

**INVESTIGATION OF INCIDENCE AND  
RISK FACTORS OF POST CAESAREAN  
SECTION WOUND SEPSIS IN HLABISA  
HOSPITAL AND THE IMPLICATIONS TO  
PATIENTS**

By

**ABIGAIL NONHLANHLA KHATHI**

**INVESTIGATION OF INCIDENCE AND RISK FACTORS  
OF POST CAESAREAN SECTION WOUND SEPSIS IN  
HLABISA HOSPITAL AND IMPLICATIONS TO  
PATIENTS**

**By**

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**DATE SUBMITTED:        OCTOBER 1997**

## DECLARATION

I, ABIGAIL NONHLANHLA KHATHI declare that “Investigation of incidence and risk factors of post caesarean section wound sepsis in Hlabisa Hospital and the implications to patients” is my own work and all sources I have used or quoted have been acknowledged by means of complete references.

SIGNATURE

  
(A.N. KHATHI)

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**A.N. KHATHI**



## DEDICATION

This work is dedicated to the following:

- (i) My colleagues in the nursing profession who provide midwifery and surgical care to patients and clients.
- (ii) Midwifery and operating theatre nursing science students as a motivation for further research studies.
- (iii) My “boys” Mthokozi and Nhlakanipho.
- (iv) My mother Minah Buyenzeni Mofokeng for instilling in me a love of education.
- (v) My beloved husband Themba for his love, encouragement and support through all my studies.
- (vi) Last but not the least to God the Almighty.

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## ABSTRACT

The descriptive study on patients who developed post caesarean section wound sepsis was undertaken at Hlabisa Hospital at the North of KwaZulu-Natal South Africa. The purpose of the study was to determine the incidence of patients with post caesarean section wound sepsis, identify personnel, patient and environmental risk factors as well as establish the implications of post caesarean section wound sepsis to patients.

The target population consisted of professional nurses working in labour ward and operating theatre. The patients who developed post caesarean section wound sepsis were also included.

Data was collected by means of questionnaires, structured interview and checklist which was designed to collect information from patient's records.

The study revealed that out of eight hundred and fifteen (815) patients who underwent caesarean section between July 1995 to July 1996, 16 (2%) developed post caesarean section wound sepsis. The incidence remain unchanged when comparing the statistics of January 1994 to June 1995 which was also 2%. The researcher is of an opinion that there are some factors that need to be identified and controlled to decrease the incidence to less than 2%. Furthermore the study revealed few personnel, patient and environmental risk factors contributing to patients developing post caesarean section wound sepsis. The study also revealed physical, psychosocial and economical problems experienced by patients who had prolonged stay in hospital caused by post caesarean section wound sepsis.

## UITREKOEL

Die beskrywende studie oor pasiënte wat post-keisersnee wondbesmetting ontwikkel het, is te Hlabisa-Hospitaal in die Noorde van KwaZulu-Natal Suid-Afrika gedoen. Die doel van die studie was om die voorkoms van pasiënte met post-keisersnee wondbesmetting te bepaal, personeel te identifiseer en omgewingsrisiko faktore, sowel as die gevolge van postkeisersnee wondbesmetting op pasiënte vas te stel.

Die teikenbevolking het bestaan uit professionele verpleegsters wat in die kraamsaal en operasietheater werk. Die pasiënte wat na-keisersneewonde ontwikkel het is ook ingesluit.

Data is versamel deur middel van vraelyste, gestruktureerde onderhoude en kontrolelys wat ontwerp is om inligting uit pasienterekords te versamel.

Die studie het vertoon dat agt uit eenhonderd-en-vyftien (815) pasiënte wat keisersnee tussen Julie 1995 tot Julie 1996, 16 (2%) na-keisersnee wondbesmetting (-sepsis) ontwikkel het. Die voorkoms bly onveranderd in vergelyking met die statistiek van Januarie 1994 tot Junie 1995 wat ook 2% was. Die navorser is van mening dat daar sekere faktore is wat geïdentifiseer en gekontroleer moet word om die omvang van die voorkoms tot minder as 2% te verminder. Die studie het verder min personeel-, pasiënt- en omgewingsfaktore vertoon wat tot die ontwikkeling van na-keisersnee wondbesmetting in pasiënte bydra.

Die studie het ook fisiese, psigososiale en ekonomiese probleme geïdentifiseer wat deur pasiënte ervaar word wat 'n verlengde verblyf in die hospitaal gehad het wat deur na-keisersnee wondbesmetting veroorsaak is.



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## CHAPTER 1

### ORIENTATION TO THE STUDY

#### BACKGROUND TO THE STUDY

Health of mothers especially in relation to child birth is an important issue. This is supported by the fact that the Minister of Health of South Africa, Doctor Nkosazana Zuma in her nineteen ninety five (1995) budget speech stated her commitment to maternal and child health. This study focuses on the surgical baby delivery and the tendency for these wounds to become septic. This always undermines the quality of the health of the childbearing woman and yet she is expected to effectively raise her children. Apparently the problem of caesarean section surgical wounds of mothers becoming septic continues inspite of ongoing efforts to prevent, cure and promote healing of septic caesarean section wounds.

The history of sepsis goes right back to the early primitive times when surgical treatment was crude and its use was hampered by inadequate knowledge of effective ways to control pain and infection. Some surgery was done more to allow evil spirits to escape than to cure (Beland, 1970:620). As years went by, knowledge of anatomy and the factors that influence wound healing became important. In modern surgery the concept of asepsis received much attention. It is alleged that Semmelweis, a Hungarian physician put a notice on a hospital door stating: "As of today, May 1847 every doctor or student before entering maternity wards TO WASH HIS HANDS thoroughly in a basin of chlorine water which is being placed at the entrance" (Beland, 1970:750). In the middle of the 1800's Louis Pasteur developed the germ theory. In 1877 Robert Koch postulated that pus in wounds resulted from the introduction of an outside agent and was not an essential part of the healing process. Prior to this, pus formation was regarded as an essential aspect of wound healing. It has now become



known that infection of wounds delays healing (Beland, 1970:784). Despite these developments and up-to-date knowledge wounds continue to be infected.

Although this research study concentrated on a particular hospital in Northern KwaZulu-Natal, there is evidence that caesarean section wound infection is a cause for concern in other places and countries as well. Henderson & Love (1991) as cited by Hillan (1995) state that in a Canadian Community the post caesarean section wound infection accounted for the largest population of the post caesarean section patients. Tay, Tau & Chia, (1993:56) reported a monthly increase in the incidence of caesarean section wound infection in Singapore, that was more prevalent in crowded wards. Hillan, (1995:1040) at Glasgow University observed that the incidence of wound sepsis was higher in emergency surgery than in elective surgery.

Patients who have undergone surgery run a certain risk of developing an infection of wounds. It is probably for this reason that Smoleniec & James (1993:16) regard mothers with post caesarean section wound sepsis as "the at risk" patients. In support of this Lombard (1994) conducted a study on "determinants of post caesarean section wound sepsis" at Livingstone Hospital (Port Elizabeth). The study revealed that 69 (11,4%) patients out of six hundred and three (603) who underwent caesarean section developed post caesarean section wound sepsis. He further established that 7-15% of all caesarean section patients at Livingstone Hospital developed post caesarean section wound infection. According to Barnado (1994:2) infection control nurses need to study outbreaks of infection and implement measures to control them.

In spite of developments and advances in medical intervention, it is unfortunate that there is a notable post caesarean section wound infection that may have adverse effects on patients. The price to be paid when a wound goes septic is quite high. Post operative infection cause a delay in the normal healing process of wounds (Cruise, 1993:60). Some of the patients become miserable which is displayed by depression after being informed that the wound has become infected and that this may lead to poor wound healing. Further, wound sepsis may give rise to other issues like debridement of a septic wound, secondary suturing and an ugly scar (Appleton &



Leaper, 1992:20). All this is possibly accompanied by a whole range of inconveniences and problems which mothers and their families had not foreseen. Lombard, (1994:186) states that in addition to all these, patients usually incur considerable costs if they go through these complications.

## MOTIVATION TO THE STUDY

The researcher being a theatre nurse, an infection control and wound care committee member is concerned about the incidence and prevention of wound sepsis in Hlabisa Hospital. The researcher has observed that between January 1994 to June 1995 one thousand and forty six (1046) patients at Hlabisa Hospital underwent caesarean section and 22 (2%) developed wound infection which according to Baker (1990:42) is an acceptable incidence. There were one hundred and seventy nine (179) patients on whom laparotomy operations other than caesarean section were performed and none of them developed wound sepsis. The researcher was concerned about wound sepsis occurring only in caesarean section patients. It was assumed that probably there are factors that expose caesarean section patients to wound infection.

Another concern was that the researcher assumed that the rate of wound infection though still acceptable may increase if preventive measures are not taken. The researcher was also concerned about the impact experienced by patients who developed post caesarean section wound sepsis. For example some of them became miserable which was displayed by depression after being informed that the wound has become infected, which lead to poor wound healing.

## STATEMENT OF THE PROBLEM

The problem to be investigated was (1) "What is the number of patients who developed post-caesarean section wound sepsis in Hlabisa Hospital between July 1995 to July 1996"? (2) "What is the relationship between risk factors of caesarean section and wound infection"? (3) "What are the implications of wound sepsis for patients"?

## OBJECTIVES OF THE STUDY

The objectives of the study were:-

- establish the incidence of post caesarean section wound sepsis at Hlabisa Hospital.
- identify nursing staff, patient and environmental related factors that contribute to wound infection.
- establish the implications of post caesarean section wound sepsis for patients.

## SIGNIFICANCE OF THE STUDY

The study attempted to expose environmental, patient and nursing staff related factors that cause post caesarean section wound infection in the institution under study. The study also highlighted the preventive measures against post caesarean section wound sepsis that need to be adopted. The findings and recommendations of the study would assist the management of the institution under study in reviewing the existing infection control policy. The importance of the proposed study could be viewed against the background of related factors. It would contribute to the few studies that were performed by nurses on post caesarean section wound sepsis.

Uys (1990:23) of H.F. Verwoerd Hospital (Pretoria) and Kelso (1990:40) of Northern Ireland Social Services conducted a study on risk factors of wound infection. Therefore this study will form basis on which further research may be developed.

## SCOPE AND DELIMITATION OF THE STUDY

The study was directed at those patients who developed post caesarean section wound sepsis in Hlabisa Hospital and professional nurses working in the labour ward and operating theatre.

## DEFINITION OF CONCEPTS

In order that the readers have the same understanding as the researcher with regard to key concepts used in this study, the operational definitions have been formulated.

### Sepsis

Sepsis means “an infection of tissues associated especially with pyogenic microbes and their toxins” (Vlok, 1995:293). In this study sepsis means invasion of a caesarean section patient by pus formation bacteria.

### Infection

Infection means “The pathological effects of the invasion of the body by microbes”, (Vlok, 1983:307). For the purpose of this study infection means any caesarean section wound that has been invaded by micro-organisms in which the woman infected presents with purulent discharge after performance of an operation.

### Wound sepsis

Wound sepsis is “that surgical wound infection which occurs between the skin and the soft tissues of the patient’s body” (Meakins, 1994:51). In this study wound sepsis means post caesarean section wound infection which occurs between the skin and abdominal tissues of the women.

### Caesarean section

Caesarean section comes from the Latin word “Caedo” which means to cut (Jensen, Benson & Bobak, 1977:401). In this study caesarean section is therefore a delivery of the foetus through the abdominal and uterine incisions.



### Patient

Longman (1980) dictionary of contemporary english defines a patient as “a person receiving medical treatment from a doctor and or in a hospital” (Longman, 1980:98). For the purpose of this study a patient means a woman who is admitted in the hospital and has undergone caesarean section operation.

### Nosocomial infection

Nosocomial infection or hospital associated infection is “that infection which appears to have developed during hospitalisation or is not known to have been incubating at the time of patient admission” (Dubbay & Crubb, 1978:16). For the purpose of this study nosocomial infection refers to any post caesarean section wound sepsis which has developed during hospitalisation.

### Incidence

Incidence is “the number of cases in a specified number of persons over a period such as 3 cases in 10,000 people in one year” (Hull & Isaacs, 1986:204). In this study the incidence means the number of patients who developed post caesarean section wound sepsis between July 1995 to July 1996 out of those who underwent caesarean section operations.

### Risk factor

Risk factor is “an aspect of personal behaviour or life style or environmental exposure or characteristics which on the basis of epidemiologic evidence is known to be associated with health related conditions” (Last 1995:67). For the purpose of the

study a risk factor is a predisposing cause to post caesarean section wound sepsis which may be personnel, environmental or patient related.

## ORGANISATION OF THE STUDY

**Chapter one** presents the background of the problem, statement of the problem, objectives of the study, significance of the study, definition of special concepts used in the study and organisation of the study.

**Chapter two** presents a review of literature that is books, journals and studies pertaining to post caesarean section wound sepsis, incidence and risk factors of wound infection and conceptual framework of this study.

**Chapter three** discusses the research methodology that was used.

**Chapter four** discusses the findings and analysis of the collected data.

**Chapter five** consists of summary, limitations, implications of findings, conclusion and recommendations.

## **CHAPTER 2**

### **REVIEW OF RELATED LITERATURE**

#### **INTRODUCTION**

This chapter presents a review of relevant literature pertaining to various ideas on the incidence and risk factors of post caesarean section wound sepsis and its implications to patients.

#### **THE INCIDENCE OF POST CAESAREAN SECTION - WOUND SEPSIS**

Post operative wound infection is of great concern to the surgeon, the patient and nurse. This is so because the patient may have acquired the infection during the hospital stay. This is supported by Gregory (1990:44) who states that patients are exposed to wound infection from the day of admission in hospital, and this suggests that health care workers must make use of preventive measures for nosocomial infection. Hillan (1995:1035) maintains that caesarean section is a major operative procedure which has many complications such as puerperal sepsis and post operative wound infection. Hillan (1995:1036) further states that women who undergo an emergency caesarean section operation are at a high risk of developing wound sepsis than those who undergo elective caesarean section.

Various studies have been undertaken internationally and nationally on post caesarean section wound sepsis. A study on "post operative wound infection in obstetrics and gynaecology", conducted by Chia, Tau & Tay in 1993 at Singapore, revealed that out of six thousand six hundred and thirty nine (6,639) major operations performed over a 12 month period, the overall wound infection rate was 2,26%. It also revealed that the highest wound infection occurred in hysterectomies. Wound infection was also found to be higher in surgical wards because of overcrowding of surgical patients which



lowers the standard of infection control. The common causative micro-organism isolated was staphylococcus aureus. In Canada, Henderson & Love (1991) as cited by Hillan (1995:1036) conducted a study over a three year period on "incidence of hospital acquired infections associated with caesarean section". The study revealed that out of 793 women delivered by secondary caesarean section, the overall rate of infection was 46,1%. In England and Wales Moir-Bussy, Hutton & Thompson conducted a study in 1984 on a "prospective incidence of wound infection after caesarean section". The study revealed that out of 2,370 patients who participated in the study, 141 (6%) patients acquired post caesarean section wound infection. This implies that post caesarean section wound infection rate was high and unacceptable.

At National level, Lombard (1994:186) conducted a research study on "determinants of post caesarean section wound sepsis" at Livingstone Hospital (Port Elizabeth). The results revealed that 69 (11,4%) patients out of 603 patients who had caesarean section performed, developed wound sepsis. Lombard (1994:186) further points out that wound sepsis complicates between 0,7% and 15% of all caesarean section patients, incurring considerable maternal morbidity, inconvenience and cost. This indicates how post caesarean section patients are affected postoperatively. Not enough literature could be found in South Africa on incidence of post caesarean section wound infection could not be recovered.

Baker (1990:43) is of the opinion that the incidence on clean wound infection rate of 1% is regarded as normal and above 2% as being unacceptable. Literature on the incidence of post caesarean section wound infection indicates that the rate of post caesarean section wound infection is high, for example Henderson & Love (1991) as cited by Hillan (1995:1036) indicate that the incidence ranges between 42,1% and 46,1% in Canada. Therefore it means that the literature on risk factors needs to be reviewed in order to identify those risk factors which predispose to post caesarean section wound sepsis.

## RISK FACTORS FOR POST CAESAREAN SECTION WOUND SEPSIS

Various authors have identified many factors that are responsible for post caesarean section wound sepsis. The factors identified include:-

### Number of vaginal examinations

A number of vaginal examinations performed, increase the risk of wound infection through bacterial contamination of amniotic fluid to women who will end up by having caesarean section performed (Emmons, Kohn, Jackson & Eschenbach 1988). This is supported by Hawrylyshyn, Bernstein & Papsin, 1980; Green & Sarubbi, 1977; Magann, Dodson, Ray, Harris, Martin & Morrison, 1984; Moir-Bussy, Hutton & Thompson, 1984; and Roberts, Maccato, Faro & Pennel 1993 who maintain that the number of vaginal examinations performed before the caesarean section is one of the risk factors that predispose to a high rate of wound infection postoperatively.

### Duration of rupture of membranes

Farrel, Anderson & Work (1980:698) state that many authors have searched for causes of post caesarean section wound sepsis and have identified ruptured membranes as a predisposing factor, however the period between rupture of membranes and performance of a caesarean section that may expose the woman to wound infection is not stated. Martin & Reeder (1991:291) emphasise that the period of rupture of membranes must be recorded so that attention and care is undertaken to minimise the risk of uterine infection which might lead to endometritis that predispose to postcaesarean section wound sepsis. Bobak, Lowdermilk, Jensen & Perry (1991:62)



maintain that if artificial rupture of membranes has been undertaken, labour needs to be initiated within 12 hours as prolonged rupture of membranes may lead to intrauterine infection that predispose to post caesarean section wound sepsis.

The fact that the length of time between rupture of membranes and performance of the caesarean section predisposes to post caesarean section wound sepsis is supported by a study of "post caesarean section morbidity" conducted by Nielsen & Hokegard in 1982. The study revealed that out of 275 patients who had caesarean section performed, an infection rate of 18,2% for the first 16 hours after rupture of membranes occurred. It was also evident from the study that after 16 hours the rate increased to 53,2% of 126 patients.

### Obesity

Literature reveals that obesity is one of the risk factors that predispose to various complications after caesarean section (Green & Sarubbi 1977; Nielsen & Hokegard 1982; Emmons *et al* 1988; Magann *et al*, 1984; Moir-Bussy *et al*, 1984 and Naumann, Hauth, Owen, Hodgkins & Lincoln, 1995) Naumann *et al* (1995) maintain that in obesity the tissue is susceptible to infection after contamination with pathogenic organisms. This is attributed to the relatively poor blood supply in the subcutaneous fat. Skin disruption of at least one centimetre also appears to lead to wound infection.

### Anaemia

According to Hawrylyshyn *et al* (1991:296) patients who have had anaemia during post partum have a lowered resistance therefore are likely to develop wound infection. That is why haemoglobin estimation is performed during the antenatal period.

## INDICATIONS FOR CAESAREAN SECTION AS A RISK FACTOR FOR POST CAESAREAN SECTION WOUND SEPSIS

It is evident from literature that certain indications for caesarean section are risk factors to post caesarean section wound sepsis. Some of the indications that are revealed by the literature are:-

### Cephalopelvic disproportion

Cephalopelvic disproportion occurs when a foetal head fails to pass through the woman's pelvic canal (Bobak et al, 1991:904). Cephalopelvic disproportion causes prolonged labour which exposes the vagina to micro-organisms. Nielsen & Hokegard (1982:915), highlight that when a presenting part of the foetus remains either at or below the ischial spines the woman is at a greater risk of developing post caesarean section wound sepsis if a caesarean section is performed. In cephalopelvic disproportion a woman is also having prolonged labour and frequent vaginal examinations are likely to be performed and sometimes may have been put on trial of labour, or may have been in labour for sometime at home and this exposes her to entry of micro-organisms through the vaginal canal.

### Dystocia

When a woman's labour is difficult and abnormal the diagnosis of dystocia is made (Bobak et al, 1991:904). According to Sellers (1993:1381), dystocia is due to either the foetal causes such as abnormal presentation of the foetus which could be cephalopelvic disproportion or maternal causes such as poor uterine contractions and poor bearing down effort. A woman with dystocia often ends up in a caesarean section. It is the prolonged difficult labour that exposes the woman to entry of micro-

organisms through the vaginal canal that leads to post caesarean section wound sepsis. This is supported by Sellers (1993:1389) who states that one of the effects of dystocia is puerperal sepsis.

### Malpresentation

When the presenting part of the foetus is not the foetal head malpresentation is diagnosed. Malpresentation occurs when the foetus presents with the hand, feet, breech and or the umbilical cord. During malpresentation, especially when membranes have ruptured, if a woman is performed a caesarean section, exposure of the vaginal canal to entry of micro-organisms occurs and this may lead to post caesarean section wound infection.

### Emergency caesarean section

It is further reported that women who are likely to develop wound sepsis are those who have had an emergency caesarean section (Hillan, 1995:1035; Green & Sarubbi, 1977:688 and Nielsen & Hokegard, 1982:911). This is probably attributed to the fact that emergency caesarean section is performed on patients who had prolonged labour, trial of labour and who are exposed to frequent vaginal examinations. This exposes a woman to entry of micro-organisms through the vaginal canal.

## **OTHER RISK FACTORS FOR POST CAESAREAN SECTION WOUND SEPSIS**

### Low socio economic status

Low socio economic status leads to poverty which causes malnutrition and lowered resistance to the pregnant mother. A patient who comes from a background with low socio-economic status is likely to develop wound infection after caesarean section (Magann et al, 1984:922).



### Experience of a surgeon

Moir-Bussy **et al** (1994:369), and Magann **et al** (1993:924) are of the idea that wound infection is associated with the experience of the surgeon but do not state clearly what type of experience and how that type of experience contributes to wound infection.

### Length of the operation

According to Magann **et al** (1993:924), the length of a caesarean section is a risk factor as it exposes the patient to wound infection which is acquired during the performance of a surgical procedure. However Naumann **et al** (1995:414) is of the idea that the length of the operation is not associated with wound infection.

### Diabetes

Insulin dependent diabetic patients who have undergone surgical procedures, are exposed to elevated blood sugar and dehydration, which lead to low resistance and delayed wound healing. Insulin dependent diabetic patients with elevated blood sugar and or dehydration, may develop wound infection after caesarean section (Luckman & Sorenson, 1980:1575).

### Septic lesions in caesarean section patients

Patients who have had septic lesions such as tonsillitis or upper respiratory tract infection are prone to develop post caesarean section wound infection. This is due to the presence of pathogenic micro-organisms in the patients body (Nightingale, 1987:63 and Emmons **et al**, 1988:559).

### Poor wound healing

Patients with caesarean section wounds are exposed to poor wound healing due to the factors such as lowered resistance to infection, poor nutritional status of the patient and type of abdominal incision. Patients with diabetes, anaemia, obesity and those on steroid drugs have lowered resistance to infection and therefore have impaired wound healing process (Brunner & Suddarth, 1980:190).

According to Rhodes (1978:149) if post caesarean section patients are exposed to poor nutrition, healing of wound is delayed. Rhodes (1978:149) further emphasised that caesarean section patients need adequate nutrition rich in protein which assist in growth of new tissue, and vitamin C which assist in healing of the wound, formation of antibodies and formation of a strong wound scar.

Lombard (1994:188) regards a transverse abdominal incision as being protective against poor wound healing as compared to a vertical incision. Vertical incision has a tendency to hyperaemia caused by poor blood supply to the tissues leading to poor wound healing (Atkinson & Kohn, 1978:78).

### **IMPLICATIONS OF POST CAESAREAN SECTION WOUND SEPSIS TO PATIENTS**

Wound sepsis causes delay in the recovery of a patient due to delayed wound healing and this prolongs the patients' stay in hospital. The prolonged hospital stay is expensive to the patient who has to pay high fees in hospital. In Canada wound infection lengthened patient stay by an average of 10 days resulting in an extra 2,000 dollars per patient (Mishriki, Law & Jeffrey, 1990:229). This is true because even in private hospitals in South Africa, the hospital cost is very high and it is even worse when the hospital stay is prolonged.

The health service has to utilise human and material resources for effective care of the patient with wound infection. Additional health professionals are required for the additional number of patients who are not discharged and are increasing the bed occupancy. Some expensive material resources such as cleansing solutions, wound drains and antibiotic creams are utilised to facilitate wound healing. Systemic antibiotics are even prescribed for those patients (Pearce, 1996:3).

Certain post caesarean section wounds may require special techniques to be undertaken such as exploration, debridement and secondary suturing of wound. Some procedures are performed under general anaesthesia which means that patients are exposed to repeated general anaesthesia. Even patients themselves react in different ways to general anaesthesia. Psychologically patients do not want to be exposed to general anaesthesia. Some of them even refuse to be sent to the operating theatre for further surgery (Magann *et al*, 1993; Hillan, 1995; Emmons *et al*, 1988 and Roberts *et al*, 1993).

A patient may also be exposed to readmission to the hospital after having been discharged. In Birmingham 10 out of 27 women with wound complications required readmission in the hospital (Naumann *et al*, 1995:412). The patient with wound infection is exposed to poor quality of life which is due to pain that the patient experiences while having wound infection (Pearce, 1996:1). The patient, as the member of the family is psychologically affected by the long stay in hospital. Prolonged hospital stay isolates the patient from the family, which lead to emotional problems for both the patient and the family. It is further noted that wound sepsis may even cause death due to septicaemia (Mishriki *et al*, 1990:229).

Therefore it is clear that wound infection needs to be prevented because of the consequences to the patient, her family and the hospital. Eliminating risk factors of wound infection is a challenge to the health professionals particularly nurses. It is therefore necessary to discuss prevention of post caesarean section wound sepsis.



## PREVENTION OF POST CAESAREAN SECTION WOUND SEPSIS

Generally, literature on prevention of wound infection highlights that health professionals should be aware of hospital acquired infection because despite the fact that the hospital appears to be clean there are some areas that are not. It is further emphasised that people are from different environments and carry different microbes (Ellis & Nowliss, 1981:168).

Prevention of wound infection should commence during antenatal care, (during pregnancy) in labour ward, (during delivery) in the operating theatre, (during surgery, and in lying in ward (during the post-operative care) (Larsen, 1995:25).

## PREVENTION OF WOUND INFECTION DURING ANTENATAL CARE

Antenatal period is the most important period during which the woman is prepared mentally and physically for labour. Planning and provision of all facilities that will assist to minimise risk factors that could contribute to wound sepsis after performance of a caesarean section are undertaken (Hibbard, 1988:82). All risk factors that could cause post caesarean section wound infection are prevented, identified, treated or controlled (Hawrylyshyn *et al*, 1981:296).

Assessment of pregnant mothers is done by interviewing the patient, to obtain the subjective information on risk factors such as diabetes, previous caesarean section, pulmonary tuberculosis and others. Health education on adequate nutrition, personal cleanliness, regular antenatal clinic attendances, warning signs of labour and physical exercises to ensure optimal health of all mothers is undertaken.

Health education of women who are likely to have a caesarean section performed such as those with diabetes, hypertension and previous assisted delivery such as symphysiotomy, vacuum extraction or forceps delivery is undertaken (Larsen, 1995:26). Blood tests for Wassermann reaction to exclude syphilis, rhesus for blood group and haemoglobin estimation to exclude anaemia are taken. X-Ray pelvimetry is

done at thirty six weeks ( $^{36}/_{52}$ ) of pregnancy in suspected women to exclude contracted or android pelvis that causes cephalo-pelvic disproportion which is a risk factor for post caesarean section wound sepsis (Bobak et al, 1991:714). According to Hibbard (1988:80) medical surveillance must be undertaken to ensure that treatment is given to control any condition which might be a risk factor for a woman. Therefore during antenatal care all patient related factors are identified and treated.

## PREVENTION OF WOUND INFECTION IN THE LABOUR WARD

The labour ward is a unit where pregnant women are admitted for delivery. Labour ward is likely to predispose the women to infection associated with environmental, personnel and patient related risk factors if preventive measures are not strictly adhered to (Gregory, 1990:41).

Patients admitted to the labour are assessed of any condition that might lead to infection. Clean attire is worn by the patient after a full bath, before and after delivery (Sellers, 1993:356).

Handwashing is put into practice and not just theory because health professionals' transfer infection from one patient to another, from themselves and from physical objects around patients and to themselves (Ellis & Nowliss, 1981:168).

During labour, skilled assessment of patients in the labour ward is undertaken to identify patients with cephalopelvic disproportion and abnormal labour. Patients with ruptured membranes are monitored for duration of rupture of membranes. If the patient has spontaneous early rupture of membranes and labour does not start within 12-18 hours a high vaginal swab is taken for culture and sensitivity, and antibiotics are prescribed as a prophylactic measure against intrauterine infection (Sellers, 1993:1266).



Early diagnosis and referral of patients with difficult labour for which caesarean section may be indicated is performed to avoid entry of micro-organisms into the vaginal canal which could cause wound infection (Nielsen & Hokegard 1982:913).

## PREVENTION OF WOUND INFECTION IN OPERATING THEATRE

Wound infection is one of the health hazards which is a life threatening complication to surgical patients. It may also occur as a result of a simple omissionbreak in operating theatre practice by a single surgical team member, such as failure to clean floors and furniture, as standardised, and use of inadequately sterilised instruments and supplies (Atkinson & Fortunato, 1997). The surgical team adheres to principles of aseptic and sterile technique, and monitor the application of the principles in the operating room.

Patients who had a caesarean operation are exposed to a high risk of wound infection as viewed by Henderson & Love (1991) as cited by Hillan (1995). Detection, prevention and control of personnel, patient and environmental related factors of post caesarean section wound infection are undertaken in operating theatre.

### Environmental control

Surgical procedures are performed in an operating room where adequate time is allowed between patients for terminal disinfection of the environment. Operating theatre is a high risk area which calls for removal of a higher percentage of micro-organisms from the environment (Atkinson & Kohn, 1978:28). Additionally the operating theatre is designed in such a way that infection control measures are implemented as there are dirty, clean and sterile zones which clearly divide the operating theatre environment (Nightingale, 1987:18).

Cleaning is the physical removal of soiled or contamination from the floor and furniture surfaces and render them safe for use. Atkinson & Kohn (1978:29) indicate that destroying of micro-organisms from the floor and furniture involves using a disinfectant which effectively removes micro-organisms that transmit infection from

patient to patient or to personnel or environment. Ziady, Small & Louis (1997:36) state that dusting is only effective if it is performed by using a damp cloth in a disinfectant which is specifically used for dusting. This is true because dry dusting only displaces dust but does not remove it. Dust contains large numbers of micro-organisms that cause wound sepsis in surgical patients.

### Operating theatre protective clothing

A theatre personnel's body is a patient contaminator and source of infection therefore protective clothing is used. Adams (1990:34) indicate that one of the aims of using theatre attire is to render the body not to contaminate the sterile and clean operating theatre environment. Nightingale (1987:14) maintain that all theatre personnel change into theatre attire by removing all outside the operating theatre clothing. The principle of which attire is worn first on entering operating theatre is applicable in prevention of wound sepsis. According to Nightingale (1987:14) a theatre cap is worn first when wearing theatre attire to cover hair completely, and prevent bacterial contamination of clean theatre clothing. The theatre cap is followed by a theatre dress, shirt, trouser and canvas or rubber boots. The surgical face mask is the last item to be worn and covers the nose and mouth completely and is further worn whenever a surgical procedure is performed.

### Aseptic technique

The surgical team maintains a good aseptic technique through utilising all measures and sterile materials to avoid contamination of surgical wounds by micro-organisms (Nightingale, 1987:25). Aseptic technique involves preparation of the patient's skin prior to the surgical procedure, so that the skin is free from micro-organisms and skin oil by using an antiseptic solution such as povidine iodine and hibitane 0,5% in 70% alcohol (Atkinson & Kohn, (1978:50). These measures are also taken during setting of sterile trays for surgical procedures by all surgical teams to prevent wound infection (Atkinson & Fortunato, 1997:68).



### Surgical handwashing

Surgical handwashing is the thorough cleansing of all surfaces of hands and arms using a well lathered antibacterial soap, such as hibiscrub and adequate rinsing under a flow of tap water (Atkinson & Fortunato, 1997:32). Surgical handwashing is performed to remove micro-organisms that are liable to cause wound infection. Adams (1990:35) indicates that handwashing is also performed before theatre personnel wear clean operating theatre attire to prevent contamination.

Operating theatre personnel observes general preparation principles for handwashing, such as keeping of short nails to prevent glove puncture, avoidance of nail polish which harbour micro-organisms and removal of jewellery from fingers, wrists and neck. Atkinson & Fortunato, (1997:33) maintain that surgical handwashing is performed according to the standardised hospital policy to prevent contamination which causes post operative wound sepsis.

### Hlabisa Hospital Infection Control Policy of 1992

To aid in prevention of wound sepsis the policy states that prevention, management and control of post caesarean section wound infection is as follows:-

#### Environmental Control

In the labour ward the floor is cleaned regularly with biocide D disinfectant solution. Damp dusting of furniture is done using biocide D spray solution and dusting cloths. Soiled sanitary pads and soiled wound dressings are disposed of as medical waste. In the operating theatre the floor is cleaned in between surgical procedures with biocide

D disinfectant solution, using the 2 bucket system that is rinsing water in the second bucket. Damp dusting of furniture is done as mentioned in labour ward.

### Adherence to aseptic technique

In the labour ward aseptic technique principles are adhered to during labour ward procedures such as vulval swabbing, urinary catheterization, vaginal examination and when conducting a delivery. Labour ward health professionals wear masks and sterile gowns when conducting a delivery.

In the operating theatre aseptic technique is observed when preparing for surgical procedures. The sterility and expiry dates of packs is checked before opening a sterile pack. Daily effectiveness of autoclaves is performed for the good working order. All members of the surgical team develop a surgical aseptic conscience towards contamination during skin preparation of patients. Caesarean section patients' skin is prepared with hibitane 0,5% in 70% alcohol and povidone iodine solution by cleaning from the xiphisternum to midthighs.

### Handwashing

All labour ward health professionals wash hands using hibiscrub soap before and after all labour ward procedures and after attending to each patient. Hibiscrub soap, hand paper towels and hibitane 0,5% in 70% alcohol are available at all times.

In operating theatre surgical handwashing is done with hibiscrub soap after removal of jewellery such as the wedding ring. Nails are kept short, clean and without nail polish. The sterile nail brush is used for cleaning nails only. All steps of surgical handwashing



start from hands down the forearms not vice versa. Surgical handwashing is performed for five to seven minutes to ensure effective handwashing.

All women presenting with midtrimester abortion; premature labour, unexplained stillbirth and premature rupture of membranes are given a course of antibiotics such as erythromycin 500 milligrams four times a day or ampicillin 500 milligrams and metronidazole 400 milligrams three times a day for seven days.

All health professionals perform four hourly vaginal examination on patients who are in early labour. Two hourly vaginal examination is performed for those who are in established labour thereafter vaginal examination is performed when necessary.

Prelabour rupture of membranes is diagnosed by using a sterile vaginal speculum. If a patient is not in labour a vaginal examination is not performed. A cervical swab is taken for culture and sensitivity if a patient presents with premature rupture of membranes, to exclude infection.

In labour ward intra-uterine infection is diagnosed if a woman presents with pyrexia, abdominal pain and or rupture of membranes. Amniocentesis is taken for gram stain if a patient presents with the above symptoms to confirm diagnosis of intrauterine infection.

In operating theatre health professionals with upper respiratory tract infection are not to participate in the surgical procedures. They report to the supervisor for allocation to the packroom. Health professionals wear operating theatre attire correctly, such as wearing a theatre cap first, to cover the whole head completely, for prevention of bacterial contamination to clean attire if worn last. Operating theatre attire is never worn for outside theatre use. A surgical face mask covers the nose and mouth

completely and is always worn in the sterile zone of the operating theatre. Draping principles are observed at all times to prevent contamination while exposing the operation site.

#### WOUND SEPSIS PREVENTIVE MEASURES OF A CAESAREAN SECTION PATIENT IN POST CAESAREAN SECTION UNIT

On the first day the patient's urinary catheter is removed within 48 hours, if the urine is not bloodstained or scanty to prevent urinary tract infection, which could lead to post caesarean section wound infection.

Blood specimen is taken from the patient for estimation of haemoglobin to exclude anaemia. If haemoglobin is less than 10g% oral ferrous sulphate, two hundred (200) milligrams three times a day is given. The attention of a medical officer is drawn if the patient presents with a temperature of 37,8 degrees celsius or more after 48 hours. If fever persists for two consecutive days the medical officer must assess the condition of the patient and the cause of fever. The medical officer will then prescribe antibiotics for seven days.

On the third day the wound dressing is removed through observing principles of aseptic technique. Mercurochrome paint is applied daily after cleaning the wound with hibitane 0,5% in 70% alcohol. If there is any oozing of blood from the wound of the patient repacking is done until the patient is reviewed by the surgeon. If there is a purulent discharge from the wound confirmation of wound infection is made. The wound cleansing solution must be changed from alcohol based to sterile sodium chloride 0,9%. Infected wounds are cleaned daily with sterile sodium chloride, 0,9% and povidoneiodine cream. If wound sepsis does not improve the surgeon prescribes antibiotics and performs surgical cleaning of wound in the operating theatre.

Post caesarean section patients are encouraged early ambulation which will aid in the healing process. Patients personal hygiene is attended to until the condition is stable. Health education on handwashing is given to patients and all categories of health professionals, to prevent spread of wound infection.

For patients with transverse incision, sutures are removed on the fifth day and discharged. For patients with vertical incision, sutures are removed on the seventh day and discharged. Obese patients sutures are removed on the tenth day thereafter discharged.

The purpose or aim of formulating this internal policy was to control wound sepsis in the ward. The researcher assumes that there is inadequate adherence to this policy. This probably may be due to the fact that there is no medical surgical clinical nurse specialist who is better equipped with knowledge in the control of environment and sepsis in the institution.

#### THE IMPORTANCE OF A CLINICAL NURSE SPECIALIST IN THE MEDICAL SURGICAL UNIT

Many of the best nurse practitioners in South Africa are lured into management and education where direct patient contact may be minimal or non existent. This suggests that the profession feels that patients must be cared for by nurses not considered to be the best (Researchers own experience). Brown & Jaros (1990:19), state "Today clinical nursing in South Africa is at crossroads, they further state that "if the nursing profession is to be of good service to the society it must provide a satisfactory and challenging career structure in the clinical setting". A nurse manager and or nurse educator who lacks clinical nursing experience may be inadequate in supervising patient care and or teaching patient care.



Brown & Jaros (1990:20), further point out that there are more nurses than any other group of health care professionals in South Africa and it is therefore important to emphasise and clarify the importance of the clinical nurse specialist.

A clinical nurse specialist's role is a flexible and mobile one. She/he is a nurse clinician with advanced knowledge, skill and competence in a specialist area of nursing. This nurse clinician is not an answer to nursing care problems but an approach to quality patient care. The clinical nurses' role is classified according to clinical, research, educational and administrative component (Hellman, 1994:84). The clinical component comprises of a practitioner, a consultant, a role model and a change agent.

The clinical nurse specialist has independent and interdependent functions in a clinical setting. These functions are at an advanced level therefore they enable this nurse to be distinguished from an ordinary nurse. The medical surgical clinical nurse specialist's independent functions focus on promotion of safety and security of the patient by promoting asepsis and cleanliness throughout the patients' hospitalisation (Mellish, 1992:62).

The interdependent functions refer to the interrelationship the clinical nurse specialist has between her/him and other members of the health team for the benefit of the patient.

The clinical nurse specialist has a teaching role whereby she or he utilises the teaching skill to guide patients in medical surgical units on health management aspects as early as during the antenatal care phase (Menard, 1987:74).



A medical surgical nurse specialist is responsible for initiating, facilitating and co-ordinating research projects relating to research problems such as post operative wound sepsis. He/she implements changes according to the findings (Kraenzle, 1992:52).

In a surgical unit, a clinical nurse specialist performs function to all surgical patients, pre and postoperatively when experiencing problems of wound sepsis. As a consultant he/she guides the patients and counsels them on wound management problems. She/he is always available for patients and health care workers (Menard, 1987:90). A clinical nurse specialist is responsible for initiating formulation of protocols, procedure and policy manuals that will reduce or eliminate wound sepsis in a surgical unit.

#### THE MEDICAL SURGICAL CLINICAL NURSE SPECIALIST AS A CHANGE AGENT

Nursing profession has undergone a lot of changes during recent years. There is yet other changes that are currently facing South African nurses during the period of transformation. These changes include regionalisation and implementation of district health system services with health care workers adapting to changes. Therefore each region needs a clinical nurse specialist to offer in-service education on expert knowledge. Nursing intervention has moved from functional to individual nursing care according to the patients' level of dependency (Buthelezi, 1989:2).

The clinical nurse specialist as a medical surgical nurse specialist possesses certain expertise. As an educator he/she educates patients and health professionals in the care of caesarean section patients in prevention of wound infection. The clinical nurse specialist as a change agent identifies any health related problem that may require changes such as the post caesarean section wound sepsis problem in obstetric unit.

People may not accept changes so the clinical nurse specialist may experience problems

during initiating and implementing changes such as changing the old policy. He/she is a person who possesses skills in motivating for change. She may come across personnel who are resistant to changes and those who are for changes (Buthelezi, 1989:13). In her administrative role the clinical nurse specialist supervises health professionals in adhering to principles of prevention of post caesarean section wound sepsis in labour ward, operating theatre and in post caesarean section unit. She also assists in formulation and implementation of policy manuals in medical and surgical units (Menard, 1987:60).

## CONCLUSION

The literature reveals that the post caesarean section wound sepsis is generally high as supported by Lombard, 1979; Hillan, 1995; Moir-Bussy *et al*, 1984 and Nielsen & Hokegard, 1982.

The risk factors of post caesarean section wound sepsis which contributed to the high incidence as revealed by the literature are mainly anaemia, obesity, number of vaginal examinations and ruptured membranes prior to surgery as supported by Farrel *et al*, 1980; Amirikia *et al*, 1980; Nielsen & Hokegard, 1982; Moir-Bussy *et al*, 1984; Lombard, 1994 and Hillan, 1995.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **INTRODUCTION**

In this chapter the researcher describes the research method, the population, the sample, the instrument, its preparation and administration and the plan for analysis of data.

#### **RESEARCH METHOD**

Research method refers to the steps, procedures and strategies used for gathering and analysing data (Polit & Hunglar, 1987:157). A descriptive survey was used. According to Polit & Hunglar, (1987) "descriptive surveys are studies that outline information on characteristics of persons, situations or groups and explore, analyse and solve a problem during which a phenomenon occurs" (Polit & Hunglar, 1987:157).

By using a descriptive survey the researcher aimed at describing the incidence, the risk factors that contribute to post caesarean section wound sepsis and the implications to patients.

#### **DELIMITATION OF THE AREA OF STUDY**

The study was undertaken at Hlabisa Hospital which is situated at region H at the North of KwaZulu Natal. Hlabisa Hospital was chosen as the area of study because of research expenses incurred when conducting research such as finance and time. The institution under study is in close proximity of the researcher and it was possible to reach the target population (professional nurses and patients who developed post caesarean section wound sepsis). The institution under study consists of two hundred



and ninety six (296) approved bed state but the actual bed state ranges between two hundred and ninety six (296) and five hundred and fifty (550).

## **TARGET POPULATION**

The target population consisted of professional nurses working in the operating theatre, labour ward and post caesarean section unit. The professional nurses were chosen as the target population because of their ability to provide relevant information on post caesarean section risk factors, that are personnel, patient as well as environmental related. The patients who developed post caesarean section wound sepsis were also included in the target population as their participation would reveal risk factors and implications of post caesarean section wound sepsis.

## **THE SAMPLE SIZE**

The sample consisted of forty eight (48) respondents: thirty two (32) professional nurses, that is fifteen (15) professional nurses working in operating theatre, seventeen (17) professional nurses working in labour ward and (16) patients who developed post caesarean section wound sepsis.

## **SAMPLING METHOD**

The incidental sampling technique was conducted on patients who developed post caesarean section wound sepsis. As it was impossible to get a group of patients with post caesarean section wound sepsis, the researcher decided to take every patient who developed wound sepsis during her stay in hospital as well as patients who were admitted with post caesarean section wound sepsis. Eventually the sample consisted of sixteen (16) patients who developed post caesarean section wound sepsis in labour ward and operating theatre. The total number of professional nurses working in operating theatre and labour ward were thirty two (32) (fifteen (15) professional



nurses working in operating theatre and seventeen (17) professional nurses working in labour ward). The researcher decided to include all of them in the sample.

## RESEARCH INSTRUMENT

The means of obtaining the desired information was through questionnaires, the structured interview schedule and the observation checklist. The questionnaires were used to collect data from professional nurses working in operating theatre and labour ward. The questionnaire was chosen for collecting data from professional nurses because it is less expensive than other instruments pertaining to time and money. It also enables respondents to provide honest responses. The questionnaire is also an easier tool for collecting data in a large group of personnel as the researcher distributed and collected them personally. The structured interview schedule was used to collect data from sixteen (16) patients who developed post caesarean section wound sepsis. The structured interview schedule enabled the investigator to get more information from respondents as the questions were open ended and allowed them to elaborate. The observation checklist was used to collect data from records of patients who developed post caesarean section wound sepsis. The observation checklist was used to complement the information that was gathered during the structured interview. Some of the information from the patients on interviews, such as indications for a caesarean section cannot be clearly explained by the patients.

### Development of the questionnaire

The questionnaire was utilised based on the objectives of the study and specific information sought.

Selected questionnaires were examined and literature on labour ward and operating theatre practice were read in order to extract relevant aspects of research. The

questionnaire developed by Hillan (1995) formed the basis of some of the items in the questionnaires.

The questionnaires were then fully developed. The structured interview was used to obtain objective data from patients with post caesarean section wound sepsis. The observation checklist was used to collect data from records of patients with post caesarean section wound sepsis.

#### Design of the questionnaire to professional nurses

Two (2) questionnaires were used to collect data from professional nurses working in operating theatre, labour ward and post caesarean section unit. The first questionnaire was designed for professional nurses assigned to the labour ward. It consisted of three sections. Section A consisted of items which elicited information on professional background. Section B contained aspects on labour ward practice and Section C comprised of aspects on post caesarean section unit practice.

The second questionnaire was designed for professional nurses working in the operating theatre. It was structured into two sections. Section A comprised of professional background information and Section B consisted of operating theatre practice. The questionnaire comprised of closed and open ended questions.

#### Design of observation checklist

The observation checklist was designed to obtain information from records of patients who developed post caesarean section wound sepsis. It comprised of items which elicited information on risk factors of post caesarean section wound sepsis and implications of post caesarean section wound sepsis.

### Design of structured interview schedule

The structured interview schedule was designed for patients who developed post caesarean section wound sepsis. It consisted of closed and open ended questions to obtain information on risk factors and implications of post caesarean section wound sepsis.

### Pilot Study

Pretesting of questionnaires was undertaken before distribution. The purpose of pretesting was done to estimate any ambiguous questions to improve response options and to establish content validity.

Pretesting consisted of twentyseven (27) respondents, of whom nine (9) were finalists bridging course nursing students who have worked in operating theatre, nine (9) professional nurses who have worked in labour ward and nine (9) patients who had undergone caesarean section between 1992 and 1993. All questionnaires were filled in, in the presence of the investigator as the objective was to discuss the individual remarks of the respondents. The content was relevant to the research problem. The questionnaires were modified. The structured interview schedule was modified as the respondents revealed that it was too long as it took fifteen (15) minutes. The structured interview schedule and checklist was discussed with experts in obstetrics.

### Validity and reliability

Nine professional nurses were selected for the pretest and were furthermore requested to examine the items of the questionnaire and estimate the content validity of the instrument on basis of their experiences. The variety of experts consulted in the field of health care in relation to the questionnaire supported the validity of the information used. The following members of the health team were consulted:-



- two obstetricians made their comments in relation to the items included
- two general surgical practitioners also made their comments on general items for investigation of risk factors of post caesarean section wound sepsis
- a nursing leader in Nursing Administration the Nursing Service Manager who is in charge of the institution.

Content validity confirms the representatives of items to measure what they are supposed to measure and is an important characteristic of research instruments and questionnaires (Treece & Treece, 1986:127).

Reliability is another important characteristic of a research instrument. Reliability refers to the degree of consistency or accuracy with which the instrument measures an attribute (Treece & Treece 1986:119; Polit & Hunglar, 1987:406). In this study, the reliability of the instrument was ensured by the fact that the respondents who participated in the pretest had the same characteristics as the participants in the principal study.

## COLLECTION OF DATA

### Ethical consideration

Ethical considerations are important as the study is concerned with personal and professional data.

The permission to conduct the study was obtained from the KwaZulu-Natal Department of Health. A prescribed form for requesting permission to conduct research in KwaZulu-Natal hospitals was completed by the researcher and the supervisor, this was approved by the Medical Superintendent of the hospital under study. See Annexure A and B.



The aim of the research study was explained to the participants by the researcher. Informed consent was obtained from respondents. According to Polit & Hungler, (1987:529) and Treece & Treece, (1986:98) prospective participants must be informed and their voluntary consent secured. All respondents were assured of confidentiality and anonymity. No names were to appear on data collected instead numbers were used.

#### Time spent in collecting data

The researcher distributed questionnaires in August 1996 and collected them in October 1996. Data was collected from seventeen (17) labour ward professional nurses. Out of seventeen (17) questionnaires, thirteen (13) (76%) were returned. Fifteen (15) questionnaires were submitted to the operating theatre professional nurses. They all returned the questionnaires. The patients who developed post caesarean section wound sepsis whose records were reviewed utilising the checklist were sixteen (16). The researcher also conducted interviews to sixteen (16) patients who developed post caesarean section wound sepsis. Interviews were conducted in Zulu to enable participants to understand questions and to give relevant information. The interviews were conducted privately to participants and lasted for fifteen (15) minutes for each interview.

TABLE 3.1: THE TOTAL NUMBER OF PROFESSIONAL NURSES WHO PARTICIPATED IN THE STUDY AND THE RESPONSE RATE

STATUS OF QUESTIONNAIRE	NUMBER RESEARCHED	PERCENTAGE
Distributed	32	100
Returned	28	88
Analysed	28	88

Table 3.1 shows 28 (88%) as a very good return rate because the researcher personally distributed and collected the instruments. Therefore eighty eight percent (88%) of responses were analysed.

#### PLANNING FOR ANALYSIS OF DATA

Data from closed and open ended questions from questionnaires and data from observation checklist and data from structured interviews were manually sorted and presented in the form of tables.

#### CONCLUSION

In this chapter the researcher has reported on the research methodology. The descriptive survey was used for collection of data through questionnaires, structured interview schedule and observation checklist. The information gathered is going to be analysed and described in chapter four.

## CHAPTER 4

### ANALYSIS AND DISCUSSION OF FINDINGS

#### INTRODUCTION

This chapter gives an overview of the incidence and risk factors of post caesarean section wound sepsis in Hlabisa Hospital and the implications to patients. It highlights the contributory risk factors of post caesarean section wound sepsis as related to patient, environment and professional nurses. The data obtained from the professional nurses working in labour ward, operating theatre and post caesarean section unit will be analysed and interpreted. This chapter will also address ideas and information obtained from the patients' records and patients interviews. Tables and graphs will be used.

#### INCIDENCE OF POST CAESAREAN SECTION WOUND SEPSIS IN HLABISA HOSPITAL

TABLE 4.1: INCIDENCE OF RESPONDENTS WITH POST CAESAREAN SECTION WOUND SEPSIS

RESPONDENTS	FREQUENCY	PERCENTAGE
June 1995 to July 1996	815	100
Nonseptic caesarean section patients	809	98
Septic caesarean section patients	16	2

Table 4.1 shows that out of 815 (100%) patients who underwent caesarean section between July 1995 to July 1996, 16 (2%) developed post caesarean section wound sepsis. This shows that there has been no increase when comparing the statistics of



January 1994 to June 1995 which was also 2%. According to Baker (1990) the incidence of 2% is acceptable. The success in keeping post caesarean section wound sepsis at the rate of 2% is probably due to various efforts made by the institution to prevent and eliminate wound sepsis. Probably it is due to the effective implementation of Hlabisa Hospital policy by all health professionals.

## ANALYSIS, INTERPRETATION AND DISCUSSION ON VIEWS OF PROFESSIONAL NURSES ON LABOUR WARD AND OPERATING THEATRE PRACTICE

An overview of professional nurses allocated in labour ward and operating theatre in Hlabisa Hospital is analysed. The enquiry to the professional nurses practice was of significance since professional nurses are responsible for the management of patients for twenty four (24) hours. It was also of significance because of the factors that cause wound infection to post caesarean section patients, which may be associated with the way the professional nurses carry out their nursing management activities. Professional nurses are regarded as knowledgeable, skilled and competent health professionals capable of implementing measures of controlling wound sepsis.

Seventeen questionnaires were administered by the researcher to the professional nurses working in the labour ward. Thirteen (76%) professional nurses returned the questionnaires. According to Babbie (1993:65) a response rate of at least 50% is adequate and a rate of 76% is very good.

## THE VIEWS OF PROFESSIONAL NURSES WORKING IN LABOUR WARD

### Qualifications of labour ward professional nurses

Information on professional nurses qualifications was sought. This was of significance since only nurses registered with the South African Nursing Council (as stipulated in

Nursing Act No. 50 of 1978 (as amended) as midwives are allowed to manage pregnant mothers until they give birth.

#### Key to qualifications

R N = Registered nurse

R M = Registered midwife

A D M = Advanced diploma midwife

TABLE 4.2: LABOUR WARD PROFESSIONAL NURSES QUALIFICATION

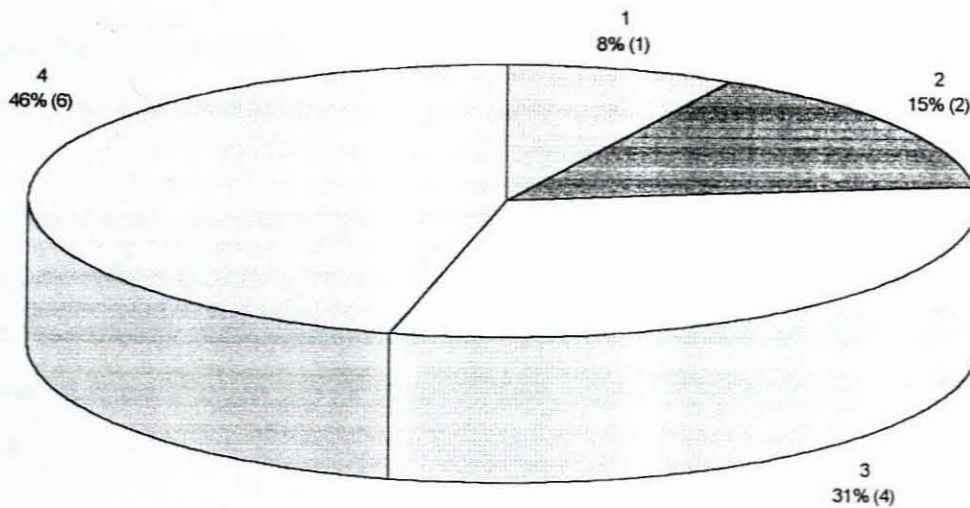
PROFESSIONAL QUALIFICATIONS	NURSES	FREQUENCY	PERCENTAGE
R/N & R/M		11	85
R/M		2	15
ADM		2	15

Table 4.2 shows that 13 (100%) professional nurses who returned questionnaires had midwifery certificates and 2 (15%) had an additional qualification of advanced diploma in midwifery. This suggests that risk factors that predispose to post caesarean section wound sepsis could be identified and treated early, through decision making of competent midwives working in labour ward. The personnel related as well as environmental related factors may be controlled or eliminated through appropriately qualified personnel allocated in labour ward and one would therefore expect less wound sepsis.

#### Number of years professional nurses have worked in labour ward

The experience of professional nurses was important in prevention of wound infection. The professional nurses were requested to indicate the number of years they have spent working in the labour ward.

FIGURE 4.1: NUMBER OF YEARS PROFESSIONAL NURSES SPENT WORKING IN LABOUR WARD N=13



#### KEY

- 1 = 1-2 years and under
- 2 = 3-5 years
- 3 = 6-8 years
- 4 = 9 years and above

Figure 4.1 illustrates that 46% of respondents stated that they have worked in labour ward for 9 years and above, whilst 31% of respondents stated that they have an experience of 6-8 years of service as labour ward professional nurses. Findings possibly indicate that they have the necessary experience to manage patients in labour ward. These professional nurses are able to minimise or eliminate patient related factors such as prolonged labour. Factors such as failure to adhere to aseptic technique principles and factors such as a filthy environment in the labour ward are eliminated. Moir-Bussy & Thompson, (1984:362) mention that the experience of a surgeon is important in the prevention of wound sepsis. The labour ward experience



of a professional nurse is also important because it empowers her with skills in prevention of post caesarean section wound sepsis; early identification and management of those patients who are developing post caesarean section wound sepsis.

Aseptic technique principles to be followed when performing vaginal examination for a patient in established labour

The aim was to ascertain whether labour ward professional nurses do contribute to personnel related factors of wound infection during vaginal examination. Respondents were requested to state aseptic technique principles to be followed when performing vaginal examination to a patient in established labour. The following responses were given:

TABLE 4.3: PRINCIPLES OF VAGINAL EXAMINATION

PRINCIPLES	FREQUENCY	PERCENTAGE
Using a sterile vaginal pack for each vaginal examination	11	85
Performing 2 hourly vaginal examination for a patient in established labour	11	85
Using general purpose gloves for sneak vaginal examination	2	15

Table 4.3 reveals the following:

#### Using sterile vaginal pack

The findings show that 11 (85%) respondents stated that aseptic technique principle for performing a vaginal examination is that a sterile vaginal pack is used for each vaginal examination. These findings indicate that the professional nurses are following the aseptic technique principle during performance of a vaginal examination by using a

sterile pack for each vaginal examination. Hlabisa Hospital labour ward and operating theatre policy (1992) maintain that aseptic technique principles must be maintained during vaginal examination to prevent infection which could lead to post caesarean section wound infection.

#### Performing 2 hourly vaginal examination for a patient in established labour

Findings show that 11 (85%) professional nurses perform 2 hourly vaginal examination in patients who are in established labour. This is done to control wound sepsis in post caesarean section patients. Sellers (1993:1320) maintains that vaginal examination is performed 2 hourly on patients in established labour. This is because frequent vaginal examination exposes the woman in labour to entry of micro-organisms through the vaginal canal. According to these results one would expect less post caesarean section wound sepsis.

#### Using general purpose gloves for sneak vaginal examination

Findings show that 2 (15%) respondents stated that they use general purpose gloves for performing sneak vaginal examination. The sneak vaginal examinations are never recorded, therefore one can never tell how many vaginal examinations have been performed. This exposes the patient to many vaginal examinations which are likely to cause vaginal infection. Despite the small number of professional nurses ((2) 15%) who perform sneak vaginal examination, those women who are exposed to sneak vaginal examination will be at risk of getting wound infection after they have had caesarean section. It is of great concern that the policy of the institution under study does not emphasise that sneak vaginal examination must not be performed by professional nurses. The policy only states that 2 hourly vaginal examination must be performed for those patients in established labour.

#### Method used for confirmation of diagnosis of prelabour rupture of membranes

This item is of importance in identifying whether professional nurses do monitor the duration of rupture of membranes. The investigator wanted to ascertain whether professional nurses are using the correct method of confirming diagnoses of prelabour rupture of membranes, which will prevent entry of micro-organisms through the vaginal canal and aid in giving the duration of rupture of membranes.

Responses were as follows:-

TABLE 4.4: CONFIRMATION OF DIAGNOSIS OF PRELABOUR RUPTURE OF MEMBRANES

CONFIRMATION OF DIAGNOSIS	FREQUENCY	PERCENTAGE
A sterile vaginal speculum is used	12	92
A sterile gloved hand is used	11	85

Table 4.4 reflects that 92% of respondents stated that the sterile vaginal speculum is used for confirmation of diagnosis of prelabour rupture of membranes. Eighty five percent of respondents stated that a sterile gloved hand is used during confirmation of diagnosis of prelabour rupture of membranes. Findings are reflecting that there is less likelihood that the patients will be exposed to vaginal infection that could lead to post caesarean section wound sepsis.

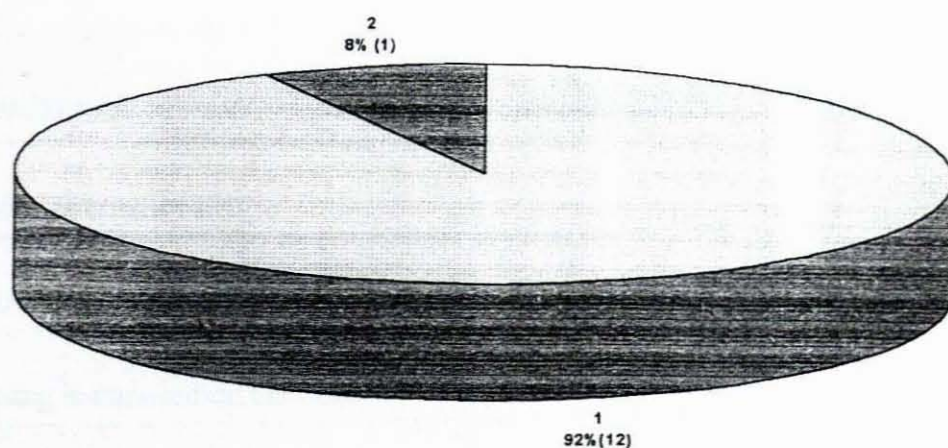
#### Method used for rupturing membranes in a patient in labour

The respondents were further asked to indicate the method used for rupturing membranes in a patient in labour. This is of importance because methods such as use of inadequately sterilised equipment for artificial rupture of membranes may predispose



to post caesarean section wound infection (Larsen, 1993:27). The responses were as follows:

FIGURE 4.2: PIE CHART ON METHOD USED FOR RUPTURING MEMBRANES IN A PATIENT IN LABOUR



#### KEY

- 1 = Sterile amniotic hook
- 2 = injection needle

The illustration in Figure 4.2 reflects that 92% of respondents indicated that they are using sterile amniotic hooks for rupturing membranes artificially in a patient in labour. Eight percent (8%) of respondents stated that they used a sterile injection needle for rupturing membranes when the membranes are adherent to the presenting part. Findings reflect that the professional nurses are using the correct methods of rupturing membranes. Sellers (1993:640) maintains that the use of amniotic hook or kocher forceps do not contribute to vaginal infection, but does not state the use of a sterile injection needle.

### Principles of wound dressing according to the policy of this hospital

The respondents were requested to list principles of wound dressing that they are implementing according to the policy of the hospital, in order to ascertain whether they are utilising the correct principles of wound dressing. Respondents gave the following responses:

TABLE 4.5: PRINCIPLES OF WOUND DRESSING

PRINCIPLES	FREQUENCY	PERCENTAGE
Emphasize handwashing	1	8
Adhere to aseptic technique	6	46
Dressing is removed on third day	11	85
Clean sutured wound with hibitane 0,5% in 70% alcohol	10	77
Paint open wound with mercurochrome from third day	7	54
Dress wounds after cleaning the floor	5	38
Dress clean wounds first	2	15
Separate patients with septic wounds from those with clean wounds	2	15
Emphasize personal hygiene	2	15

Table 4.5 shows that 85% of respondents stated that patients with caesarean section have their wound dressings removed on the third day, while 77% of respondents stated that patients with opened sutured wounds have their wounds cleaned with Hibitane 0,5% in 70% alcohol. Forty six percent (46%) of respondents stated that adherence to principle of aseptic technique wound dressing for patients with post caesarean section wound is undertaken as a preventive measure of wound infection. These findings reveal that professional nurses do observe aseptic technique principles. These findings are supported by Hawrylynsh *et al*, (1981:297) who maintain that strict adherence to aseptic technique lowers the incidence of wound infection. It is of great concern that (1) 8% of respondents emphasised handwashing. Handwashing is part of personal hygiene. One would expect all professional nurses to emphasise handwashing as the most important principle of wound dressing. After attending to every patient a nurse is expected to wash hands before attending to the next patient. Failure to emphasise handwashing as a principle of wound dressing might be an indication that nurses are contributing to transfer of micro-organisms from one patient to the other. According to Ziady, Small & Louis, (1997:60) the important control measure against spread of infection is handwashing. They further emphasise that hands should not be washed by soap alone but a disinfectant be used. During washing special attention is paid to palms, back of the hands and between fingers.

#### Principle of environmental control in relation to the floor

This was aimed at obtaining the correct information from the respondents concerning the cleaning of the floor in the ward, which is likely to remove microbes that possibly cause wound infection. Respondents were requested to give their views. The following responses were obtained.



TABLE 4.6: PRINCIPLES OF ENVIRONMENTAL CONTROL IN RELATION TO THE FLOOR

PRINCIPLE	FREQUENCY	PERCENTAGE
The floor is cleaned with 2 bucket system. One bucket with biocide D solution and second bucket with rinsing water.	13	100
The broom is never used in the ward	2	15
The floor is cleaned regularly	2	15

Table 4.6 depicts that all (100%) respondents stated that a two bucket system is utilised to ensure adequate cleaning of the floor with biocide D solution and rinsing water in the second bucket. This suggests that most microbes are destroyed by using biocide D solution, which is a disinfectant capable of minimising environmental related risk factors of wound infection, in post caesarean section patients. Only 2 (15%) respondents stated that the floor was cleaned regularly. This is of great concern because professional nurses should all emphasise the regular cleaning of the floor as they are to supervise the ward aides and encourage them to clean the floor regularly. This means that periodic evaluation of environmental control measures need to be undertaken so as to eliminate environmental related risk factors of wound infection.

#### Principle of environmental control in relation to dusting and dusting cloths

Respondents were further requested to give their views on the principle of ward environmental control in relation to dusting and dusting cloths. The aim was to find

out whether professional nurses are practising the correct method of damp dusting. Respondents gave the following views.

TABLE 4.7: PRINCIPLE OF ENVIRONMENTAL CONTROL IN RELATION TO DUSTING AND DUSTING CLOTHS

PRINCIPLE	FREQUENCY	PERCENTAGE
Biocide D spray solution is used for damp dusting	11	85
Soap and water is used during damp dusting	2	15
Dusting cloths are used during damp dusting	13	100
Dusting cloths are washed with soap and water	13	100
Dusting cloths are dried in the sun	7	54
Dusting cloths are kept dry	6	46

Table 4.7 reflects that all (100%) respondents stated that dusting cloths are used for damp dusting and which indicated that they are not contributing to spread of micro-organisms that cause wound infection in post caesarean section patients.

Eleven (85%) respondents stated that biocide D spray solution was used for damp dusting. Findings reveal that most of the professional nurses were adhering to the policy of the institution. According to the policy of the institution biocide D solution is used for damp dusting. Findings are confirmed by Sibisi (1992:2) who maintains that a disinfectant must always be used for damp dusting as it destroys micro-organisms.

Two (15%) professional nurses stated that they use soap and water for damp dusting which indicates that they are not adhering to the policy. It is of great concern that 6 (46%) respondents stated that damp dusting cloths are kept dry whereas 7 (54%) respondents did not state how damp dusting cloths are stored after use. Findings show that professional nurses have inadequate knowledge of what should be done during and after damp dusting. This implies that even the supervision of those doing damp

dusting is inadequate which means that there is poor environmental control. According to the institutional policy (1992) damp dusting cloths are washed with soap and water after use, dried and stored dry.

THE VIEWS OF PROFESSIONAL NURSES ON OPERATING THEATRE PRACTICE

Questionnaires were administered by the researcher to fifteen (15) professional nurses working in operating theatre, who all returned the questionnaires.

Qualifications of professional nurses

The professional nurses were requested to state their professional qualifications. The researcher wanted to identify the number of nurses registered with the South African Nursing Council in Diploma in Operating Theatre Nursing Science under the conditions stated in the Nursing Act (Act No. 50 of 1978). These nurses are considered to be skilled, competent and safe practitioners.

The following information was obtained.

TABLE 4.8: QUALIFICATIONS OF OPERATING THEATRE PROFESSIONAL NURSES

QUALIFICATIONS	FREQUENCY	PERCENTAGE
Registered nurses	12	80
Registered midwives	2	13
Advanced diploma midwives	1	7
TOTAL	15	100

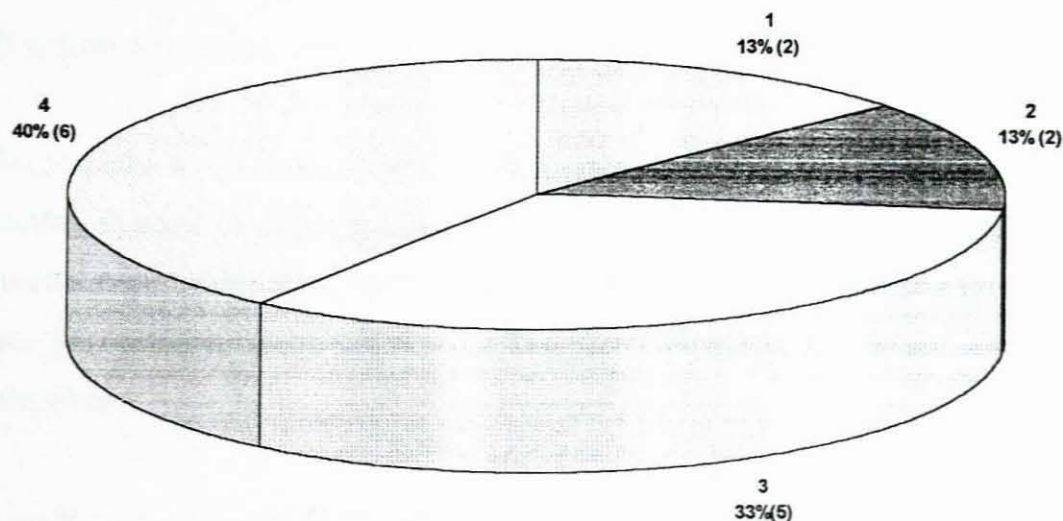


Table 4.8 shows that 12 (80%) respondents were registered professional nurses, 2 (13%) were registered midwives and only 1 (7%) had an advanced diploma in midwifery. The results show that nurses working in the operating theatre are registered nurses and midwives and therefore have a basic knowledge of working in operating theatre. They possess the basic skills of controlling environmental, personnel and patient related factors that might lead to post caesarean section wound infection to those patients who might have caesarean section performed. Such qualified professional nurses possess adequate knowledge of infection control practices that form the basis of safe patient care and professional safety. Effective supervision of general assistants on environmental hygiene is possible under properly qualified professional nurses. One would therefore expect less post caesarean section wound sepsis. Findings are supported by Searle (1985:48), who maintains that qualifications of a nurse have a major impact in her unit functions. However the results reveal that there was no professional nurse with additional qualification in the operating theatre. This is of great concern, because a nurse with additional qualifications in operating theatre nursing, is better equipped with knowledge of operating theatre infection control practice, such as supervision of the surgical team, on adherence to the operating theatre policy on prevention of infection.

#### Number of years professional nurses have worked in operating theatre

Professional nurses were further requested to indicate the years they have spent working in operating theatre. The aim was to obtain the information on professional nurses experience which might be a basis of their ability to control or prevent wound infection.

FIGURE 4.3: PIE GRAPH ON NUMBER OF YEARS PROFESSIONAL NURSES HAVE WORKED IN OPERATING THEATRE



#### KEY

- |   |   |                   |
|---|---|-------------------|
| 1 | = | 1-2 years         |
| 2 | = | 3-5 years         |
| 3 | = | 6-8 years         |
| 4 | = | 9 years and above |

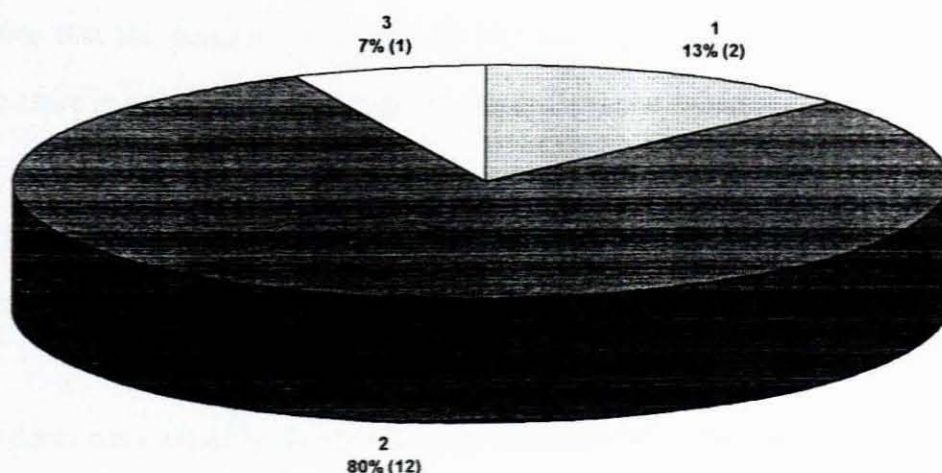
Figure 4.3 reveals that 6 (40%) professional nurses stated that they have worked in operating theatre for 9 years and above, 5 (33%) indicated that they have worked in operating theatre for 6-8 years. The findings reveal that the professional nurses have adequate experience in operating theatre practice. This suggests that wound infection will be controlled since experienced professional nurses use various strategies in preventing and controlling factors that predispose to post caesarean section wound infection. Moir-Bussy et al, (1984:366) stated that the experience of a surgeon is

important in preventing wound infection, the experience of a professional nurse is similarly viewed as important. Probably the experience is important as it widens the knowledge of the individual on risk factors of post caesarean section wound sepsis and on methods of preventing and controlling those risk factors.

#### First Item worn when wearing theatre attire on entering operating theatre

Respondents were asked to give their views on item worn first on entering operating theatre, in order to obtain the correct practice that would prevent contamination of theatre attire, which bring microbes from outside the operating theatre environment into the operating theatre which could lead to wound infection. The following data was given:

FIGURE 4.4: PIE GRAPH ON ATTIRE THAT IS WORN FIRST WHEN WEARING THEATRE GARB ON ENTERING THEATRE AND REASONS FOR THE RESPONSES



#### **KEY**

- 1 = theatre dress/trouser/shirt
- 2 = theatre cap
- 3 = overshoes/clogs



Figure 4.4 indicates that 12 (80%) respondents stated that they wear the theatre cap first in order to prevent shedding of microbes from hair to the clean theatre attire. Wearing of the operating theatre cap first is aimed at prevention of transfer of the micro-organisms from hair to personnel to the operating theatre environment, and to the patients during operation. Two (13%) respondents stated that they wear the theatre dress, shirt or trouser first in order to wear fast, while 1 (7%) respondent indicated that overshoes or clogs are worn first for convenience. Findings show that these professional nurses lack knowledge of the total use of the theatre attire because they are not sure of what is to be worn first when wearing theatre attire. Findings also indicate that respondents are not aware of the importance of wearing theatre attire correctly. This is of great concern because professional nurses can transfer micro-organisms to the operating theatre, which would contribute to contamination of theatre environment thus predisposing to caesarean section wound sepsis. Effective prevention and control of personnel and environmental factors that contribute to wound sepsis, depends on the knowledge of the whole surgical team on the correct way of wearing theatre attire. This idea is confirmed by Nightingale (1987:14) who maintains that the surgical team must be familiar with the correct way of wearing theatre attire in order to display a high standard of infection control.

#### What the professional nurses should bear in mind when doing effective surgical handwashing procedure and reasons for responses

Respondents were asked to indicate what is to be borne in mind when doing effective surgical handwashing procedure, in order to obtain the correct practice of surgical handwashing procedure. The correct practice would be prevention of transferring micro-organisms from professional nurses hands to the patients. The responses were as follows:

TABLE 4.9: PRINCIPLES PROFESSIONAL NURSES SHOULD BEAR IN MIND FOR EFFECTIVE HANDWASHING PROCEDURE

PRINCIPLES	PERCENTAGE
Free running tapwater must be available	80
Hibiscrub to be used during surgical handwashing procedure	72
Jewellery must be removed during surgical hand washing procedure	72
The surgical handwashing procedure must be done for 5-7 minutes	80
All steps must start from the hands during the procedure	88
Arms must be always be higher than elbows	72
Use sterile nail brush	72

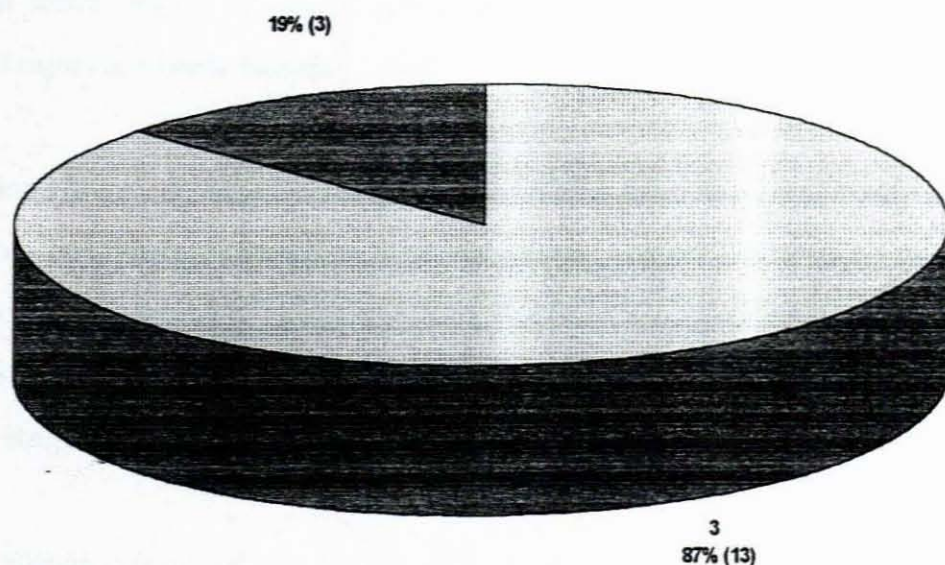
Table 4.9 reveals that 88% of respondents stated that all steps must start from the hands during handwashing procedure in order to allow easy flow of dirt down the forearms and also to prevent moving dirt from the forearms to the hands. Eighty percent (80%) of respondents stated that they wash hands for 5-7 minutes for thorough surgical handwashing that would remove most microbes from the hands of professional nurses. The findings suggest that the professional nurses are adhering to the policy of surgical handwashing in order to eliminate the number of micro-organisms which might be transferred from hands of nursing staff to the patients incision during the operation. Hands as indicated by Babb (1996:5) are one of the routes through which infection is spread. Surgical handwashing procedure in this study is known and practised by all health professionals in order to prevent cross

infection. Washing the hands is the single most important preventive control measure against the spread of infection from patient to health professionals. This is significant because disinfection of hands is indicated before and after contact with the patient, his or her direct environment. In operating theatre hands should be disinfected as an additional measure of control of infection before putting on and after removal of unsterile gloves (Ziady, Small & Louis, 1997:50).

The commonly practised skin preparation of a patient for proposed caesarean section

Respondents were asked to state their views pertaining to skin preparation, the aim was to identify whether professional nurses were performing skin preparation according to the operating theatre policy.

FIGURE 4.5: PIE GRAPH ON SKIN PREPARATION FOR A PROPOSED CAESAREAN SECTION PATIENT



**KEY**

1 = xiphisterum to pubis

2 = xiphisternum to mid thighs



3 = xiphisternum to mid thighs

4 = umbilicus to mid thighs

As illustrated in Figure 4.5 thirteen (81%) respondents indicated that skin preparations for a proposed caesarean section involve cleaning the patients skin from the xiphisternum to midthighs while 3 (19%) respondents stated that the patients skin was prepared from the umbilicus to midthighs. Results suggest that professional nurses are preparing the patients skin in a way that would reduce micro-organisms, that would cause wound sepsis. Confirming these findings is Atkinson & Kohn, (1978:60) who indicate that the area from the xiphisternum to midthighs including the umbilicus should be thoroughly cleaned to prevent cross infection.

## ANALYSIS AND DISCUSSION OF DATA FROM PATIENTS INTERVIEWS

This chapter presents an overview of risk factors and implications of post caesarean section wound sepsis as viewed by patients who have had post caesarean section wound sepsis at Hlabisa Hospital.

Interviews were conducted on sixteen (16) patients who developed post caesarean section wound sepsis. Statistical measures include frequency distribution tables and graphs. It was necessary to obtain information from these patients as they were the people who had a true picture of how post caesarean section wound sepsis affected them. Responses obtained from patients interviews are outlined.

### Socio-economic status of respondents and their spouses

Obtaining the socio-economic status of respondents and their spouses was going to indicate whether they were employed or unemployed. This information would assist in identifying whether they were able to fulfil their basic needs for an appropriate health status which is a preventive factor against post caesarean section wound sepsis.

TABLE 4.10(a): SOCIO ECONOMIC STATUS OF RESPONDENTS

N = 16

SOCIO-ECONOMIC STATUS	FREQUENCY	PERCENTAGE
Employed	5	31
Unemployed	11	69
TOTAL	16	100

TABLE 4.10(b): SOCIO-ECONOMIC STATUS OF RESPONDENTS

SPOUSES N = 16

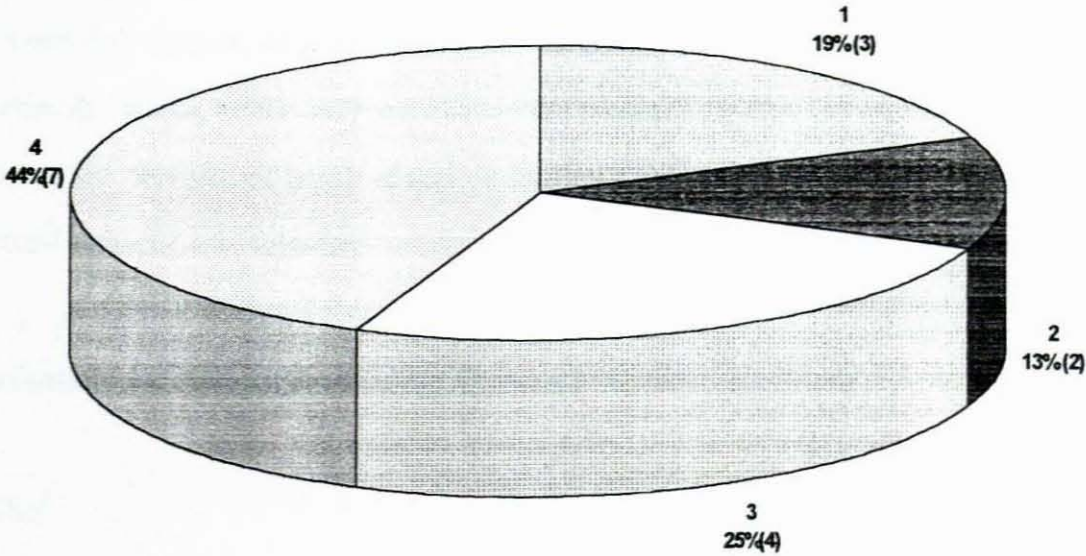
SOCIO-ECONOMIC STATUS	FREQUENCY	PERCENTAGE
Employed	6	37
Unemployed	10	63
TOTAL	16	100

Table 4.10(a) and 4.10(b) show that 11 (69%) respondents and 10 (63%) respondents spouses were unemployed. This indicates that the majority of patients who developed post caesarean section wound sepsis at Hlabisa Hospital were those who had a low standard of living. This is significant because people with a low standard of living are usually unemployed and exposed to poverty, and therefore unable to meet the basic needs such as nutrition. This further exposes the individuals to lowered resistance to infection. The socio-economic status of respondents therefore is a risk factor. These findings are confirmed by Magann *et al* (1993:925) who maintain that pregnant women with a low socio-economic status are likely to develop wound infection after caesarean section.

Proximity to the nearest clinic or hospital

It was important to request information on the proximity to the nearest clinic or hospital from respondents, in order to identify whether respondents attend the antenatal care early, for identification of pregnancy related problems, that could lead to post caesarean section wound sepsis. Responses were as follows:

FIGURE 4.6: PROXIMITY TO THE NEAREST CLINIC OR HOSPITAL



**KEY**

- 1 = 500 metres - 3 kilometres
- 2 = 4-6 kilometres
- 3 = 7 - 9 kilometres
- 4 = 10-12 kilometres



Figure 4.6 depicts that 7 (44%) respondents stated that they travelled a distance between 10-12 kilometres to reach a nearest clinic or hospital for health service. The results show that they were far from the clinic because according to the World Health Organisation clients must not be more than 7 kilometres away from the health clinic or hospital for regular antenatal care attendances. The respondents further stated that on rainy days because the road is muddy and bad, transport was not available. This contributes to inaccessibility of the clinic, which makes them unable to attend the antenatal clinic on scheduled periods. This suggests that some of these respondents went into labour without being assessed and risk factors such as adequacy of the pelvis and health education on certain conditions which may expose them to wound infection if a caesarean section is performed (such as prevention and treatment of sexually transmitted diseases, anaemia and diabetes) are identified. Findings are confirmed by Green & Sarubbi, (1977:687) and Nielsen & Hokegard, (1982:913) who maintain that clients are deprived of health education lessons and health assessment if they do not attend antenatal care regularly.

#### Indications for caesarean section as risk factors

##### **KEY**

C.P.D.	=	Cephalopelvic disproportion
Failed v.e.	=	Failed vacuum extraction
F.D.	=	Foetal distress
P.I.H.	=	Pregnancy induced hypertension

This information is of significance because some of the indications for caesarean section expose women to wound infection.

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TABLE 4.11: INDICATIONS FOR CAESAREAN SECTION AS RISK FACTORS

= 16

INDICATIONS	FREQUENCY	PERCENTAGE
C.P.D.	8	50
Previous caesarean section	3	19
Failed vacuum extraction	1	6
F.D.	1	6
P.I.H.	1	6
Malpresentation	2	13
TOTAL	16	100

Table 4.11 revealed that some indications for caesarean section expose patients to post caesarean section wound sepsis as shown by the interviewed patients.

#### Cephalopelvic disproportion

Eight (50%) respondents on interview stated that caesarean sections were performed because their babies were big. Their records indicated that they had caesarean section for cephalopelvic disproportion. This shows that cephalopelvic disproportion prolongs labour and frequent vaginal examinations are likely to be performed thus exposing patients to entry of micro-organisms through the vaginal canal. These findings are confirmed by Nielsen & Hokegard (1982:910) who maintain that in cephalopelvic disproportion the presenting part remains either at or below the ischial spines for



sometime and the risk of developing post caesarean section wound sepsis is high if a caesarean section is performed.

#### Previous caesarean section

Three (19%) respondents interviewed stated that they developed wound infection after a repeat caesarean section. Probably these patients became infected because patients with previous caesarean section are sometimes exposed to trial of labour which prolongs labour. Sellers (1993:291) who highlight that a caesarean section is performed after termination of trial of labour when labour is found to be prolonged.

#### Malpresentation

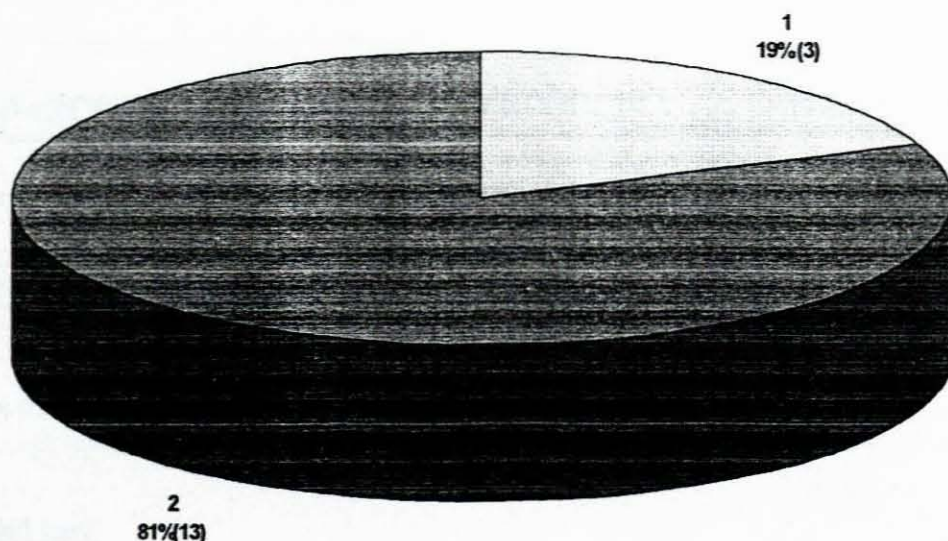
Two (13%) respondents revealed that caesarean section were performed for malpresentation. Their records showed that the indication for performance of caesarean section were twin pregnancy and transverse lie. Quite often patients who present with malpresentation are exposed to prolonged or obstructed labour which end up in a caesarean section. According to Sellers, (1993:1250) patients with prolonged labour due to malpresentation and twin pregnancy are at risk of developing infection. Therefore patients with twin pregnancy and malpresentation are exposed to wound infection due to prolonged labour.

#### Number of patients with previous caesarean section

Respondents were requested to state on interview whether they were exposed to previous caesarean section, to ascertain whether the caesarean section that was

followed by wound infection was performed for the first time or was a repeat caesarean section.

FIGURE 4.7: NUMBER OF PREVIOUS CAESAREAN SECTION



#### KEY

1 = Previous caesarean section

2 = Caesarean section performed for the first time

Figure 4.7 illustrates that 13 (81%) respondents had caesarean section performed for the first time while 3 (19%) respondents had previous caesarean section. Because most patients who had caesarean section performed for the first time developed wound infection, previous caesarean section is therefore not a risk factor for post caesarean section wound infection. These findings are supported by Moir-Bussy *et al* (1984:361) who are of the opinion that a relationship does not exist between previous caesarean section and the incidence of wound infection.

### Guidance or instructions given to patients on discharge

Obtaining this information would elicit the advice that was given to the respondents on discharge, to prevent wound sepsis at home. Responses were:

TABLE 4.12: GUIDANCE OR INSTRUCTIONS GIVEN TO PATIENTS ON DISCHARGE = 16

GUIDANCE	FREQUENCY	PERCENTAGE
Wound care	13	81
Family planning	12	75

Table 4.12 reveals the following:

#### Wound care

Findings show that 13 (81%) respondents interviewed were given instructions on wound care. Respondents were further requested to state what was specifically given to them about wound care.

Seven (44%) out of 13 (81%) respondents stated that they were taught to wear clean clothes daily to prevent entry of micro-organisms to the wound while 4 (25%) out of 13 (81%) respondents were instructed to report to the nearest clinic or hospital for removal of sutures and dressing of abdominal wounds. Two (13%) out of 13 (81%) respondents on interview stated that they were advised not to touch the wound nor allow water to enter the wound during washing of the body. Findings show that professional nurses gave inadequate information on wound care. The respondents should have been given advice on aspects such as adequate nutrition, which is rich in protein such as fish, beans, eggs and meat as well as vitamin C such as citrus fruits



which is found in oranges and tomatoes. These aspects are of significance to build the body's resistance against post caesarean section wound sepsis. They were further supposed to have been advised to report at the clinic the symptoms of post caesarean section wound sepsis such as any abnormal discharge, pain or gaping of the wound. Findings are confirmed by Naumann, Haulth, Hodkins & Lincoln (1995:413) who maintain that wound care guidance should be given to respondents adequately to prevent post caesarean section wound sepsis.

### Family planning

Twelve (75%) respondents further stated that they were given instructions on family planning such as to avoid to have babies for at least three years to allow adequate healing of abdominal scar. It is through family planning practices that the physical health of child bearing women is maintained. Larsen (1995:20) is of an opinion that the life expectancy and health of the women is improved by spacing the births of their children through family planning advices.

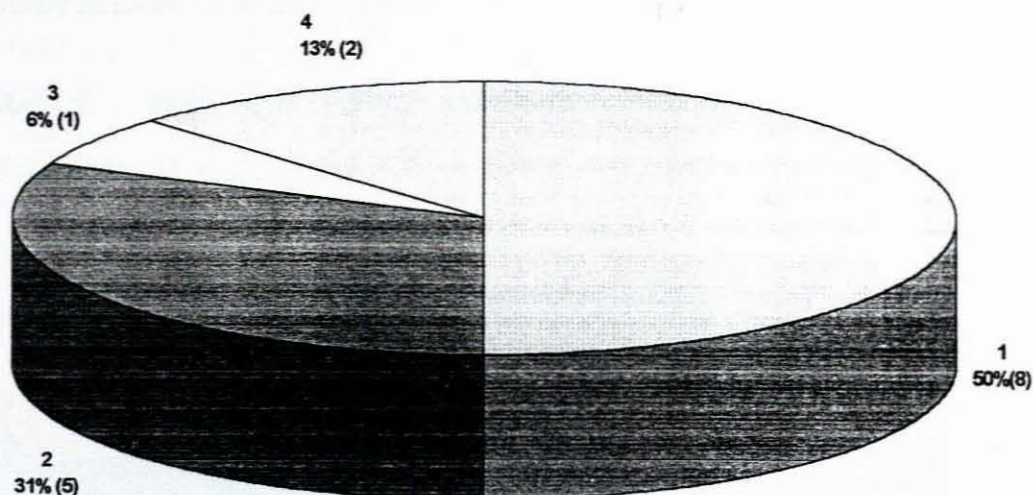
## CHECKLIST ON RECORDS OF PATIENTS WHO DEVELOPED POST CAESAREAN SECTION WOUND SEPSIS

This chapter present analysis, interpretation and discussion of data from patients records. The records of sixteen (16) respondents were reviewed.

### Age distribution of patients with post caesarean section wound sepsis

It was necessary to obtain the age of the patients to determine whether there was any relationship between the age of the patient and wound sepsis. Data from patients records was as follows:

FIGURE 4.8: AGE DISTRIBUTION OF PATIENTS WITH POST CAESAREAN SECTION WOUND SEPSIS N = 16



#### KEY

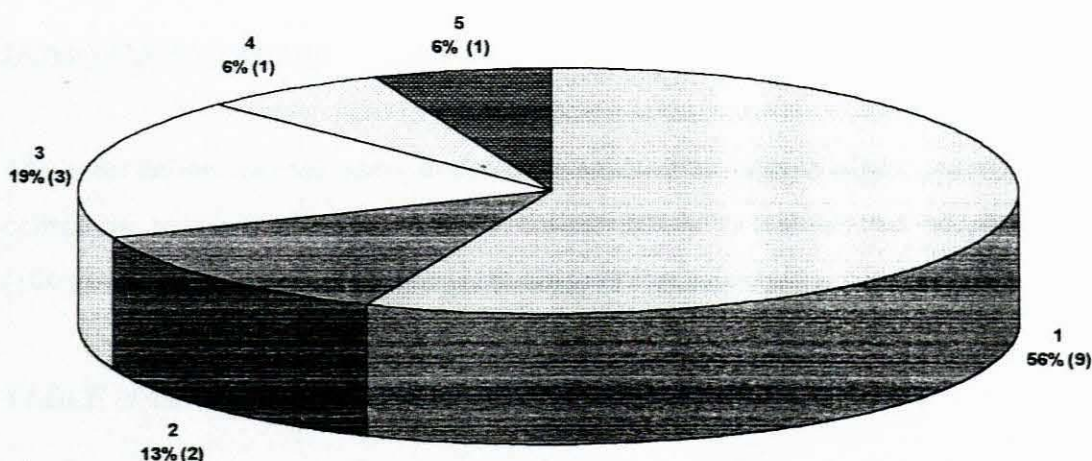
1	=	17-23
2	=	24-30
3	=	31-37
4	=	38-44

Figure 4.8 shows that 8 (50%) respondents who developed caesarean section wound sepsis were between 17-23 years of age. Though the results reveal that women between the age of 17-23 years developed post caesarean section wound sepsis. It may be concluded that age may not have predisposed to post caesarean section wound sepsis. The reason underlying this is the fact that half of the sample (50%) of respondents were between the age of 17-23 years. These findings are supported by Emmons, Krohn, Jackson & Eschenback (1988:560) and Green & Sarubbi (1977:687) who maintain that age of the patient does not contribute to post caesarean section wound sepsis.

### Period between admission and operation day

This item was of significance in obtaining preoperative period the patient spent in hospital as some patients may acquire infection during the preoperative period as revealed by Atkinson & Kohn (1978:76).

FIGURE 4.9: PERIOD BETWEEN ADMISSION AND OPERATION DAY



#### KEY

- |   |   |            |
|---|---|------------|
| 1 | = | 1-4 days   |
| 2 | = | 5-8 days   |
| 3 | = | 9-12 days  |
| 4 | = | 13-16 days |
| 5 | = | 17-20 days |

Figure 4.9 reflects that 9 (56%) respondents spent 1-4 days preoperatively while 3 (19%) respondents spent 9-12 days. Two (13%) respondents spent 5-8 days and one (6%) was hospitalised for 13-16 days and 17-20 days. According to the findings the preoperative period is not a risk factor to post caesarean section wound sepsis because even those patients who had a short period of stay of 1-4 days preoperatively



presented with post caesarean section wound sepsis. Findings are confirmed by Mishriki, Law & Jeffrey (1990:229) who pointed out that the preoperative period of the patient does not contribute to post caesarean section wound sepsis. Findings are contradicting Atkinson & Kohn (1978:76) who, though do not specify the number of days, clearly maintain that the preoperative period of a patient is a contributory factor to wound infection. One would therefore according to these findings conclude that the preoperative period is not a risk factor to post caesarean section wound sepsis. Probably the infection is a result of the individuals' low resistance to infection.

#### Duration of the operation

This information was necessary in detecting whether the length of the operation does contribute to post caesarean section wound sepsis as viewed by Magann *et al* (1993:922). Data recovered during reviewing of patients records is as follows:

TABLE 4.13: DURATION OF THE OPERATION N=16

DURATION	FREQUENCY	PERCENTAGE
40-60 minutes	9	56
61-120	4	25
121-180	3	19
TOTAL	16	100

Table 4.13 shows that 9 (56%) respondents were exposed to the caesarean section operation duration between 40-60 minutes, 4(25%) respondents were exposed to a duration between 61-120 minutes while 3 (19%) respondents were operated for a duration between 121-180 minutes. The results of the study reflect that though the duration of the operation was short (40-60 minutes) patients developed post caesarean section wound sepsis. Records further revealed that less number of patients became infected having been exposed to a longer duration of the operation (61-120 and 121-180). According to these findings there is no association between the duration of the

operation and post caesarean section wound sepsis. Findings are supported by Naumann *et al* (1995) who state that the length of the operation does not contribute to post caesarean section wound infection. Naumanns' statement is contrary to what is stated by Magann *et al* (1993:921) who maintain that the length of the caesarean section does lead to post caesarean section wound sepsis though not stated how wound infection is caused.

#### Presence of systemic diseases

On reviewing patients records the aim was to obtain presence of systemic wound infection as maintained by Rhodes *et al* (1978:66) and Thirsk (1995:2) who maintain that some systemic diseases expose surgical patients to wound infection. Records revealed the following.

TABLE 4.14: PRESENCE OF SYSTEMIC DISEASES N=16

SYSTEMIC DISEASES	FREQUENCY	PERCENTAGE
Diabetes	2	13
Hypertension	1	6
Sexually transmitted diseases	2	13
Pulmonary tuberculosis	2	13
None	9	56
TOTAL	16	100

Table 4.14 reveals that 9 (56%) respondents did not present with systemic diseases. These findings imply that systemic diseases appear not to contribute to post caesarean section wound sepsis. Seven (44%) respondents with post caesarean section wound sepsis presented with systemic diseases (hypertension 6%, sexually transmitted diseases 13%, diabetes 13% and pulmonary tuberculosis 13%). These results are supported by Magann *et al* (1984:924) who pointed out that patients with diabetes mellitus even if the percentage is small are susceptible to post caesarean section wound



sepsis, because of their low resistance and poor blood supply to body tissues. It is therefore clear that systemic diseases should be identified early and controlled.

#### Number of vaginal examinations

This information was recovered from patients records to obtain the number of vaginal examinations that were performed in each patient who developed post caesarean section wound sepsis, which could have contributed to post caesarean section wound sepsis as viewed by Moir-Bussy *et al* (1988:366). Data obtained is as follows:-

TABLE 4.15: NUMBER OF VAGINAL EXAMINATIONS N=16

NUMBER OF VAGINAL EXAMINATIONS	FREQUENCY	PERCENTAGE
1-5	7	44
6-10	9	56
TOTAL	16	100

Table 4.15 depicts that 9 (56%) respondents out of 16 were performed 6-10 vaginal examinations before caesarean section operation. This suggests that repeated vaginal examinations performed during labour prior to caesarean section are a risk factor to post caesarean section wound sepsis. Therefore vaginal examinations at the institution under study need to be monitored so that no patient is performed more than five vaginal examinations. The performance of vaginal examination should also be performed to those patients who are identified as requiring such an examination. The fact that patients should not have more than 5 vaginal examinations performed is supported by Hawrylyshyn, Bernstein & Papsin (1980) as supported by Moir-Bussy, Hutton & Thompson (1984); Emmons *et al* (1988); Roberts; Maccato; Faro & Pennel

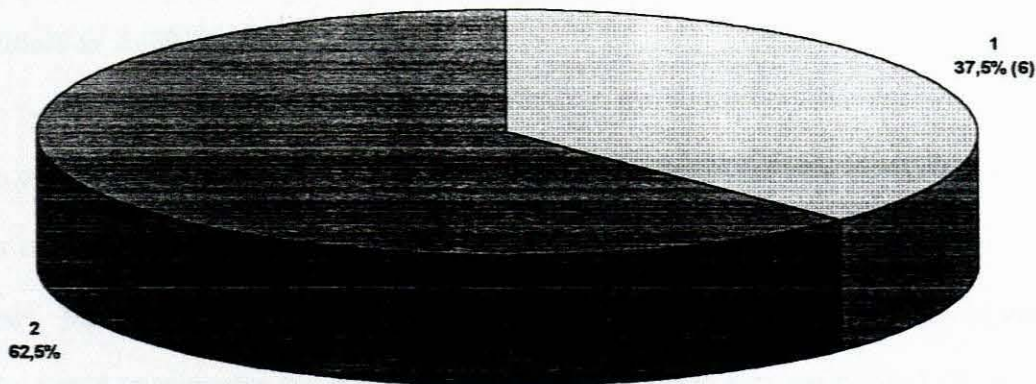


1993 and Magann **et al**, 1993, who maintain that the minimum number of vaginal examinations during labour should not be more than five (5).

#### Method of rupture of membranes

It was necessary to recover information on method of rupture of membranes so as to obtain the number of patients whose membranes ruptured spontaneously or artificially which could contribute to post caesarean section wound sepsis as indicated by Sellers (1993:1289).

FIGURE 4.10 METHOD OF RUPTURE OF MEMBRANES N=16



#### **KEY**

- 1 S ROM = spontaneous rupture of membranes
- 2 A ROM = artificial rupture of membranes

Figure 4.10 portrays that 10 (62,5%) respondents were performed artificial rupture of membranes. The results show that most patients who developed post caesarean section wound sepsis are those whose membranes were ruptured artificially. This suggests that artificial rupture of uterine membranes exposed patients to post

caesarean section wound sepsis. These findings are confirmed by the information obtained from 92%) of labour ward professional nurses who stated that they rupture membranes artificially by using amniotic hook if the patient is in labour. The findings suggest that artificial rupture of membranes is a risk factor. The policy of Hlabisa Hospital states that artificial rupture of membranes must be performed using a sterile amniotic hook but does not state whether it should be done on all patients or not. It is of great concern that the policy of the institution under study does not state that monitoring of rupture of membrane should be done as suggested by Sellers (1993:1291). Since artificial rupture of membranes appears to be a risk factor in this institution, the policy of rupturing membranes need to be reviewed for more clarity.

#### Duration of rupture of membranes

The period between rupture of membranes and the performance of a caesarean section was of importance as it may predispose the patient to post caesarean section wound sepsis. Martin & Reeder (1991:291) state that the period of membrane rupture needs to be noted to minimise the risk of uterine infection which exposes patients to wound infection if a caesarean section is performed. Data obtained from respondents records is as follows:

TABLE 4.16: DURATION OF RUPTURE OF MEMBRANES N=16

DURATION OF RUPTURE OF MEMBRANES	FREQUENCY	PERCENTAGE
1-12 hours	6	37,5
13-24 hours	8	50
25-36 hours	2	13
TOTAL	16	100



Table 4.16 reflects that 8 (50%) respondents out of 16 had a 13-24 hours duration of membrane rupture. The results showed that patients who have had ruptured membranes for more than 12 hours were at risk of developing post caesarean section wound sepsis. It is therefore necessary that duration of rupture of membranes be monitored for every patient who has had membrane rupture. It is also of significance that a high vaginal swab be taken in order to detect early intrauterine infection, and that prophylactic antibiotics be prescribed for patients with a long duration of membrane rupture (Sellers, 1993:1291). Unfortunately the policy of the institution does not emphasise the duration of ruptured membranes and also omit what is done for the patient whose membranes are ruptured for more than 12 hours of labour.

#### Urinary catheter and post caesarean section wound sepsis

Reviewing of patients records pertaining to removal of urinary catheter after caesarean section was of importance to detect whether a urinary catheter contributes to post caesarean section wound infection. Patients records revealed that 7 (44%) patients had their urinary catheter removed immediately after caesarean section in the operating room while 9 (56%) respondents had their urinary catheter removed after 24 hours. Results show that most patients (56%) who developed post caesarean section wound sepsis in the institution under study had their urinary catheter removed after 24 hours. This suggests that the patients were possibly exposed to infection, because according to Hillan (1995:1040) the urinary catheter must be removed within 24 hours and not later.

It is therefore necessary that nurses remove the urinary catheter within 24 hours. It is of great concern that in the institution under study the labour ward policy stated that the urinary catheter must be removed within 48 hours. Possibly that is why 9 (56%) patients had post caesarean section wound sepsis. The policy therefore needs to be reviewed on this aspect.

#### When the wound was opened

On obtaining the day of opening the patients wounds, records would reveal whether the patients' wounds were opened before 72 hours which would indicate whether the



wound of the patient was exposed to a possibility that lead to post caesarean section wound sepsis. Pearce (1996:2) maintain that aseptically incised wounds should not be opened within 48 hours, to reduce entry of micro-organisms that cause wound infection. Thirteen (81%) respondents had their wound opened in 72 hours post caesarean section while 3 (19%) respondents' wounds were opened in 24 hours. The results of the study imply no relationship between opening of the wounds and post caesarean section wound sepsis. Naumann *et al* (1995:414) pointed out that there are increased risks of wound infection in aseptically incised wounds if opened within 48 hours post operatively.

#### RESPONDENTS VIEWS ON HOW POST CAESAREAN SECTION WOUND SEPSIS AFFECTED THEM

It was important to request respondents to give their views on implications of post caesarean section wound sepsis as they have a true picture of it. The responses given by patients revealed that post caesarean section wound sepsis affected them physically, psychosocially and economically.

##### Physically

Eleven (69%) out of 16 respondents interviewed stated that post caesarean section wound sepsis causes an ugly abdominal scar. Seven (44%) teenage respondents out of eleven (69%) indicated that they were unhappy about the ugly scar because when they go to the beach they would be unable to hide it as they are fond of wearing bikini beach suits. These findings mean that teenage respondents have to change their pattern of life such as buying a full bathing costume instead of a bikini beach suit to hide an ugly scar. Findings are confirmed by Appleton & Leaper (1992:20) who maintain that one of the implications of post caesarean section wound sepsis is an ugly abdominal scar.

Thirteen (81%) respondents out of 16 respondents interviewed stated that they were performed various surgical procedures to facilitate healing of wounds. Findings show

that respondents were exposed to repeated operations which are stressful as they are accompanied by severe pain after each surgical procedure. During repeated surgical procedures respondents undergo debridement and secondary suturing under general anaesthesia for complete wound healing. Some of these patients refuse sometimes to be performed surgical procedures. This means that post caesarean section wound sepsis expose patients to multiple surgical procedures (Emmons *et al* 1988; Roberts *et al* 1993; Magann *et al* 1993 and Hillan, 1995).

### Psychosocially

Ten (63%) out of 16 respondents interviewed revealed that they were exposed to smelly wounds which lowered their self esteem. Respondents further stated that the smell from their wounds made them to be embarrassed to mix with family members including their husband, as the smell was unbearable. These findings show that respondents self esteem was affected. Findings are further supported by Appleton & Leaper (1992:26) who maintains that one of the implications of post caesarean section wound sepsis is a smelly wound.

Seven (44%) out of 16 respondents interviewed stated that they experienced poor quality of life as they were complaining of pain in the abdominal scar whenever it was cold. Respondents further stated that they will be unable to perform duties they used to undertake before the operation and wound infection, such as fetching water from the river and hoeing. Findings show that post caesarean section wound sepsis expose women to failure to perform their daily activities. Pearce (1996:2) maintains that patients with post caesarean section wound infection experience poor quality of life.

### Economically

The findings revealed that post caesarean section wound sepsis affect patients economically. Ten (63%) respondents indicated that they experienced prolonged hospitalisation. Six (38%) respondents out of 10 (63%) stated that they were



frustrated as a result of wound infection, as their children were being looked after by neighbours who will be paid for looking after their children, as they thought they would be discharged early. The financial strain is even worse to patients who are admitted in private institutions where fees are extremely high. Four (25%) respondents out of 10 (63%) stated that their children were being looked after by their husbands. This suggests that wound sepsis exposes the patients to unnecessary financial problems. Since the respondents pointed out that they experienced prolonged hospital stay the institution also may experience financial strain since additional health professionals are required for additional number of patients who are not discharged and increase the bed occupancy. For facilitating wound healing expensive wound cleansing solutions, wound drains, antibiotic creams and systemic antibiotics are prescribed for these patients. Findings are confirmed by Mishriki *et al* (1990:229) who maintain that in Canada wound infection lengthened the patients stay by 10,1 average days resulting in extra 2,000 (two thousand) dollars per patient.

## CONCLUSION

This chapter was concerned with data analysis, presentation, interpretation and discussion of findings.

Chapter five to follow will include overview of findings, conclusions, limitations and recommendations in relation to the incidence, risk factors and implications of post caesarean section wound sepsis to patients.



## **CHAPTER 5**

### **SUMMARY, LIMITATIONS, IMPLICATIONS OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **INTRODUCTION**

In this chapter a brief overview of the study will be presented with emphasis on selected major findings, conclusion, implications for patients and recommendations.

The purpose of this study was to investigate the incidence and risk factors of post caesarean section wound sepsis and its implications to patients. The objectives of the study were to:

- establish the incidence of post caesarean section wound sepsis at Hlabisa Hospital
- identify nursing staff, patient and environmental related factors that contribute to post caesarean section wound sepsis
- establish the implications of post caesarean section wound sepsis for patient.

Report on findings based on the data collected indicated the following:

#### **OBJECTIVE 1: THE INCIDENCE OF POST CAESAREAN SECTION WOUND SEPSIS AT HLABISA HOSPITAL**

The study revealed that out of eight hundred and fifteen (815) patients who underwent caesarean section between July 1995 to July 1996, 16 (2%) developed post caesarean section wound sepsis. This depicts that there is no increase in the incidence when

comparing the statistics for January 1994 to June 1995 which was also 2%. Baker (1990:43) maintain that the incidence of 2% is acceptable. In the opinion of the researcher, stasis of the incidence indicates that there are some factors that need to be identified and controlled so that the incidence is decreased to less than 2%.

**OBJECTIVE 2: PERSONNEL, PATIENT AND ENVIRONMENTAL  
RELATED FACTORS OF POST CAESAREAN SECTION  
WOUND SEPSIS**

Personnel related factors of post caesarean section wound sepsis

The study sought to determine personnel related factors that expose patients to post caesarean section wound sepsis. Generally few personnel related factors were identified and are as follows:

Method of rupturing membranes in a patient in labour

Professional nurses performed artificial rupture of membranes to 10 (62,5%) out of 16 patients who developed post caesarean section wound sepsis. Artificial rupture of membranes was identified as a risk factor that predispose women to post caesarean section wound sepsis. Performing artificial rupture of membranes exposes patients to entry of micro-organisms through the vaginal canal during labour. It is of great concern that most of professional nurses still perform artificial rupture of membranes to patients who are in labour. This indicates that professional nurses contribute to intrauterine infection since early rupture of membranes predispose patients to infections. According to Sellers (1993:402) patients with artificial rupture of membranes must be monitored to detect intrauterine infection. This is inadequately done in this institution. Probably this may be attributed to the fact that the policy of the institution under study does not state monitoring of patients with ruptured membranes.

### Number of vaginal examinations

Findings showed that repeated vaginal examination is performed to patients in this institution. This was confirmed by the patients records which revealed that 9 (56%) out of 16 patients had 6-10 vaginal examinations performed by professional nurses in labour ward, which exposes patients to post caesarean section wound sepsis. It is of great concern that the policy of the institution does not emphasise the number of vaginal examinations that are to be performed during labour. According to Hawrylyshyn, Bernstein & Papsin, 1980 as supported by Moir-Bussy, Hutton & Thompson 1984; Emmons *et al*, 1988; Roberts *et al*, 1993 and Magann *et al*, 1993 the minimum number of vaginal examinations must not be more than 5.

### Using general purpose gloves for sneak vaginal examination

Findings show that 2 (15%) professional nurses out of 13 stated that general purpose gloves were used for sneak vaginal examination. Sneak vaginal examinations expose patients to entry of micro-organisms through the vaginal canal because they are never recorded. Patients performed sneak vaginal examinations are therefore exposed to post caesarean section wound sepsis. Despite the small number of professional nurses (2(15%)) who perform sneak vaginal examination those women who are exposed to sneak vaginal examination will be at risk of developing wound infection after they have had caesarean section since the sneak vaginal examination are never recorded.

### Qualifications of operating theatre professional nurses

Findings reveal that there was no professional nurse with diploma in operating theatre nursing science as an additional qualification. This is of great concern since such a professional nurse would render adequate orientation in operating theatre practice with regard to prevention of post caesarean section wound sepsis.



## ENVIRONMENTAL RELATED FACTORS OF POST CAESAREAN SECTION WOUND SEPSIS

The study was also aimed at identifying environmental related factors of post caesarean section wound sepsis. Scanty environmental factors were identified such as:

### Regular cleaning of the floor in labour ward

Only 2 (15%) professional nurses out of 13 emphasised regular cleaning of the floor as an important principle of environmental control. This means that 11 (85%) professional nurses out of 13 are not aware that cleaning of the floor is an important principle of environmental control. This is of great concern since professional nurses are to supervise and encourage ward aides to clean the floor regularly. Failure to clean the floor regularly in labour ward is viewed as a risk factor for post caesarean section wound sepsis in this study.. Though according to Ziady, Small & Louis (1997:40) cleaning of the floor does not remove all microbes it could minimise the number of microbes and possibly reduce post caesarean section wound sepsis.

## PATIENT RELATED FACTORS OF POST CAESAREAN SECTION WOUND SEPSIS

The following patient related factors were identified during the study:

### Low Socio economic status of patients and their spouses

The study revealed the socio economic status of patients as a risk factor to post caesarean section wound sepsis. This is confirmed by the fact that 11 (85%) out of 16 patients were unemployed and 10 (63%) patients spouses were also unemployed. This suggests that most women who underwent caesarean section were having a low resistance due to malnutrition. This is supported by Magann *et al* (1993:925) who emphasise that pregnant women of a low socio economic status are exposed to post

caesarean section wound sepsis if a caesarean section is performed. This factor reveals a need for emphasising the importance of family planning for such a group of women.

#### Distance of the patient to the nearest clinic or hospital

The findings revealed that 7 (44%) patients out of 16 travelled a distance between 10-12 kilometres to reach the nearest clinic or hospital. Since Hlabisa Hospital is in a rural area, a distance of 10-12 kilometres may negatively influence patients from attending antenatal clinic and seeking medical advice promptly when they are in labour. This suggests that the distance of the patient from the nearest clinic is a risk factor because inaccessibility of the clinic in patients probably with cephalopelvic disproportion or malpresentation, may expose patients to entry of micro-organisms vaginally, due to an unclean home environment and attendance by inexperienced attendants during labour.

#### Duration of rupture of membranes

Findings show that 8 (50%) patients had a duration of ruptured membranes which ranged between 13-24 hours. This suggests that these patients were exposed to entry of micro organisms through the vaginal canal which resulted to post caesarean section wound sepsis.

#### Wound care guidance

The study showed that 13 (81%) patients out of 16 interviewed were given guidance on wound care. Though the interviewed patients were given guidance on wound care, some aspects such as adequate nutrition were omitted by professional nurses. This is of great concern since adequate nutrition facilitates rapid wound healing during the post caesarean section period.

### Indications for caesarean section

Findings indicated that out of 16 patients 8 (50%) were performed caesarean section due to cephalopelvic disproportion. In cephalopelvic disproportion labour is prolonged and frequent vaginal examinations are likely to be performed. This exposes patients to entry of micro organisms through the vaginal canal. Nielsen & Hokegard (1982) indicate that during cephalopelvic disproportion, the presenting part remains at or below the ischial spines for sometime; thus exposing patients to wound infection if a caesarean section is performed.

### Urinary catheter and post caesarean section wound sepsis

The study revealed that 9 (56%) patients who developed post caesarean section wound sepsis in the institution under study had their urinary catheter removed after 24 hours. It is of great concern that the policy of the institution under study state that the urinary catheter must be removed within 48 hours whilst authors like Hillan (1995) emphasise that the urinary catheter must be removed within 24 hours.

**OBJECTIVE 3: IMPLICATIONS OF POST CAESAREAN SECTION WOUND SEPSIS FOR PATIENTS**

The implications of post caesarean section wound sepsis for patients was also investigated. On interview patients showed that they are affected differently by various factors when they are hospitalised for longer periods while healing of post caesarean section wound sepsis is being treated. The following responses were obtained:

### Repeated surgical operations

Thirteen (81%) patients out of 16 stated that they experienced stress when they had to undergo repeated operations which involved repeated general anaesthesia.



### Ugly abdominal scar

Eleven (69%) out of 16 patients verbalised that they became worried if the abdominal scar became septic as it was ugly.

### Smelly wound

The study revealed that 10 (63%) out of 16 patients stated that they became miserable when experiencing smelly wound and further stated that it was worse when they were to be treated at their homes since they became embarrassed when they were with their relatives.

### Poor quality of life

Seven (44%) patients out of 16 stated that wound sepsis affected their life since they became weak and unable to perform their duties.

### Extended hospital stay

Most patients with post caesarean section wound sepsis (10 (63%) out of 16) complained about wound sepsis exposing them to prolonged hospital stay. They verbalised that this affected them financially since the hospital bill rises up when they are in the hospital. They further verbalised that prolonged hospital stay become unbearable when they are separated from their family especially young children as they have to hire people to look after them.

## **LIMITATIONS**

The study was only conducted at Hlabisa Hospital. The sample included the professional nurses working in labour ward and operating theatre as well as few

patients who were incidentally sampled as they developed post caesarean section wound sepsis. The findings of the study therefore cannot be generalised.

## CONCLUSION

Conclusion drawn from the study revealed the following:

### Incidence of post caesarean section wound sepsis

Incidence of post caesarean section wound sepsis remains unchanged at Hlabisa Hospital.

### Personnel related factors

Less personnel related factors were identified as contributing to post caesarean section wound sepsis and these are:-

- Artificial rupture of membranes in women in labour.
- Number of vaginal examinations performed.
- Failure to give patients health education on wound care.
- Failure to remove urinary catheter within 24 hours.

### Environmental related factors

The study also revealed few environmental factors such as:

Failure to clean the floor regularly.

### Patient related factors

The study revealed less patient related factors that are predisposing patients to post caesarean section wound sepsis and are tabulated as follows:

- Socio economic status of patients and their spouses.
- Distance of the patient to the nearest clinic or hospital.
- Duration of rupture of membranes.
- Indications for caesarean section such as cephalopelvic disproportion, previous caesarean section and malpresentation.

#### Implications of post caesarean section wound sepsis for patients

The study revealed that post caesarean section wound sepsis affects patients physically, psychosocially and economically as they revealed the following:

- Repeated surgical operations.
- Ugly abdominal scar.
- Smelly wound.
- Poor quality of life.
- Extended hospital stay.

#### **RECOMMENDATIONS**

The policy of the institution must be reviewed in regarding:-

##### Number of vaginal examination in patients in labour

The institutions policy must be reviewed in respect of the number of vaginal examinations that are performed on the patient in labour, to prevent post caesarean section wound infection.



### Monitoring of patients in established labour with ruptured membranes

All patients with ruptured membranes, especially those with artificial rupture must be monitored for early detection of intra uterine infection that could expose patients to post caesarean section wound sepsis.

### Principles of environmental control in relation to the floor

Professional nurses must be given regular inservice education on the principles of environmental control with regard to prevention of post caesarean section wound sepsis.

### Health education

Health education on the importance of follow up care and attending of antenatal care to all patients with diseases such as diabetes, pulmonary tuberculosis and sexually transmitted diseases need to be emphasised.

### Post operative care of caesarean section patients

The policy of the institution must be reviewed in terms of removal of the urinary catheter post operatively. It is recommended that the urinary catheter be removed within 24 hours to reduce risk of post caesarean section wound infection.

### Wound care guidance

Professional nurses must emphasise adequate nutrition to post caesarean section patients to facilitate rapid wound healing in addition to personal hygiene measures.

### Qualifications of operating theatre professional nurses

The authorities in charge of the hospital should identify professional nurses who are interested in undertaking a course in diploma in operating theatre nursing science so that this unit has one or more professional nurses with this qualification.

### Medical surgical clinical nurse specialist post

Motivation to the department of health for the above mentioned post must be undertaken to ensure specialisation in this field and reduce the incidence of post caesarean section wound sepsis to less than 2%.

Further research on a larger scale must be undertaken since post caesarean section wound sepsis is not without negative implications to the patients.

### SUMMARY

From the responses of labour ward and operating theatre professional nurses, patients interviews as well as data from patients records it appears that there is no increase in post caesarean section wound sepsis. The response reveals that there are few personnel, environmental and patient related factors contributing to post caesarean section wound sepsis. It is also evident from the study that patients with post caesarean section wound sepsis experience physical, psychosocial and economical problems.

All the objectives were achieved by the study.

## BIBLIOGRAPHY

1. ADAMS, A. 1990. Theatre Nursing. Oxford:Heinenmann Professionals Publishing Ltd.
2. ATKINSON, L.J. & KOHN, L.M. 1978. Berry & Kohn's Introduction to Operating Room Technique. St. Louis:McGrawhill Book Company.
3. ATKINSON, L.J. & FORTUNATO, N. 1997. Berry & Kohn's Operating Room Technique. St. Louis: C.V. Mosby.
4. BABBIE, E. 1990. Survey Research Methods. California:Wadsworth.
5. BELAND, T.L. 1970. Clinical Nursing. 2nd Edition. London:The MacMillan Company.
6. 610.736.78 BOB, I.M.; LOWDERMILK, D.L.; JENSEN, M.D. & PERRY, S. 1995. Maternity Nursing. St. Louis:C.V. Mosby.
7. BRUNNER, L.S. & SUDDARTH, D.S. 1990. Medical Surgical Nursing. London:J.B. Lippincott Company.
8. DUBBAY, E.C. & CRUBB, R.D. 1978. Infection Prevention and Control. 2nd Edition London:C.V. Mosby.
9. ELLIS, J.R. & NOWLISS, E.A. 1985. Nursing:A Human Needs Approach. :U.S.A.:Houghton Mufflin Company
10. HULL, E.J. & ISAACS, B.J. 1986. Wound Infection. Eastbourne:Swiss Saunders & Company.
11. JENSEN, M.D. ; BENSEN, R.L. & BOBAK. 1977. Maternity Care. The Nurse and the Family. St. Louis:C.V. Mosby Company.
12. LAST, J.M. 1995. A Dictionary of Epidemiology. New York:Oxford University.



13. LOWBURY, E.J.L. 1975. Control of Hospital Infection. 1st Edition. London:Chapman and Hall.
14. LUCKMAN, J. & SORENSON, K.C. 1980. Medical and Surgical Nursing. A Psychophysiologic Approach. Philadelphia:W.B. Saunders.
15. MARTIN, L.L. & REEDER, S.J. 1991. Essentials of Maternity Nursing. Philadelphia:J.B. Lippincott Company.
16. MEAKINS, J.L. 1994. Surgical Infection. Cape Town: Juta & Company
17. MELLISH, J.M. 1994. An Introduction to Ethos of Nursing. A text for basic student nurses. Durban:Butterworth Publishers (Pty) Ltd.
18. MENARD, S.W. 1987. The Clinical Nurse Specialist Perspective on Practice. New York:Wiley Medical Publications.
19. NIGHTINGALE, K. 1987. Learning to Care in Theatre. London:Hodder and Houghton.
20. POLIT, D.F.; HUNGLAR, B.P. 1987. Nursing Research Principles and Methods. Third Edition Philadelphia:Lippincott.
21. RHODES, M.T.; GRUENDEMANN, B.J. & BALLINGER, W.F. 1978. Alexander's Care of the Patient in Surgery. St. Louis:C.V. Mosby Company.
22. SEARLE, C. 1986. Professional Practice:A South African Nursing Perspective. Durban:Butterworth.
23. SELLERS, P.M. 1993. Midwifery:A Textbook and Reference Book for Midwives in Southern Africa.Cape Town:Juta & Company. Ltd.
24. TREECE, R.D. & TREECE, J.W. 1986. Elements of Research in Nursing. Third Edition. St. Louis:Mosby.
25. VLOK, M.E. 1983. Manual of Basic Nursing. Cape Town:Juta & Company.

26. VLOK, M.E. 1993. Manual of Basic Nursing. Cape Town:Juta & Company,

## **JOURNALS**

1. AMIRIKIA, H.; ZARENWYCH & EVANS, T.N. 1981. Caesarean Section. 15 Year Review of Changing Incidence, Indications and Risks. American Journal of Obstetrics and Gynaecology 140, 81-86.
2. APPLETON, G.V.N. & LEAPER, D.J. 1992. Failed Antibiotic Prophylaxis in Elective Surgery. Hospital Update George Warman Publications (Pty) Ltd:Cape Town Vol 3, No. 1:19-29.
3. BABB, J.R. 1996. Application of Disinfectants in Hospitals and Other Health Care Establishment. Infection Control Journal of South Africa Vol 1 No. 1:4-11.
4. BAKER, L.W. 1990. Wound Infection and Quality Control. Durban:University of Natal, p.43-44.
5. BROWN, W & JAROS, G. 1990. Clinical Nursing. Nursing R.S.A. Vol 5 No 1 19-23.
6. CHIA, J.Y.; TALI, K.W. & JAY, L. 1993. A survey of Post Operative Wound Infection, in Obstetrics and Gynaecology. Singapore Medical Journal Vol 34 No. 3 221-224.
7. EMMONS, S.L.; KROHN, M.; JACKSON, M. & ESCHENBACH, D.A. 1988. Wound Infection after Caesarean Section. American Journal of Obstetrics & Gynaecology, Vol 72, No 4, 559-564.
8. FARREL, S.J.; ANDERSON, H.F. & WORK, B.A. 1980. Caesarean Section:Indications and Postoperative Morbidity. Obstetrics and Gynaecology, Vol 56, No. 2, 696-700.
9. GREEN, S.L. & SARUBBI, F.A. 1977. Risk Factors Associated with Post Caesarean Section Febrile Morbidity. Obstetrics and Gynaecology, Vol. 49, No. 6, 686-690.

10. GREGORY, E. 1990. Use of Gloves. Nursing R.S.A., Vol 5, No 11/12, 41-42.
11. HAWRYLSHYN, P.A.; BERNSTEIN, P. & PAPSIN, F.R. 1981. Risks of Infection After Caesarean Section. Mosby Canada: Obstetrics & Gynaecology, Vol 139, No. 3, 294-297.
12. HELLMAN, C. 1994. The Making of Clinical Specialist. Nursing Outlook, 22 (3) 165-167. George Warman Publication (Pty) Ltd, Cape Town.
13. HILLAN, E.M. 1995. Post Operative Morbidity Following Caesarean Section. Journal of Advanced Nursing, Vol 22, 1035-1042.
14. KRAENZLE, J. 1992. Role definition as discharge co-ordinator. Clinical Nurse Specialist, Vol 6, No 1, 36-39.
15. MAGANN, E.F.; DODSON, M.K.; RAY, M.A.; HARRIS, R.L.; MARTIN, J.N. & MORRISON, J.C. 1993. Preoperative Skin Preparation and Intraoperative Pelvic Irrigation. Impact on Postcaesarean Endometritis and Wound Infection. Obstetrics & Gynaecology, Vol 81, No. 6.
16. MISHRIKI, S.F.; LAW, D.J. & JEFFREY, P.J. 1990. Factors Affecting the Incidence in Postoperative Wound Infection. Journal of Hospital Infection, Vol 16, 228-230.
17. MOIR-BUSSY, B.R.; HUTTON, M.R. & THOMPSON, J.R. 1984. Wound Infection after Caesarean Section. Journal of Hospital Infection, Vol 5, 359-370.
18. NAUMANN, R.W.; HAUTH, J.C.; HODGKINS, P.M.; LINCOLN, T. 1995. Subcutaneous Tissue Approximation in Relation to Wound Eruption after Caesarean Delivery in Obese Women. Obstetrics & Gynaecology, Vol 85, No. 3, 412-416.
19. NIELSEN, T.J. & HOKEGARD, K.H. 1982. Postoperative Caesarean Section Morbidity. A Prospective Study. American Journal of Obstetrics and Gynaecology, Vol 1, 46, 911-914.



20. PEARCE, J. 1996. Wound Care: Prevention of Infection and Cross Infection. The Nightingale, Vol 6, No. 2, 1-3.
21. ROBERTS, S.; MACCATO, M.; FARO, S. & PINNEL, P. 1993. The Microbiology of Postcaesarean Wound Morbidity. American Journal Obstetrics & Gynaecology, Vol 81, No. 3 383-386.
22. SMOLENIEC, J. & JAMES. 1993. Identification and management of the at risk patient. Hospital Update, Vol 4, No 1, 14-21. George Warman Publication (Pty) Ltd: Cape Town.

## REPORTS

1. BARNADO, L. 1994. The Role of an Infection Control Nurse. Durban: Addington Hospital Unpublished.
2. BUTHELEZI, E. 1989. The Clinical Nurse Specialist. Department of Health- KwaZulu-Ulundi. Unpublished.
3. CRUISE, P.J.E. 1993. The Use of Skin Disinfectants (Antiseptics) Preoperatively. University of Cape Town - Department of Microbiology.
4. HLABISA HOSPITAL POLICY 1992. Labour Ward and Operating Theatre Prevention of Wound Infection. Unpublished.
5. KELSO, H. 1990. Aspects of Nursing Care of Surgical Patients. Infection Control. Speakers paper of Third International Conference. The next ten years. Durban: University of Natal.
6. KWAZULU-NATAL Provincial Administration of Health. Guidelines for the Management of Infection. Infection Control 1996.
7. LARSEN, J.V. 1995. Obstetrics Manual for District Hospitals in South Africa. Unpublished.

8. LARSEN, J.V. 1995. Maternity Unit Standing Orders and Management Protocols. Hlabisa Hospital. Unpublished.
9. LOMBARD, C.J. 1994. Determinants of Caesarean Section Wound Sepsis. Livingstone Hospital Port Elizabeth. Unpublished.
10. SOUTH AFRICAN NURSING COUNCIL ACT (50 OF 1978) Government Gazette as amended.
11. UYS, E. 1990. The Cause of Infection and the Healing Process. Speakers Paper of Third International Conference. Durban - University of Natal.

## ANNEXURE "A"

Box 25  
HLABISA  
3937

The Medical Superintendent  
Hlabisa Hospital  
HLABISA  
3937

Dear Sir/Madam

### **REQUEST TO UNDERTAKE RESEARCH**

I am writing this letter to ask for permission to undertake research in your institution. The study is an investigation of the incidence and the risk factors of post caesarean section wound sepsis in patients at Hlabisa Hospital and the implications to patients.

The study is the requirement for Research in Masters degree at the University of Zululand under supervision of Professor T.G. Mashaba and Mrs B.M. Zungu.

The proposal can be furnished if needed.

Your co-operation will be highly appreciated.

Yours faithfully

ABIGAIL N. KHATHI (Mrs)



KWAZULU DEPARTMENT OF HEALTHRECOMMENDATION AND APPROVAL FOR CARRYING OUT RESEARCH

## 1. Personal Details and Researcher

Name: ABIGAIL N. KHATHI Official Title: MrsAddress: P.O. Box 25 HLABISAEmployer: Department of HEALTH HLABISA HOSPITAL2. Research Title: INVESTIGATION OF INCIDENCE ANDRISK FACTORS OF POST CAESAREAN SECTION WOUND SEPSIS IN HLABISA HOSPITAL AND THE IMPLICATIONS TO PATIENTS.3. Recommendations by ~~Institution/Regional Officer~~ /Study Leader ✓Strongly recommend.B. M. Zungu29/07/95

## 4. Chairmam of Research Committee:

Remarks: .....

Confirm that the project has been approved by the  
research Committee

SIGNED: ..... DATE: .....

## 5. Superintendent or Regional Officer

Remarks: .....

1. Confirm that use of facilities will not, in my opinion, disrupt the routine of the institution.

SIGNED: .....<sup>24</sup> DATE: .....

6. Head of professional group of researcher:

Remarks:.....  
.....

SIGNED:..... DATE:.....

7. Head of Pharmaceutical Services. (In the case of clinical trials)

Remarks:.....  
.....

SIGNED:..... DATE:.....

8. HEAD OF DEPARTMENT

THIS PROJECT IS APPROVED / ~~NOT APPROVED~~

Remarks:

Conditions:.....  
.....  
.....  
.....  
.....  
.....  
.....

*AET Gure*

*h*

SECRETARY FOR HEALTH

DATE:

*9.10.95.*

## ANNEXURE "C"

### **QUESTIONNAIRE ON INVESTIGATION OF INCIDENCE AND RISK FACTORS OF POST CAESAREAN SECTION WOUND SEPSIS IN HLABISA HOSPITAL AND THE IMPLICATIONS TO PATIENTS**

#### **QUESTIONNAIRE SUBMITTED TO LABOUR WARD PROFESSIONAL NURSES**

This questionnaire is not a test but it is for research purposes only. There is no right or wrong answer. No names will be used to ensure anonymity. Your participation is very important to the accuracy of this research.

Respond by making a cross (X) in the applicable box or provide the required information.

#### **SECTION A: ASPECTS ON PERSONAL DATA**

1. State your qualifications: -----

2. State your status/job title

Professional Nurse / /

3. State duration of service/working capacity

1-2 years and under

3-5 years

6-8 years

9 years and over




## SECTION B: ASPECTS ON LABOUR WARD PRACTICE

1. What are the principles of vaginal examination for a patient in established labour in this labour ward?

Using general purpose gloves for sneak vaginal examination

Using a sterile vaginal pack for each examination

2 hourly vaginal examination


2. Name the method used for confirmation of diagnosis of pre-labour rupture of membranes in this labour ward.

Sterile gloved hand

Sterile vaginal speculum

Any other


3. Name the method used for (artificial) rupture of membranes in a patient in labour at this hospital.

---

---

## SECTION C: ASPECTS ON POST CAESAREAN SECTION WARD PRACTICE

1. List principles of wound dressing according to the policy of this hospital.

---

---

---

---

---

2. List principles of ward environmental control in this hospital according to the following:

(a) The floor

---

---

(b) Dusting

---

---

(c) Dusting cloths

---

---

## ANNEXURE "D"

### **QUESTIONNAIRE ON INVESTIGATION OF INCIDENCE OF RISK FACTORS OF POST CAESAREAN SECTION WOUND SEPSIS IN HLABISA HOSPITAL AND THE IMPLICATIONS TO PATIENTS**

#### **QUESTIONNAIRE SUBMITTED TO OPERATING THEATRE PROFESSIONAL NURSES**

This questionnaire is not a test but it is for research purposes only. There is no right or wrong answer. No names will be used to ensure anonymity. Your participation is very important to the accuracy of this research.

Respond by making a cross (X) in the applicable box or provide the required information.

#### **SECTION A: ASPECTS ON PERSONAL DATA**

1. State your qualifications: -----
2. State your status/Job title: -----

Professional Nurse    /        /

3. State duration of service/working capacity

1-2 years and under

3-5 years

6-8 years

9 years and over




## SECTION B: ASPECTS ON OPERATING THEATRE PRACTICE

1. Which item of attire do you wear first when wearing theatre garb on entering theatre.

- 1.1 Theatre dress/trouser or shirt
- 1.2 Theatre cap
- 1.3 Overshoes/boots/clogs
- 1.4 Theatre face mask


2. Give reasons for your response

.....

.....

3. What should be borne in mind when doing effective surgical handwashing procedure?

-----

-----

-----

-----

-----

4. Give reasons for your response

-----

-----

-----

5. The commonly practised skin preparation of a patient for a proposed caesarean section in this hospital involves cleaning from:

- 5.1 Xiphisternum to the pubis
- 5.2 Xiphisternum to the flanks
- 5.3 Xiphisternum to the midthighs
- 5.4 The umbilicus to midthighs


## ANNEXURE "E"

### **STRUCTURED INTERVIEW GUIDE TO HEALTH CONSUMER FOR INVESTIGATION OF INCIDENCE AND RISK FACTORS OF POST CAESAREAN SECTION WOUND SEPSIS IN HLABISA HOSPITAL AND IMPLICATION TO PATIENTS**

THE RESEARCHER WILL INTERVIEW PATIENTS GOING BY THE FOLLOWING GUIDE. SOME OF THE FOLLOWING INFORMATION WILL BE EXTRACTED FROM PATIENT'S RECORDS

1. Patient registered number
2. Date of admission
3. Date of operation
4. Age of patient
5. Socio-economic status of patient


Employed

---

---

Not employed

---

---

6. Socio economic status of patients spouses

Employed -----

---

Not employed -----

---



7. Access to health care

Proximity to nearest clinic or hospital

---

---

8. Indication of caesarean section

- 8.1 Cephalo pelvic disproportion
- 8.2 Meconium stained liquor grade I I
- 8.3 Meconium stained liquor grade I I I
- 8.4 Poor progress
- 8.5 Foetal distress
- 8.6 Cord prolapse
- 8.7 Ante partum haemorrhage
- 8.8 Breech presentation
- 8.9 Pregnancy induced hypertension
- 8.10 Previous caesarean section
- 8.11 Prolonged rupture of membranes
- 8.12 Any other


8.9 How many caesarean sections have you had previously?    /    /

10. Presence of systemic diseases

---

---

11. What instructions or guidance was given on discharge?

---

---

12. How did/has the caesarean section wound sepsis affected you?

(a) Bodily/Physically

---

---

(b) Psycho-socially

---

---

(c) Economically

---

---

ANNEXURE "F"

**CHECKLIST ON RECORDS OF PATIENTS WHO DEVELOPED  
POST CAESAREAN SECTION WOUND SEPSIS**

**SECTION A: ASPECTS ON PATIENT'S PARTICULARS**

- |    |                               |   |  |
|----|-------------------------------|---|--|
| 1. | Patient's registered number   | <table border="1"><tr><td> </td></tr></table> |  |
|    |                               |   |  |
| 2. | Age of the patient            | <table border="1"><tr><td> </td></tr></table> |  |
|    |                               |   |  |
| 3. | Date of admission             | <table border="1"><tr><td> </td></tr></table> |  |
|    |                               |   |  |
| 4. | Date of operation             | <table border="1"><tr><td> </td></tr></table> |  |
|    |                               |   |  |
| 5. | Time of operation             | <table border="1"><tr><td> </td></tr></table> |  |
|    |                               |   |  |
| 6. | Presence of systemic diseases | <table border="1"><tr><td> </td></tr></table> |  |
|    |                               |   |  |

**SECTION B: ASPECTS ON PRE-OPERATIVE VARIABLES**

- |    |   |   |  |  |  |  |  |
|----|---|---|--|--|--|--|--|
| 1. | Number of vaginal examinations                        | <table border="1"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table> |  |  |  |  |  |
|    |   |   |  |  |  |  |  |
|    |   |   |  |  |  |  |  |
|    |   |   |  |  |  |  |  |
|    |   |   |  |  |  |  |  |
|    |   |   |  |  |  |  |  |
| 2. | How membranes were ruptured?                          |   |  |  |  |  |  |
| 3. | When?   |   |  |  |  |  |  |
| 4. | Time lapse between rupture of membranes and operation |   |  |  |  |  |  |
| 5. | Duration of rupture of membranes                      |   |  |  |  |  |  |

**SECTION C: ASPECTS ON POST OPERATIVE VARIABLES**

- |    |                          |
|----|--------------------------|
| 1. | Urinary catheter removal |
| 2. | When was wound opened?   |
|    | -----                    |
|    | -----                    |
|    | -----                    |