>
<tr>
<td>The same</td>
<td>0</td>
<td>0.0</td>
<td>7</td>
<td>8.1</td>
</tr>
<tr>
<td>Later</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>3.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>12</td>
<td>30.8</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.3.4.8 Infection rate

As analysed in Table 4.26 and Figure 4.23, the response to infection post-laparoscopic surgery indicated that, 26 (66.7%) theatre nurses and 62 (71.3%) ward nurses affirmed that the infection rate was lower whereas 10 (25.6%) theatre nurses and 6 (6.9%) ward nurses did not know whether the infection rate was higher in patients who had laparoscopic surgery which could be due to a lack of knowledge. The respondents reported a lower infection rate to small incision, less trauma to tissues and no scarring. Rothrock (2007:319) asserts that minimal access approach offers less potential for surgical site infections and improved cosmesis.

Table 4.26 Infection rate

<table>
<thead>
<tr>
<th>Infection rate</th>
<th>Theatre nurses (n=39)</th>
<th>Ward nurses (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent (%)</td>
</tr>
<tr>
<td>Higher</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>The same</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Lower</td>
<td>26</td>
<td>66.7</td>
</tr>
<tr>
<td>Do not know</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Figure 4.23 Infection rate

4.3.4.9 Patient education

Table 4.27 and Figure 4.24 revealed that 14 (35.9%) theatre nurses and 9 (10.3%) ward nurses confirmed that health education was given on discharge of the patients whilst 1 (2.6%) theatre nurse indicated it was not necessary. Thirteen (33.3%) theatre nurses and 12 (13.8%) ward nurses did not know.

Responses inquiring about what information is given to patients on discharge were predominantly about the incision and care of the wounds and the prevention of infection. Diet was also mentioned including the fact that pain, bleeding and any abnormalities like discharge from the wound should be reported to health staff. Bed rest and the importance of attending follow up clinic and taking medication as prescribed, were emphasised. Rothrock (2007:268) argues that patient and family members should be instructed on the proper care of the wound or incision. They should know how to take temperature and when the physician should be noted for an elevated temperature.
Table 4.27  Patient education

<table>
<thead>
<tr>
<th>Patients educated about care</th>
<th>Theatre nurses (n=39)</th>
<th>Percent (%)</th>
<th>Ward nurses (n=87)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>35.9</td>
<td>60</td>
<td>69.0</td>
</tr>
<tr>
<td>Not necessary</td>
<td>1</td>
<td>2.6</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Done by someone else</td>
<td>10</td>
<td>25.6</td>
<td>9</td>
<td>10.3</td>
</tr>
<tr>
<td>No time</td>
<td>1</td>
<td>2.6</td>
<td>6</td>
<td>6.9</td>
</tr>
<tr>
<td>Do not know</td>
<td>13</td>
<td>33.3</td>
<td>12</td>
<td>13.8</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
<td>87</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Figure 4.24  Patient education**

4.3.4.10  Contact numbers to patients

Respondents were asked if contact numbers on discharge are given to patients and if done whose number is given. Table 4.28 and Figure 4.25 illustrate that 12 (30.8%) theatre nurses and 64 (73.6%) ward nurses affirmed this whilst 21 (53.8%) theatre nurses and 12 (13.8%) ward nurses indicated that they did not know. Theatre nurses are not involved in the discharging of patients. Patients that were provided with contact numbers were given the ward number.
Table 4.28  Contact number provided to patients

<table>
<thead>
<tr>
<th>Contact number provided</th>
<th>Theatre nurses (n=39)</th>
<th>Ward nurses (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent (%)</td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>30.8</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>21</td>
<td>53.8</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Figure 4.25 Contact number provided to patients**

4.3.5 Summary of ward and theatre nurses’ responses

Although the majority of the theatre and ward nurses had between 6 and 16 years experience in nursing, only the theatre nurses rated themselves as knowledgeable about laparoscopic surgery whilst the ward nurses indicated they were reasonably knowledgeable.

With regard to the *pre-operative phase* there was no consensus between the theatre and ward nurses about whether patients were fully informed prior to laparoscopic surgery and the possible conversion to open surgery was not always mentioned in the consent. It is interesting to note that the majority of the ward and theatre nurses would
advise their patients to have their operation done laparoscopically whilst they themselves preferred to have open surgery.

The findings from the *intra-operative phase* show that the majority of theatre nurses had 6 to 10 years of experience in the operating theatre and only two of them had never assisted with laparoscopic surgery whilst the majority had scrubbed for 6 to 16 and more laparoscopic surgeries. The majority of theatre nurses did experience problems occasionally during laparoscopic surgery but they were mentored.

Findings from the *post-operative phase* indicated that there are limitations in the knowledge of both the theatre nurses and the ward nurses with regard to the severeness of complications, rating of post-operative pain, infection rate, recovery rate and education to be given to patients post-operatively.

### 4.4 ANALYSIS OF RESULTS FROM PATIENTS’ QUESTIONNAIRE

#### 4.4.1 Section A: Demographic information of patients

The initial analysis is for the patients’ questionnaire (Annexure G) that was administered personally to the patients. This is followed by the demographic analysis pertaining to the patients’ age, gender and race.

#### 4.4.1.1 Results of the patients’ questionnaire distributed

The patient questionnaire consisted of section A (demographic information) and sections B and C soliciting patients’ knowledge about laparoscopic surgery with regard to the pre-operative and post-operative phases respectively. The total sample for the patients was 42 with 21 patients who answered the questionnaire from each of hospitals A and B (King Edward VIII and Albert Luthuli Hospitals) as illustrated in Figure 4.26.
4.4.1.2 Analysis of age

The majority of respondents 29 (69.1%) were 36 years and older with 10 (23.8%) between 26-35 years and only 3 (7.1%) between 18-25 years of age. The incidence of gall bladder disease increases with age and women who had born several children had gained weight during the aging process. Risk factors include middle age, female gender and northern European, Native American or Hispanic/Latino ancestry (Nursing central 2011). Table 4.29 shows the age distribution of the respondents.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-25 years</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>26-35 years</td>
<td>10</td>
<td>23.8</td>
</tr>
<tr>
<td>36-45 years</td>
<td>8</td>
<td>19.1</td>
</tr>
<tr>
<td>46 and over</td>
<td>21</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

4.4.1.3 Location of hospitals under study

The sample was selected from two government hospitals, namely, King Edward VIII Hospital and Inkosi Albert Luthuli Central Hospital respectively who gave approval to the researcher to conduct the research (Annexure B2 and C2).
4.4.1.4 Analysis of gender

The majority of patients were female 31 (73.8%) whilst males consisted of 11 (26.2%). As laparoscopic cholecystectomies are common procedures it is of note that the incidence of gall stones is higher in females than in males and this may be attributed to, according to Orrange (2010), pregnancy. The sex hormones induce a variety of physiological changes in the biliary system. Oestrogen therapy and oral contraceptives are associated with a higher rate of gall stones.

4.4.1.5 Analysis of race category

The majority of patients were Asian 20 (47.6%) and Black 19 (45.3%) with only 3 (7.1%) being white as annotated in Table 4.30 and Figure 4.27. This analysis could be due to the fact that the hospitals chosen by the researcher was predominantly utilised by Black and Asian people.

Table 4.30 Race distribution of patients (N=42)

<table>
<thead>
<tr>
<th>Race</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>Black</td>
<td>19</td>
<td>45.3</td>
</tr>
<tr>
<td>Asian</td>
<td>20</td>
<td>47.6</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.27 Race distribution of patients
4.4.2 Section B: Pre-operative phase related to patients

Section B included the pre-operative phase (Annexure G) to determine how well the patients were informed prior to the surgery. The analysis pertaining to this section is highlighted hereunder.

4.4.2.1 Patients’ understanding of laparoscopic surgery

As shown in Table 4.31, more than half of the patients, 24 (57.1%), knew something about laparoscopic surgery, 7 (16.7%) patients knew exactly what laparoscopic surgery was whilst 11 (26.2%) patients knew nothing about laparoscopic surgery. This may imply that the consent taken from these patients was not informed. Substantiation was required and those respondents that professed to know something about laparoscopic surgery responded by saying that “smaller incision and camera” should be used. The National Health Act No. 61 of 2003 section 7(3) defines consent as being given by a person with the necessary capacity and who has been informed under section 6(1) which states all health care users must inform the user of the following:

- The user's health status except in circumstances where disclosure of the health status of the patient will be contrary to the best interest of the patient.
- The range of diagnostic procedures and treatment options generally available to the user.
- The benefits, risks, costs and consequences generally associated with each option.
- The users’ right to refuse health services and explain the implications, risks obligations of such refusal (Pera & Van Tonder 2011:73).

Table 4.31 Extent of patients’ knowledge of laparoscopic surgery

<table>
<thead>
<tr>
<th>Know what laparoscopic surgery is?</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know exactly</td>
<td>7</td>
<td>16.7</td>
</tr>
<tr>
<td>Know something</td>
<td>24</td>
<td>57.1</td>
</tr>
<tr>
<td>Know nothing</td>
<td>11</td>
<td>26.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
### 4.4.2.2 Informed consent

Respondents provided information on how well they were informed about laparoscopic surgery prior to the surgery. When asked if the laparoscopic surgery was explained to them by the doctor, 38 (90.5%) patients affirmed that sufficient or some information was given to them by the doctor and only 4 (9.5%) received no information at all as illustrated in Table 4.32 and Figure 4.28.

#### Table 4.32 Laparoscopic surgery explained to patients

<table>
<thead>
<tr>
<th>Laparoscopic surgery explained</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sufficient information</td>
<td>18</td>
<td>42.9</td>
</tr>
<tr>
<td>Some information</td>
<td>20</td>
<td>47.6</td>
</tr>
<tr>
<td>No information</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

![Knowledge about laparoscopic surgery](image)

**Figure 4.28 Laparoscopic surgery explained to patients**

#### 4.4.2.3 Information provided to patients on laparoscopic surgery

The patients were asked whether they were given the option to change their minds on whether they wanted to continue with the laparoscopic approach. In this regard, 32 (76.2%) patients indicated they were not given that option therefore depriving them of the principle of autonomy which is their right as shown in Table 4.33. Autonomy
according to Pera and Van Tonder (2011:70), is an ethical principle that respects the ability of mentally competent persons to make decisions about and for themselves.

All the respondents 42 (100%) indicated that the doctor explained the procedure verbally to them. As shown in Table 4.33 only half of the respondents, 22 (52.4%), indicated that the doctor outlined the complications/risks involved in laparoscopic surgery. The complications mentioned by the respondents were bleeding, possible damage to other organs and possible conversion to open surgery.

Rothrock (2007:205) affirms that excessive bleeding may occur resulting in hypotension. Damage to organs according to Jones and Soper (2004:90), is the appearance of bowel contents seen coming through the trocar which is indicative of trocar injuries which is also a complication.

Shoulder and neck pain is common in patients having laparoscopic surgery due to the retention of carbon dioxide into the abdomen. Such type of pain is also known as gas pain. The pain is felt initially underneath the abdomen and then it moves up to the shoulder. The pain although transient in most cases, can appear after several months after the surgery (Sengupta 2012).

With regard to whether the doctor discussed the advantages of laparoscopic surgery with the patients, 34 (81%) patients reported that the doctors did not discuss the advantages of laparoscopic surgery to them ascertaining an uninformed consent (Table 4.33). The 8 (19%) patients who responded in the affirmative, stated that with regard to the advantages they were made aware of the small cut, safeness of the procedure, quick healing, less pain and short hospital stay when having laparoscopic surgery. Rothrock (2007:184) reports less post-operative discomfort because of the small incision, earlier resumption of oral intake, faster recovery of pulmonary function, fewer post-operative complications, less potential for surgical site infections, improved cosmesis, shorter recovery period and quicker return to former activities of daily living.

Patients were asked whether the information given to them was sufficient to enable them to make an informed decision as to whether they wanted the operation to be done laparoscopically and they had to indicate what other information they would have liked to have. Although 27 (64.3%) patients as illustrated in Table 4.33, felt that the
information given by the doctor was sufficient to make an informed consent, 15 (35.7%) patients disagreed. They clarified this statement by stating that the doctor needed to explain the procedure, the post-operative care after surgery, the dangers and the advantages of laparoscopic surgery which Pera and Van Tonder (2011:73) emphasise is mandatory for all health workers.

Table 4.33 Information provided to patients on laparoscopic surgery

<table>
<thead>
<tr>
<th>Information on laparoscopic surgery</th>
<th>Yes</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>No</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 8 Option to change your mind</td>
<td>10</td>
<td>23.8</td>
<td></td>
<td>32</td>
<td>76.2</td>
<td></td>
</tr>
<tr>
<td>Q 10 Complications outlined</td>
<td>22</td>
<td>52.4</td>
<td></td>
<td>20</td>
<td>47.6</td>
<td></td>
</tr>
<tr>
<td>Q 12 Advantages discussed</td>
<td>8</td>
<td>19.0</td>
<td></td>
<td>34</td>
<td>81.0</td>
<td></td>
</tr>
<tr>
<td>Q 16 Information sufficient</td>
<td>27</td>
<td>64.3</td>
<td></td>
<td>15</td>
<td>35.7</td>
<td></td>
</tr>
</tbody>
</table>

4.4.2.4 Patient’s views on nurses’ knowledge about laparoscopic surgery

As shown in Table 4.34, only 7 (16.5%) patients affirmed that the doctor’s information was reinforced by the nurse whilst the majority, 35 (83.3%) patients stated it was not explained. Pera and Van Tonder (2011:79) contend that the responsibilities of the nurse during consent taking is that he/she must ensure that all criteria for autonomous decision making are met before the patient signs the consent and that witnessing a consent constitutes accountability on the part of the nurse. Accountability has to do with justifying actions by understanding the reasons for them and their possible consequences. One also needs to take into account that if the patient is not informed legally it is the duty of the nurse to ensure it is done.

Table 4.34 Reinforced information by the nurse

<table>
<thead>
<tr>
<th>Information reinforced by nurse</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>16.7</td>
</tr>
<tr>
<td>No</td>
<td>35</td>
<td>83.3</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.4.2.5 Patients’ perceptions on why nurses did not reinforce information

Patients were requested to indicate why the nurse did not reinforce the doctor’s information. As analysed in Table 4.35 and Figure 4.29, the majority of the patients 24 (57.1%), stated that the doctors did not consult with the nurses about reinforcement of knowledge due to the doctor’s assumption of the role of the nurse during consent taking. A survey carried out by Johnson (2009) on doctor-nurse behavior found that respondents complained of the fundamental lack of respect between doctors and nurses and that the physicians continuously questioned the nurse’s intelligence and sometimes labeled them as being “stupid”.

Six (14.3%) patients indicated they did not know why nurses did not reinforce the information regarding laparoscopic surgery. Five (11.9%) patients felt that the nurse did not have time to reinforce the information due to the possible workload whilst seven (16.7%) patients did not respond to the question (Table 4.35). According to the Canadian Federation of Nurse Unions (CPNU), hospitals across the country are over capacity. A generally accepted standard of safe hospital occupancy is 85% but most hospitals are working at 100% or higher resulting in compromised care, high rates of hospital acquired infections and unnecessary re-admissions. Another problem is dangerous levels of workload and the resulting circle of working with a shortage of staff (Berry & Curry 2012:7).

Table 4.35 Patients’ perceptions on why nurses did not reinforce information

<table>
<thead>
<tr>
<th>Reasons why not</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was not consulted</td>
<td>24</td>
<td>57.1</td>
</tr>
<tr>
<td>Did not have time</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>Did not know</td>
<td>6</td>
<td>14.3</td>
</tr>
<tr>
<td>No response</td>
<td>7</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
4.4.2.6 Patients’ reasons for choosing laparoscopic surgery

As shown in Table 4.36, when patients were asked why they agreed to have the operation done laparoscopically, 18 (42.8%) patients indicated that the doctors knew best whilst 11 (26.2%) patients confirmed that it was their own choice or they wanted relief no matter what. Nurses are advocates for their patients and therefore it is the nurse’s duty to make the patient aware of all options and the possible outcomes of each option and if the patient is afraid or needs support, the nurse is obliged to intervene (Pera & Van Tonder 2011:79).

Table 4.36 Reasons for choosing laparoscopic surgery

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own choice</td>
<td>11</td>
<td>26.2</td>
</tr>
<tr>
<td>Doctor knows best</td>
<td>18</td>
<td>42.8</td>
</tr>
<tr>
<td>Afraid of the doctor</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>Wanted relief, no matter what</td>
<td>11</td>
<td>26.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Figure 4.30 illustrates that the eleven patients who affirmed that the type of approach used was their own choice substantiated by saying that they were well informed by the surgeon 9 (81.8%) and 2 (18.2%) professed to know the procedure.
4.4.2.7 Safeness of laparoscopic surgery

As shown in Table 4.37 and Figure 4.31 twenty seven (64.3%) patients did not know whether laparoscopic surgery was safe or not and substantiated their response by saying that the procedure was not explained to them and that they had never experienced this type of incision before. The 14 (33.3%) patients who indicated that laparoscopic surgery was safe, substantiated by stating that they had experienced the procedure before and that there were no complications and some took other patients’ advice and went for the procedure. One (2.4%) patient who felt that laparoscopic surgery was unsafe substantiated this response by stating that a lot of risks were taken with subsequent trauma to organs. Fegade, Yawal and Jalgaon (2008:47) conclude that laparoscopic appendectomy as well as laparoscopic hernia repair, are safe and could provide less postoperative morbidity in experienced hands and definitely have more advantages than open surgery, with regard to morbidity and mortality. Mamidanna, Burns, Bottle, Aylin, Stonell, Hanna and Fiaz (2012:219-227) conducted a study on reduced risk of medical mortality and morbidity in patients selected for laparoscopic colorectal resection in England. The study concluded that the patients selected for laparoscopic colorectal resection were associated with a lower risk of mortality as well as reduced cardio-respiratory and venous thromboembolic risk than those undergoing open surgery and this suggested that laparoscopic surgery was relatively safe.
Table 4.37  Safeness of laparoscopic surgery

<table>
<thead>
<tr>
<th>View of laparoscopic surgery</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe</td>
<td>14</td>
<td>33.3</td>
</tr>
<tr>
<td>Unsafe</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>27</td>
<td>64.3</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.31  Safeness of laparoscopic surgery

4.4.3  Section C:  Post-operative phase related to patients

Section C explored what knowledge patients had about the post-operative phase after laparoscopic surgery. The results for this section are analysed hereunder.

4.4.3.1  Complications after laparoscopic surgery

As shown in the analysis in Table 4.38 when asked whether the complications would be different as compared to open surgery, 25 (59.5%) patients said yes and 17 (40.5%) patients said no. Those who expected different complications stated that with open surgery there was clear visualisation of the organs unlike in laparoscopic surgery where one has to see through a camera and some said that the degree of pain would be different. Most of the 17 (40.5%) respondents who indicated they did not expect different complications reported that they did not know if there was a difference because it was not explained to them by the nurse due to the nurse’s lack of knowledge.
Table 4.38  Comparison of complications of laparoscopic versus open surgery

<table>
<thead>
<tr>
<th>Comparison: complications of laparoscopic versus open surgery</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different</td>
<td>25</td>
<td>59.5</td>
</tr>
<tr>
<td>Same</td>
<td>17</td>
<td>40.5</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.4.3.2  Severity of complications

Patients were asked if they expected the complications for laparoscopic surgery to be worse than open surgery. As shown in Table 4.39 and Figure 4.32, 30 (71.4%) patients felt that it would be less severe, 7 (16.7%) thought it would be the same severity and 3 (7.1%) patients felt that the complications would be of a worse severity especially if the incision was small and problems arose. Rothrock (2007:318) agrees with those respondents who indicated that the complications would be less, because patients undergoing laparoscopic surgery report less post-operative discomfort due to the small incision, although muscle discomfort can be experienced due to the manipulation of instruments. Further, bowel movement may occur one day earlier than after open surgery, faster recovery of pulmonary function is expected, fewer post-operative complications occur, and there is less potential for surgical site infections. Recovery time is shorter and quicker return to daily activities is possible. Some patients acknowledged that they did not know if they were informed during the signing of their consent. This has some degree of contradiction as uninformed consent may be construed as disrespectful to the patient in terms of autonomy.

Table 4.39  Severity of complications

<table>
<thead>
<tr>
<th>Complications worse</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More severe</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>The same severity</td>
<td>7</td>
<td>16.7</td>
</tr>
<tr>
<td>Less severe</td>
<td>30</td>
<td>71.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.4.3.3 Intensity of pain

Patients were asked if they expected more pain after laparoscopic surgery. As shown in Table 4.40, 36 (85.7%) patients were sure that the pain post-operatively would be less because of the small incision and only 1 (2.4%) patient expected more pain. The 4 (9.5%) patients who reported the pain would be no different, assumed it to be the same because of the lack of explanation by the doctor and their lack of knowledge of the procedure.

Table 4.40 Intensity of pain after laparoscopic surgery compared to open surgery

<table>
<thead>
<tr>
<th>Intensity of pain after laparoscopic surgery</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Same</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>Less</td>
<td>36</td>
<td>85.7</td>
</tr>
<tr>
<td>Do not know</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.4.3.4 Severity of bleeding

As depicted in Table 4.41 and Figure 4.33, 32 (76.2%) respondents reported that they
expected to experience less bleeding post-laparoscopic surgery as compared to open surgery while 6 (14.3%) patients indicated that bleeding would be the same, 2 (4.7%) patients did not know and 2 (4.7%) patients expected more bleeding. It was reported in a study that during laparoscopic surgery, blood loss was less, hence, a decreased need for blood transfusion. Kaushik (2010:59-65) and Schoenstadt (2006) affirms that bleeding would be present but minimal.

Table 4.41 Severity of bleeding

<table>
<thead>
<tr>
<th>More bleeding afterwards</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>Same</td>
<td>6</td>
<td>14.3</td>
</tr>
<tr>
<td>Less</td>
<td>32</td>
<td>76.2</td>
</tr>
<tr>
<td>Do not know</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.33 Severity of bleeding

4.4.3.5 Damage to organs

Respondents had to indicate whether they thought there would be more damage to other organs during laparoscopic surgery as opposed to open surgery. As shown in Table 4.42 and Figure 4.34, the majority of patients, 30 (71.4%), felt that less damage would be caused to organs during laparoscopic surgery. Five (11.9%) patients answered that damage to organs would be more. A further 5 (11.9%) patients said damage would be the same as compared to open surgery and 2 (4.8%) did not know
giving the researcher the impression that respondents were not adequately informed. Schoenstadt (2008) states that because of the nature of the laparoscopic surgery, organ injuries are rare but if injuries do occur and are detected during the operation, the repair is done immediately and the wound heals but if detected after the operation another surgery may be performed to repair the damage.

Table 4.42 Damage to organs

<table>
<thead>
<tr>
<th>More damage to organs</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>Same</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>Less</td>
<td>30</td>
<td>71.4</td>
</tr>
<tr>
<td>Do not know</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

![Figure 4.34 Injury to organs](image)

4.4.3.6 Awareness of neck and shoulder pain

As shown in Table 4.43, highlights whether the doctor informed patients that they may experience muscle pain in the neck and shoulder after the procedure and 40 (95.2%) patients responded in the negative.

It is alarming to note that only 2 (4.8%) patients claimed they knew about the possibility of neck and shoulder pains. The phrenic nerve is shared by the diaphragm and the shoulder and when the carbon dioxide irritates the diaphragmatic nerves, pain is
referred upwards through the nerve connection aggravating the shoulder (Sengupta 2012).

Table 4.43 Awareness of neck and shoulder pain (N=42)

<table>
<thead>
<tr>
<th>More neck and shoulder pain</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>No</td>
<td>40</td>
<td>95.2</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.4.3.7 Recovery after laparoscopic surgery

Respondents were asked if they felt that they were going to recover faster after laparoscopic surgery compared to open surgery and they had to substantiate. As illustrated in Table 4.44 and Figure 4.35, 33 (78.6%) patients agreed that recovery after laparoscopic surgery would be faster because of the smaller incisions whilst 5 (11.9%) patients assumed that recovery would be the same as for open surgery, 3 (7.1%) patients said more slowly and 1 (2.4%) did not know. This confirms the inadequate knowledge that some patients have and the poor imparting of knowledge by the doctor and the nurse. Rothrock (2007:319) reports a shorter recovery period, earlier resumption of oral intake and quicker return to former activities of daily living after laparoscopic surgery. Velanovich (2000:16-21) affirms that laparoscopic surgery has demonstrably better quality of life outcomes than open surgery for cholecystectomy, splenectomy and oesophageal surgery.

Table 4.44 Recovery rate

<table>
<thead>
<tr>
<th>Recovery</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster</td>
<td>33</td>
<td>78.6</td>
</tr>
<tr>
<td>The same</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>More slowly</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>Do not know</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.4.3.8 Resumption of normal activities

When asked about how soon the patient would be able to resume normal activities, the responses ranged from 2 days to 3 months. Wasowicz, Slootmaker, Kemps, Borel-Rinkes, Biesma and Van Ramshorst (2009:2034-2040), conducted a study with the aim to objectively assess daily physical activity after day case laparoscopic cholecystectomy and to evaluate the effect of encouragement of patients. It was concluded that the daily physical activity exceeded one week in most patients undergoing day case laparoscopic cholecystectomy.

4.4.3.9 Aftercare post-laparoscopic surgery

Patients were asked what aftercare information was given to them. Only 6 (14.3%) patients acknowledged that the nurse did give after care information, whereas 36 (85.7%) patients denied that any information was given to them about aftercare. Those who were given aftercare information were advised not to drive, not to do hard work, to change lifestyles and to take vitamins, and to ensure that help is available at home. They were advised not to stretch the arm, not to jump out of bed, not to carry heavy stuff and to rest for 6 weeks. Aftercare information is mandatory post-operatively to ensure that patients care for their wounds appropriately when at home and more especially to reduce the risk of infection.
4.4.3.10 Coping after discharge

Thirty seven (88.1%) patients felt confident of coping after being discharged although 5 (11.9%) patients were not sure. This was a close ended question and no substantiation was required but the reason given by the majority of respondents stated that they would cope as the incision was small and therefore would experience less pain and discomfort. The results are shown in Table 4.45 and Figure 4.36.

Table 4.45 Coping after discharge

<table>
<thead>
<tr>
<th>Confident of coping</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>37</td>
<td>88.1</td>
</tr>
<tr>
<td>Not sure</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.36 Coping after discharge

4.4.4 Summary of patients’ questionnaire responses

The majority of the patients were between 36 and 46 years and over and mainly females. The findings from the pre-operative phase indicate that only 7 (16.7%) of the 42 patients knew moderately what laparoscopic surgery was and slightly more than half of them received sufficient information about laparoscopic surgery from their doctors. Half of the patients received information about the complications and risks involved and the majority of the patients indicated the advantages were not discussed with them.
One third of the patients said the information they received was not sufficient to enable them to make an informed decision to choose laparoscopic surgery. The majority of patients stated that the nurse witnessing the consent was not able to reinforce the information given by the doctor. The reasons cited were that the nurse was not fully knowledgeable as indicated by the majority of patients, whereas some patients indicated conversely that the nurse did not know and the nurse did not have the requisite time. The majority of patients also did not know whether laparoscopic surgery was a safe procedure.

The findings from the post-operative phase showed that the majority of the patients expected different and less severe complications, less pain and bleeding, less damage to their organs and a faster recovery. The patients were not informed about post-operative neck and shoulder pain as a result of the insufflation of CO\textsubscript{2} during the surgery. Patients were confident that they would be able to cope after being discharged from the hospital. However, the majority of the patients did not receive any after care information from the nurses.

4.5 CONCLUSION

Data collection was done by the distribution of questionnaires by hand to the theatre nurses, ward nurses and patients. This resulted in an excellent response rate from both categories of respondents. The questionnaire results for the nurses group and the patients were discussed separately. Knowledge about laparoscopic surgery varied amongst the theatre and the ward nurses with both professing to be reasonably knowledgeable about laparoscopic surgery. However, specific limitations in the nurses’ knowledge were identified. The majority of patients indicated that they knew something about the operation although they did not know much about the advantages and the complications of laparoscopic surgery and they were not adequately informed to be able to sign informed consent.

The summary of main findings, conclusion and recommendations of the study are presented in the next chapter.
CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The research undertaken highlighted important and interesting insights into the nurses’ and patients’ knowledge and understanding of laparoscopic surgery conducted at the two Government hospitals in KwaZulu-Natal. This chapter presents a summary of the findings, conclusion and recommendations for top management of the two hospitals concerned. Recommendations pertaining to nursing and future research are also proposed. The purpose of this study was also to determine whether nurses were sufficiently knowledgeable to disseminate adequate information about laparoscopic surgery to patients. The preliminary summary of the findings are initially discussed according to the objectives of the study followed by the conclusion and the tentative recommendations made.

5.2 SUMMARY

Objective 1: Identify operating theatre and ward nurses’ knowledge and understanding about laparoscopic surgery

The majority of nurses were females and between 26-46 years of age, and the majority of both the theatre and ward nurses had between 6-16 years and more experience in nursing. Slightly more than half of the ward and theatre nurses were knowledgeable and very knowledgeable about laparoscopic surgery.

The majority of ward nurses thought that patients were well informed about laparoscopic surgery whilst most theatre nurses thought that only some patients were well informed as they received many questions from patients about post-operative complications. The theatre nurses mentioned the post-operative complications whereas the ward nurses did not mention any complications.
Only a few nurses (less theatre nurses than ward nurses), regarded laparoscopic surgery as safe. The majority of the nurses indicated it as unsafe as a result of the possible complications which may occur during surgery. The majority of nurses would advise patients to choose laparoscopic surgery whereas they themselves preferred open surgery. This is disconcerting as mixed signals are given to the patients which may lead to anxiety.

The majority of nurses know about the advantages of laparoscopic surgery indicating that there were less complications, less infection of the surgical site, improved cosmesis and a shorter recovery period.

All the theatre nurses agreed that the consent should include conversion to open surgery, but only 71% of the ward nurses thought this was necessary and yet it was the ward nurses who witnessed patients signing consent for the surgical procedure and they were under the impression that patients were well informed about laparoscopic surgery.

Regarding the importance of preoperative hydration the majority of ward nurses stated that all or some patients needed hydration but 25.6% theatre nurses indicated they did not know whether hydration was essential for the patients.

Most of the theatre nurses had 6-16 years and more experience in theatre and had assisted with between 6 and more than 16 laparoscopic surgeries. All except three theatre nurses were mentored in theatre with regard to laparoscopic surgery and less than half of them had the additional Diploma in operating theatre technique.

With regard to the complications of laparoscopic surgery, most ward and theatre nurses expected it to be different and less severe. However, 28.2% of the theatre nurses indicated they did not know.

The theatre nurses generally expected patients to have less pain which was attributed to the procedure mainly whilst the ward nurses attributed it mainly to the incision.

The majority of ward and theatre nurses stated that the infection rate in patients undergoing laparoscopic surgery was lower, but 25.6% theatre nurses indicated they
did not know whether the infection rate was higher or lower thereby underscoring their lack of knowledge about laparoscopic surgery.

The majority of ward nurses educated patients about health care post-laparoscopic surgery, but some said they did not have the time or did not know which is not acceptable as it is their duty to educate patients. Some of the theatre nurses educated patients, but 33.3% said they did not know which is a concern.

Regarding recovery and discharge of patients most ward and theatre nurses indicated that they recovered faster and were discharged sooner. However, 30.8% theatre nurses did not know if patients were discharged sooner and 25.6% theatre nurses did not know if patients recovered faster.

Objective 2: Establish whether patients were adequately informed pre-operatively about laparoscopic surgery.

The majority of patients who answered the questionnaire were 46 years of age and over although the age ranged from 18 to 46 years of age and over, there were more females and predominantly Black and Asian.

A marginal number of respondents had no knowledge at all about laparoscopic surgery. Although the majority of the patients did affirm that some information was given to them. Most of the patients denied being offered an option to change their mind about the surgical approach thus infringing on their autonomy.

It was ascertained that only half of the patients were aware of the complications/risks involved in laparoscopic surgery and just below half were not aware at all about the complications/risks involved in laparoscopic surgery. Furthermore, almost all the patients were ignorant of the possibility of shoulder and neck pain being a complication.

When it came to discussing the advantages of laparoscopic surgery by the doctor, the majority of patients denied this discussion took place, although a few patients acknowledged themselves having this discussion. It was ascertained that the majority of patients indicated that the information given by the doctor was sufficient to make an informed consent whilst a few patients needed more clarification.
It became quite clear that according to the majority of patients the poor reinforcement of the information given by the nurse was due to the fact that they were not consulted. However, a moderate percentage of patients attributed this poor reinforcement of information to the lack of knowledge by the nurse.

According to less than half of the patients, the choice of the surgical approach depended on what the surgeon felt was in the best interest of the patient, although some patients responded that it was their choice and that they needed relief no matter what complications could have arisen. Those patients who admitted that it was their own choice were confident about the information given to them on laparoscopic surgery and a few patients professed to know the procedure. A very small percentage of the patients admitted to being afraid of the doctor.

On discussing how safe laparoscopic surgery was a minority of patients were confident that it was safe whilst the majority of the respondents were uncertain whether laparoscopic surgery was safe and only one patient was adamant that this type of surgery was unsafe.

Objective 3: Determine patients' knowledge and understanding of laparoscopic surgery

Patients were asked if complications differed when comparing laparoscopic surgery to open surgery and more than half of the respondents supported this statement. A small minority of the patients disagreed stating that it was the same.

Despite the majority of the patients acknowledging that the severity of the complications would manifest less in laparoscopic surgery a few stated that it could be worse and some had no idea whatsoever.

The majority of patients were satisfied that the pain, bleeding and injury to organs would be less although the possibility of neck and shoulder pain, which is common following laparoscopic surgery or following gas insertion was not known to almost all of the patients. Patient education is therefore essential to reduce anxiety and empower patients to take care of themselves after surgery.
Most patients stated that recovery post-operatively was faster whilst a minority indicated that it would be the same as per open surgery and slower. Some respondents, in this regard, did not even know indicating a lack of knowledge.

Most patients denied receiving after care information post-laparoscopic surgery whilst only a minority acknowledged that they were provided with after care information. This is unacceptable as post-care contributes greatly towards recovery and wellness. The majority of patients were confident that they would cope post-laparoscopic surgery on discharge although a few were not sure.

5.3 CONCLUSION

Although most of the ward and theatre nurses in this study were mature in age and have been in nursing for a considerable number of years, it is a concern to note that only about half of them were knowledgeable about laparoscopic surgery, especially in view of the fact that laparoscopic surgery was introduced in South Africa during the early 1990s and that it has since become a very popular type of surgery. The following is a brief summation of the findings from the study:

The ward nurses’ lack of knowledge about the specific post-operative complications of laparoscopic surgery was another concern as they were the ones who had to care for these patients post-operatively.

The theatre nurses were better informed than the ward nurses about the intra-operative complications of laparoscopic surgery but both the theatre and ward nurses did not perceive it as safe. Although they were aware of the advantages of laparoscopic surgery, they still preferred open surgery themselves. This could possibly be attributed to the fact that they were afraid of the many possible intra-operative complications due to the instrumentation and also of advanced technology.

From the empirical analysis it was apparent that patients were not well informed about laparoscopic surgery with specific reference to the post-operative complications. It is the doctor’s prerogative to inform patients about post-operative complications of surgery but if the nurses were being constantly questioned by patients, then they should have the necessary knowledge to inform patients accordingly. Most patients denied receiving
after care information post-laparoscopic surgery, whilst only a minority acknowledged that they were provided with after care information. This is not acceptable as post-care contributes greatly towards quick recovery and wellness. The majority of patients were confident that they would cope with post-laparoscopic surgery on discharge although a few were not sure.

It was also noted that the ward nurses indicated that pre-operative hydration was important as compared to theatre nurses who did not know. Theatre nurses also showed a lack of knowledge with regard to the severity of post-operative complications and infection rate as well as the recovery rate and required patient education to be given post-operatively on discharge of the patient.

Another factor that needs attention is the inclusion of the conversion to open surgery in the consent which theatre nurses felt was important but the ward nurses had an opposing view. Consent for operations are taken in the wards and therefore this inclusion should be added in the consent form before the patient goes to the theatre and the exclusion thereof could result in litigation both to the hospital and the health professional(s) involved (vicarious liability). Vicarious liability is relevant when a patient or client suffered any loss or injury through the negligence or incompetence of a member of the staff or through willful wrongdoing by one of the members of the staff in the performance of his/her duty. In addition, the health authority concerned is liable to compensate the injured party if such injury is proved irrespective if the loss or injury was due to incompetence, carelessness or poor supervision. The injured party can also sue the person who caused the injury for damage and loss. This is termed vicarious liability (Searle, Human & Mogotlane 2011:310).

The results from this study revealed that the professional nurses who participated in this study were not sufficiently knowledgeable about laparoscopic surgery to give adequate information to patients who had to undergo laparoscopic surgery. The patients themselves did receive information about laparoscopic surgery from their doctors but they were not fully informed about all aspects of laparoscopic surgery including the complications, advantages and after care. Thus, there is scope for improvement of patient education to assist patients to gain optimal recovery. It appears that the health professional team including the doctors and nurses are at times negligent about
informed consent signing in the case of laparoscopic surgery, as the omission of conversion to open surgery is a serious medico-legal issue.

5.4 RECOMMENDATIONS

Arising from the empirical analysis of the results, tentative recommendations are made pertaining to, *inter alia*, knowledge and understanding of laparoscopic surgery by both ward and theatre nurses as well as the patients; nursing and nursing education. The recommendations made are contextualised for this study which involved the two hospitals, namely, King Edward VIII and the Albert Luthuli hospitals in KwaZulu-Natal. These recommendations, therefore, pertain to the target population of these two hospitals. It is further contended that these recommendations cannot be generalised to other hospitals in KwaZulu-Natal as situational factors and other variables may differ. However, other scholars and researchers may find the results valuable as this study has expanded the frontiers of knowledge of laparoscopic surgery pertaining to the ward, theatre nurses and patients. It is important to note that nursing and nursing education are of paramount importance for all parties concerned, namely, ward nurses, theatre nurses, doctors and patients.

- Ward and theatre nurses should be educated about informed consent taking and the legal implications if not taken correctly and the emphasis on their role and responsibilities during consent taking. This could be done during in-service education.

- Theatre nurses should conduct pre-operative visits for patients undergoing laparoscopic surgery so that any questions that patients have may be answered to reinforce the doctors’ information.

- In-service education on laparoscopic surgery must be given to nurses by efficient and skilled doctors as well as experienced nurses.

- Ward nurses caring for patients undergoing laparoscopic surgery should be allowed to watch these procedures in theatre so that learning takes place at coal face therefore improving quality and holistic care that could be given to the patients.
• The manufacturers of the instrumentation of laparoscopic surgeries should be invited by hospital management to offer workshops in these Hospitals and the target group should be the ward nurses and theatre nurses. This will improve and enhance the knowledge and understanding that both the ward and the theatre nurses lack. In order to be a good scrub nurse and to anticipate the surgeon’s actions, theatre nurses need to be knowledgeable about the procedure and more so during laparoscopic surgery where knowledge of instrumentation is crucial.

• Theatre nurses should also be knowledgeable about the post-operative management of the patient including the health education given on discharge and provision of contact numbers – this type of information can be included in in-service education sessions.

• Clinical nurse conferences can be arranged in surgical wards by the nursing staff during which patients who had laparoscopic surgery are discussed. This could lead to a better understanding of the needs of the patients and after care.

• Discussions can be arranged in surgical wards where nurses are requested to find journal articles on laparoscopic surgery and then discuss and share the information with colleagues. Brainstorming their experiences and engaging in robust debates would add value in health care of the patients.

• Laparoscopic surgery is part of endoscopic surgery and therefore part of the curriculum as specialised surgery in the Diploma in Operating Theatre Technique nursing science course which is offered as a post-registration course. However, it also needs to be added to the basic Diploma in General Nursing, Midwifery, Psychiatric Nursing and Community Health because nurses who render health care to these patients and scrub for laparoscopic surgery may not be specially trained and therefore need knowledge pertaining to laparoscopic surgery.

• Health education pamphlets for patients receiving laparoscopic surgery can be prepared by nurses with the approval of the chief nurse manager and doctors’ approval.
5.5 DIRECTIONS FOR FUTHER RESEARCH

The research revealed some important findings which were also aligned to other studies into the nurses’ and patients’ knowledge and understanding of laparoscopic surgery conducted at the two Government hospitals in KwaZulu-Natal. This study has the potential to add value to other hospitals involved in laparoscopic surgery. Private hospitals or institutions need to involve themselves in similar research studies as well to provide comparable empirical perspectives in the field of laparoscopic surgery. Further research needs to be done on pain management post-laparoscopic surgery and robotic surgery. Future research can also look at post-basic nursing qualifications with the intention of including courses that are relevant to laparoscopic surgery. Further research in this domain could also examine the degree of complications and the need for after care post-laparoscopic surgery.

5.6 LIMITATIONS OF THE STUDY

Only two government hospitals were included in this research and no private hospitals which prevents the findings being generalised to other hospitals in the province or other provinces in South Africa.

Although non-probability sampling places a much greater burden of judgment on the researcher it was the ideal method for this study. The findings cannot be generalised as random sampling was not done but the results and recommendations of the study are relevant to create awareness amongst health professionals in other contexts about possible shortfalls with regard to laparoscopic surgery.


To whom it may concern
Department of Health
Pietermaritzburg

Re: Permission to conduct a Research Project from the
Department of Health

I Mrs. PD Bhagirathee, a lecturer teaching Operating Theatre Nursing Science at
the King Edward viii Campus hereby request permission to conduct a research
project “Patients and nurses knowledge and understanding regarding
laparoscopic surgery”. This study is a requirement for the MA Cur at the
University of South Africa

The benefits of this study is that once the nurses’ and patients’ knowledge and
understanding of laparoscopic surgery is determined, recommendations could be
made for improving the nurses’ knowledge resulting in them being better
prepared to give adequate information to patients. This could lead to better
informed patients who would be able to make informed decisions as to whether
they want to have a laparoscopic procedure being performed rather than
traditional open surgery.

I would indeed be grateful if you can give me a letter of approval to hand over to
the institutions namely King Edward viii Hospital and Inkosi Albert Luthuli Central
Hospital so that approval from these institutions is secured. I have enclosed the
ethical clearance certificate obtained from the University, Research Proposal
, Provisional Approval from the institutions and the questionnaire which includes
the nurses and the patients.

A copy of the report will be sent to your department.

Hoping my request will receive your keenest consideration

Yours faithfully

PD. BHAGIRATHEE
To whom it may concern  
Department of Health  
Pietermaritzburg

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the nurses and the patients.

A copy of the report will be sent to your department.

Hoping my request will receive your keenest consideration

Yours faithfully

[Signature]

PD.BHAGIRATHEE
Dr. Baloyi
King Edward viii Hospital
Private Bag X02
Congella
4013

Re: Permission to conduct a Research Project at the King Edward viii Hospital from March to August 2011

I Mrs. PD Bhagirathie, a lecturer teaching Operating Theatre Nursing Science at the King Edward viii Campus hereby request permission to conduct a research project "Patients and nurses knowledge and understanding regarding laparoscopic surgery" in your institution. This study is a requirement for the MA in Health Studies at the University of South Africa.

The purpose of this study is to establish patients' knowledge and understanding of laparoscopic surgery and to determine whether operating theatre and surgical ward nurses have sufficient knowledge to provide to patients to enable them to give informed consent for this surgical procedure.

The benefits of this study to your institution is that once the nurses' and patients' knowledge and understanding of laparoscopic surgery is determined, recommendations could be made for improving the nurses' knowledge resulting in them being better prepared to give adequate information to patients. This could lead to better informed patients who would be able to make informed decisions as to whether they want to have a laparoscopic procedure being performed rather than traditional open surgery.

Please be assured that this research study has no financial implications to the institution.

I would indeed be grateful if you can give me a letter of approval to hand over to the Department of Health so that approval from the Department is secured. I have enclosed the ethical clearance certificate obtained from the University.

Hoping my request will receive your keenest consideration

PD.BHAGIRATHEE
DECLARATION

I declare that the research Study “Patients’ and nurses’ Knowledge and understanding of Laparoscopic Surgery” is my own work and that all the sources used or quoted have been indicated and acknowledged by means of complete references and that this work has never been submitted for any other degree at any other institution.

PRAVINA DEVI BHAGIRATHEE (MRS)
STUDENT NO. 3057 278 9

20 FEBRUARY 2013
DATE
Dear Mrs Baghirathee

Subject: Approval of a Research Proposal

1. The research proposal titled Patients' and Nurses' knowledge and understanding of laparoscopic surgery was reviewed by the KwaZulu-Natal Department of Health.

   The proposal is hereby approved for research to be undertaken at King Edward VIII and Inkosi Albert Luthuli Hospitals.

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 hrmk@kznhealth.gov.za

For any additional information please contact Mrs G Khumalo on 033-3953189.

Yours Sincerely

Mrs E Snyman
Interim Chairperson, Health Research Committee
KwaZulu-Natal Department of Health
Date: 17/03/2011
1 March 2011

Mrs P D Bhagirathee
DOTT Lecturer
K.E.H.

Dear Ms Bhagirathee

RE: PERMISSION TO CONDUCT RESEARCH AT IALCH

I have pleasure in informing you that permission has been granted to you by the Medical Manager to conduct research on: Patients and nurse’s knowledge and understanding of laparoscopic surgery.

Kindly take note of the following information before you continue:

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health with regards to this research.
2. This research will only commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department of Health.
3. Kindly ensure that this office is informed before you commence your research.
4. The hospital will not provide any resources for this research.
5. You will be expected to provide feedback once your research is complete to the Medical Manager.

Yours faithfully

Dr M E L Joshua
Medical Manager

Umnyango WezempiIo Departement van Gesondheid
Enq.: Miss. R. Khuzwayo  
Ref.: KE 2/7/1/ (09/2011)  
Research Programming  

3 February 2011

Mrs. PD Bhagirathee  
P.O. Box 30036  
MAYVILLE  
4058

Dear Mrs. Bhagirathee

Protocol: “Patient’s and Nurses’ Knowledge and Understanding of Laparoscopic Surgery“

Permission to conduct research at King Edward VIII Hospital is provisionally granted, pending approval by the Provincial Health Research Committee, KZN Department of Health.

Kindly note the following:-

- The research will only commence once confirmation from the Provincial Health Research Committee in the KZN Department of Health has been received.

- Signing of an indemnity form at Room 8, CEO Complex before commencement with your study.

- King Edward VIII Hospital received full acknowledgment in the study on all Publications and reports and also kindly present a copy of the publication or report on completion.

The Management of King Edward VIII Hospital reserves the right to terminate the permission for the study should circumstances so dictate.

Yours faithfully

______________________________________
DR. OSB BALOYI  
ACTING CEO & MEDICAL MANAGER

[Signature]

DATE: 04/02/2011

uMnyango Wezempilo. Departement van Gesondheid

Fighting Disease, Fighting Poverty, Giving Hope
UNIVERSITY OF SOUTH AFRICA
Health Studies Research & Ethics Committee (HSREC)
Faculty of Human Sciences
CLEARANCE CERTIFICATE

Date of meeting: 2 December 2010       Project No: 3057-278-9

Project Title: Patients’ and nurses’ knowledge and understanding of laparoscopic surgery

Researcher: Pravina Devi Bhagirathee

Supervisor/Promoter: Prof E Potgieter

Joint Supervisor/Joint Promoter: N/A

Department: Health Studies

Degree: Masters in Public Health

DECISION OF COMMITTEE

Approved √    Conditionally Approved    

Prof TR Mavundla
RESEARCH COORDINATOR

Prof MC Bezuidenhout
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES
INFORMED CONSENT TO RESEARCH PARTICIPANTS

I have been asked to be a participant in the research study Laparoscopic surgery: Patients' and nurses' understanding of Laparoscopic surgery I understand that this research is undertaken by Mrs. Pravina Devi Bhagirathee who is doing her Masters degree in Nursing at the department of Health Studies, University of South Africa.

I also understand that since laparoscopic surgery is the current trend in operating theatres it is essential for us, nurses and patients to know about this particular surgery hence the importance of the exploration of our knowledge pertaining to this particular surgery so that we are able to make informed decisions.

The following aspects were explained to me in detail:

- The potential risks and the benefits of the study
- Participation in this study is voluntary
- Anonymity and confidentiality is secured
- The findings of this study may be used in nursing publications or presentations
- I am able to withdraw from the study at any time and will not penalised as a result of this
- I will have access to the findings of the research study
- I will be kept informed about the progress of the study at all times.

I do understand that I have to fill in a questionnaire. I realise that I need to be 18 years and over and be able to speak English to participate. I do accept the fact that the questionnaire according to the researcher will take approximately 10 minutes to complete.

I confirm that the purpose of the research study including the above information has been explained to me fully and that all my questions were answered. I understand that I will be given a copy of this signed consent form.

Signature of Participant       Date

Signature of Researcher        Date
QUESTIONNAIRE FOR NURSES LAPAROSCOPIC SURGERY

INSTRUCTIONS:
Answer all questions
Tick in the box provided
Do not write your name on the questionnaire

QUESTIONNAIRE

SECTION A.
1. Indicate your age
   1.1 [ ] 18 - 25 years
   1.2 [ ] 26 - 35 years
   1.3 [ ] 36 – 45 years
   1.4 [ ] Above 45 years

2. Rank category:
   2.1 [ ] Ward nurse
   2.2 [ ] Theatre nurse

3. Experience as a nurse:
   3.1 [ ] 1- 5 years
   3.2 [ ] 6 -10 years
   3.3 [ ] 11 – 15 years
   3.4 [ ] 16 years and above

4. Location of service:
   4.1 [ ] Ward: Public Hospital
   4.2 [ ] Ward: Private Hospital
   4.3 [ ] Theatre: Public Hospital
   4.4 [ ] Theatre: Private Hospital
5. Gender
5.1 Male
5.2 Female

6. Race
6.1 Black
6.2 Asian
6.3 Coloured
6.4 White
6.5 Other

7. Concerning your knowledge about laparoscopic surgery how would you rate yourself from 1 to 5 with 1 = no knowledge and 5 = very knowledgeable.
7.1 1
7.2 2
7.3 3
7.4 4
7.5 5

SECTION B. Preoperative

8. Would you say that patients are well informed about laparoscopic surgery?
8.1 Yes
8.2 No
8.3 Some are and some are not
8.4 Do not know
9. If your answer to question 8 is No, please explain
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10. If the operation could be done using either the laparoscopic or the open approach, how would you advise the patient to have the operation done.

10.1 Laparoscopically
10.2 Open procedure

11. If you had to have an operation for which laparoscopy is an option, how would you yourself prefer it done.

11.1 Open procedure
11.2 Laparoscopically
11.3 No Preference

12. Give reasons for your answer
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

13. Do you regard laparoscopic surgery as?

13.1 Safe
13.2 Unsafe
13.3 Usually safe, but there might be complications

14. Substantiate your answer
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........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
15. Do you agree that consent for laparoscopic surgery must mention the proposed operation and its possible conversion to open?
15.1 Yes
15.2 No

16. If the answer to question 15 is yes why do you think it is important?
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17. What in your opinion are the advantages of laparoscopic surgery?
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18. Are there any contraindications of laparoscopic surgery and if so what are they
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SECTION C: Intraoperative (only to be answered by theatre nurses) only

19. Experience as a theatre nurse:
19.1 [ ] 1- 5 years
19.2 [ ] 6-10 years
19.3 [ ] 11 – 15 years
19.4 [ ] 16 years and above

20. Whilst scrubbed for a laparoscopic surgery did you encounter any problems?
  20.1 [ ] Never
  20.2 [ ] Occasionally
  20.3 [ ] Frequently
  20.4 [ ] Always

  21. If your answer is frequently or always explain
  ...........................................................................................................................................................
  ...........................................................................................................................................................
  ...........................................................................................................................................................
  ...........................................................................................................................................................
  ...........................................................................................................................................................

22. When you first started scrubbing for laparoscopic surgery were you mentored?
  22.1 [ ] Yes
  22.2 [ ] No

  23. If the answer is yes by whom and if the answer is no, why do you think this has happened.
  ...........................................................................................................................................................
  ...........................................................................................................................................................
  ...........................................................................................................................................................
  ...........................................................................................................................................................
24. Do you have a Diploma in Operating Theatre Technique?
24.1 Yes
24.2 No
25. Have you assisted with laparoscopic surgery previously?
25.1 Yes
25.2 No
27. How many laparoscopic surgeries have you assisted with?
27.1 1 - 5
27.2 6 - 10
27.3 11 - 15
27.4 16 and above
28. How would you describe this assistance?
28.1 Difficult
28.2 Easy but challenging
28.3 Easy
28.4 Does it vary for different surgeons
28.5 Does it become easier over time with experience
29. Give reasons for your answer in question 28 taking handling and utilization of the instrumentation into account
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........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
30. In your opinion does the outcome of a laparoscopic operation depend on the expertise of the surgeon?
30.1 Yes
30.2 No
30.3 [Partially]

31. Please provide a reason for your answer in Question 27.

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………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

32. In your opinion does laparoscopic surgery take longer than open surgery?
32.1 [Longer]
32.2 [same]
32.3 [shorter]

33. Substantiate your answer

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34. Do you think that there is a possibility that the insertion of a veress needle could cause injuries?
34.1 [Yes]
34.2 [No]

35. In your experience, does it happen very often?
35.1 [Yes]
35.2 [No]

36. If your answer to question 35 was yes what are these types of injuries.

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………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
33. From your experience what percentage (%) of cases were conversions to open surgery
37.1 [ ] 0 – 25%
37.2 [ ] 26 – 50%
37.3 [ ] 51 -75%
37.4 [ ] 76 -100%

38. What do you understand by the terminology extracorporeally and intracorporeally?

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SECTION D: Post-operative phase (to be answered by Recovery Room nurses and ward nurses).

39. Would you expect different complications for laparoscopic surgery as compared to open surgery
39.1 [ ] The same complications
39.2 [ ] Different but less complications
39.3 [ ] Different but more complications

40. Substantiate your answer
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
41. Do you expect the complications for laparoscopic surgery to manifest more severely?
41.1 More severe
41.2 The same severity
41.3 Less severe

42. Substantiate your answer

43. Is adequate pre-operative hydration essential for all patients undergoing laparoscopic surgery?
43.1 All
43.2 some
43.3 none

44. If the answer to question 43 is all or some, why do you think so

45. What vital signs do you need to monitor post operatively on a patient who had laparoscopic surgery?
46. How would you rate the post operative pain experienced by patients undergoing laparoscopic surgery on a scale of 1 to 5 with 5 being most severe.
46.1 [ ] 1
46.2 [ ] 2
46.3 [ ] 3
46.4 [ ] 4
46.5 [ ] 5

47. What would you attribute these ratings to?
47.1 [ ] The incision mainly
47.2 [ ] The procedure mainly
47.3 [ ] both about equally

48. Substantiate your answer.
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
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49. In your opinion how do patients that have operations done laparoscopically recover
49.1 [ ] Faster
49.2 [ ] The same
49.2 [ ] More slowly

50. Give reasons for your answer.
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........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
51. From your experience as a ward nurse do these patients get discharged sooner?
   51.1 [ ] Sooner
   51.2 [ ] same
   51.3 [ ] Later

52. The infection rate is higher in patients undergoing laparoscopic surgery
   52.1 [ ] higher
   52.2 [ ] The same
   52.3 [ ] lower

53. Substantiate your answer
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………

54. Do you educate your patient about after care post laparoscopic surgery on discharge?
   54.1 [ ] Yes
   54.2 [ ] Not necessary
   54.3 [ ] done by somebody else
   54.4 [ ] no time

55. If your answer is yes, what information do you give them?
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
56. Is the patient provided with a contact number in case of an emergency on discharge?
   - Yes
   - No

57. If your answer is yes, whose telephone no is provided?

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......................................................................................................................................................................
QUESTIONNAIRE FOR PATIENTS
LAPAROSCOPIC SURGERY

INSTRUCTIONS:

➢ Answer all questions
➢ Tick in the box provided

Do not write your name on the questionnaire

SECTION A.

1. Indicate your Age
1.1. 18 - 25 years
1.2. 26 - 35 years
1.3. 36 – 45 years
1.4. 46 years and above

2. Location
2.1 Ward: Public Hospital
2.2 Ward: Private hospital
2.3 Theatre: Public Hospital
2.4 Theatre: Private hospital

3. Gender
3.1 male
3.2 female

4. Race
4.1 white
4.2 black
4.1 coloured
4.2 Asian
SECTION B. PREOPERATIVE

5. Do you know what laparoscopic surgery is
5.1 [know exactly]
5.2 [know something]
5.3 [know nothing about it]

6. Substantiate your answer.
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

7. Was laparoscopic surgery explained to you by the doctor
7.1 [Sufficient information given]
7.2 [some information given]
7.3 [no information given]

8. Have you been given the option to change your mind about whether you want
to continue with laparoscopic surgery or not?
8.1 [Yes]
8.2 [No]

9. How did the doctor explain the procedure to you?
9.1 [Verbally]
9.2 [Pamphlets]
9.3 [videos]
9.4 [other: specify].................................................................
9.5 [Did Not Explain]
10. Did the doctor outline the complications/risks involved in laparoscopic surgery including the possibility of a conversion to open surgery?
   10.1 Yes
   10.2 No

11. What risks/complications did the doctor mention to you?
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

12. Did the doctor discuss the advantages of laparoscopic surgery to you in comparison to open surgery?
   12.1 Yes
   12.2 No

13. What advantages did he/she mention?
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

14. Was the nurse witnessing the consent able to reinforce the doctor’s information?
   14.1 Yes
   14.2 No

15. If the answer to the above question is no, in your opinion was it because the nurse
   15.1 Was not consulted
   15.2 Did not have time
   15.3 Did not know
16. In your opinion was the information imparted to you sufficient for you to make an informed decision as to whether you want to have your operation done laparoscopically.

16.1 Yes

16.2 No

17. If your answer to the above question was no what other information would you have liked to receive before making a decision?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

18. Did you agree to have the operation done laparoscopically because

18.1 Own choice

18.2 Doctor knows best

18.3 Afraid of the doctor

18.4 Wanted relief, no matter what?

19. If your answer to no.18 was own choice, was it because you were

19.1 Well informed by the surgeon

19.2 Well informed by the nurse

19.3 Knowledgeable about the procedure

19.4 wanted relief no matter what

19.4 other

20. If your answer to no.19 was other, please explain

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………
21. Do you regard laparoscopic surgery as?
21.1 Safe
21.2 Unsafe
21.3 do not know
22. Give reasons for your answer
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..........................................................................................................................................................
..........................................................................................................................................................
..........................................................................................................................................................

SECTION C: Post-operative phase
23. Would you expect different complications for laparoscopic surgery as compared to open surgery?
23.1 Yes
23.2 No
24. What complications can you expect after laparoscopic surgery
..........................................................................................................................................................
..........................................................................................................................................................
..........................................................................................................................................................
..........................................................................................................................................................

25. Do you expect the complications for laparoscopic surgery to be worse than open surgery?
25.1 worse
25.2 the same
25.3 less

26. If worse why
..........................................................................................................................................................
..........................................................................................................................................................
27. Do you think that you are going to feel more pain afterwards if you have the surgery done laparoscopically?
   27.1 more
   27.2 same
   27.3 less

28. Give a reason for your answer
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

29. Do you think the bleeding after the operation would be?
   29.1 more
   29.2 same
   29.3 less

30. Do you think that there would be more damage to other organs as compared to open surgery?
   30.1 more
   30.2 same
   30.3 less

31. Did the doctor inform you that you may experience muscle pain involving the shoulder and the neck after the procedure?
   31.1 Yes
   31.2 No
32. In your opinion do you think that you are going to recover faster
   32.1 [faster]
   32.1 [the same]
   32.1 [more slowly]

33. Why do you think so?
   ...........................................................................................................
   ...........................................................................................................
   ...........................................................................................................
   ...........................................................................................................

34. How soon do you think you will be able to go back to work or resume your normal daily activities
   ...........................................................................................................
   ...........................................................................................................
   ...........................................................................................................
   ...........................................................................................................

35. What important aftercare information was given to you?
   ...........................................................................................................
   ...........................................................................................................
   ...........................................................................................................
   ...........................................................................................................

36. Do you feel confident of coping after being discharged from the hospital?
   36.1 [Yes]
   36.2 [No]
   36.3 [am not sure]