INFORMATION PRACTICES IN MIDWIFERY: A CASE STUDY OF AN ANTENATAL AND INTRAPARTUM CARE ENVIRONMENT IN THE WESTERN CAPE, SOUTH AFRICA

by

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DECLARATION

I, Alrasheed Mustafa, declare that the contents of this dissertation represent my own unaided work, and that the dissertation/ thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

Research on health informatics has seen a steady increase during this decade as the role of information technology in the health sector becomes pertinent. Findings of previous research in this domain have uncovered vast information needs of health workers, particularly in developing countries. However, there is a need to continue with multidisciplinary research in priority areas such as midwifery practice and in the environment of marginalised settings. This study explores the significance of the information needs and information-seeking behaviour or practice of midwives during the antenatal and intrapartum care within the environment of a midwifery unit. Additionally, the researcher obtained permission from Faculty of Informatics and Design – CPUT and Health department authority – Western Cape Government in South Africa, to conduct research in the Elsies River Midwifery Obstetric Unit (ERMOU). The research was carried out as case study in a Midwifery Obstetric Unit in the Western Cape, South Africa. The investigator conducted semi-structured interviews and observations to collect qualitative data of the antenatal and intrapartum care environment. The data was transcribed and analysed using thematic analysis and essomenic modelling.

The findings comprehensively point to the importance of this research context. The study found that midwives acquired patients' information from a handwritten Maternity Case Record (MCR) book and midwives' colleagues, and often during handovers. In addition, midwives also communicate with each other during care activities in the ERMOU. It was apparent that the use of such communication practices is inadequate, and midwives did not always have sufficient information to make appropriate decisions in the ERMOU. All patient information, referral notes, and reporting is paper-based.

In addition, essomenic models were used to depict the midwives' work activities in the antenatal and intrapartum care environment in the Unit. Furthermore, essomenic models defined all the systematic processes that occur in the ERMOU which is described by midwives' activities and work environment. To improve communication, future research is recommended to consider the importance of the continuity of the education of midwives. Further research will be on the implementation of nursing informatics and the electronic health record system in the Elsies River Midwifery Obstetric Unit.

Keywords: Information needs, information-seeking practice, midwives, communication needs, health informatics, intrapartum care

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ABBREVIATIONS

ACM	Australian College of Midwives
AM	Antenatal Meeting
AMIA	American Medical Informatics Association
BP	Blood Pressure
CHC	Community Health Centre
CIS	Collaborative Information Seeking
CPGs	Clinical Practice Guidelines
CPUT	Cape Peninsula University of Technology
CSCIS	Computer Supported Collaboration Information Seeking
CSCW	Computer-Supported Cooperative Work
DENOSA	Democratic Nursing Organization of South Africa
DOH	Department Of Health
E-Health	Electronic Health
ELIS	Everyday Life Information Seeking
ERMOU	Elsies River Midwife Obstetric Unit
EM	Essomenic Model
EMRs	Electronic Medical Records
ESRC	Economic and Social Research Council
HCI	Human Computer Interaction
HI	Health Informatics
HIM	Health Information Management
HIT	Health Information Technology
ICM	International Confederation of Midwives
ICN	International Council of Nurses
ICT	Information and Communication Technology
ISCM	Information Seeking and Communication Model
KEMH	King Edward Memorial Hospital
MCR	Maternity Case Record
MI	Medical Informatics
MIBCM	Midwives Information Behaviour and Communication Model
MOU	Midwifery Obstetric Unit
NBSA	Nurses Board of South Australia
NCCEMD	National Committee on Confidential Enquiry into Maternal Deaths
NHS	National Health Service

NICE	National Institute for Health and Care Excellence
NMC	Nursing & Midwifery Council
NUSA	Nursing Update South Africa
PPE	Positive Practice Environments
RSA	Republic of South Africa
SA	South Africa
SANC	South African Nursing Council
SP	Services Programme
WCG	Western Cape Government
WHO	World Health Organization

GLOSSARY OF TERMINOLOGY

Table 1: Glossary

Active phase	"There are regular painful contractions; and there is progressive cervical dilatation from 4cm" (White et al., 2012:2).
BANC Clinic	A Basic Antenatal Clinic (BANC) is a smaller facility that manages pregnant women in the initial stage of pregnancy. Usually, midwives receive patients from the BANC clinic into the MOU for management from 36 weeks to postnatal period.
Cervix	The narrow neck-like passage forming the lower end of the womb.
Data mining	Also called knowledge discovery in databases, is a term used to describe the process of analysing large amounts of data to identify patterns within data, or relationships among variables contained within the database.
Democratic Nursing Organization of South Africa	Publisher of nursing update South Africa magazine.
Groupware	Is application software designed to help people involved in a common task achieve goals.
Intrapartum care	Action provided by midwife to give maternity and neonatal care during labour and immediately after childbirth. Care of healthy women and their babies during child birth.
Latent phase	"A period of time, not necessarily continuous, when there are painful contractions; and there is some cervical change, including cervical effacement and dilatation up to 4cm" (White et al., 2012:2).
Level 1 hospital	Is the base hospital for a health district in rural areas; the functions are often integrated into professional healthcare facilities such as level 1 and 2 hospitals.
Level 2 hospital	It is a base hospital for the health region, which will include a number of districts. Level 2 hospitals frequently include functions of level 1 hospitals. It may be the base hospitals for nearby clinics and community health centers (MOU).

Level 3 hospital	Called a central or tertiary hospital.
Midwife	Nurse who has successfully completed a midwifery education programme / birth attendant who has to provide care for maternity and neonatal periods in different stages such as postpartum, intrapartum, etc.
Midwifery	The profession that provides expert care to all mothers and babies irrespective of complexity, during pregnancy, childbirth and the postnatal period within a family centred environment.
Nursing Update South Africa	A magazine used by nursing midwives in South Africa. It covers professional, labour, and health issues, and also features lifestyle articles.
Obstetric Care	The care of women during prenatal period, intrapartum period, and the postpartum period. Furthermore, obstetric care needed for the management of normal and complicated pregnancy.
Partogram	The paper form used by midwives to monitor and record patients' (pregnant women) progress during labour in midwifery and maternal hospitals.
Placenta	The placenta is an organ attached to a woman's womb during her pregnancy. The placenta is connected to the baby by the umbilical cord and the baby is inside a bag of fluid called the amniotic sac which is made of membranes. The function of the placenta is to provide oxygen and nutrients which pass from the woman's blood supply into the placenta. Furthermore, it keeps the baby's blood supply separate from the woman's blood supply and also enables the woman to carry out the functions that the unborn baby cannot perform for itself (NHS, 2013; Guttmacher et al., 2014: 1-2).
Workflow	Reflects the processes that an organization has created to coordinate the activities of different individuals, to ensure the successful completion of the work and to improve the overall efficiency of workers.

DEDICATION

I dedicate to the Blessed Virgin Mary Queen of Heaven and to the Lord Jesus Christ.

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Chapter One: Introduction to the Research

1.1 Introduction

In developing and middle income countries, for example South Africa, there is a paucity of research on the information needs and information-seeking practices of midwives. The purpose of this research was to explore the information needs and information seeking practices of midwives during the antenatal and intrapartum care environment. Knowledge related to information practice of midwives is a critical area in the health care sector. Additionally, information needs of health workers (midwives and doctors) are essential research fields of health sectors. Every day health professionals seek information as part of their work practices in providing a healthcare service in order to satisfy goals relating to patient care, or to achieve their tasks. The research focuses on the need for information by health professionals, and how they seek for this information. The results of this study may also be useful for the practice of midwifery and continuity of research in the health informatics field.

1.2 Background to the Research Problem

Dr. Jean Yan, Coordinator of Health professions Networks and Chief Scientist: Nursing and Midwifery at the World Health Organization in Geneva, declared that Nurses and midwives, being one of the largest groups of health care providers, are often the first point of contact for individuals and communities most in need (HIFA, 2009). Midwives have the responsibility to provide care and to offer necessary support and advice during pregnancy, antenatal, intrapartum, and postpartum care, and also provide care for infants. This care includes preventative measures such as the promotion of normal birth. However, they must also detect potential complications during the pregnancy and labour in the mother and child in order to access medical care or other appropriate assistance for dealing with the situation as an emergency. The midwife has an important task in health counselling and education, not only for the women, but also for their partners and family within the community. A midwife may practice in any setting including the home, community, hospitals, clinics, or health units (WHO, 2012).

Several studies have emphasised that nurses use a variety of information sources, both formal and informal, and take steps to obtain their own information, by means that include the use of public libraries, private purchase of journals, and contact with colleagues (Davies, Urquhart, Smith, Massiter & Hepworth, 1997; Baro & Ebhomeya, 2013:183-187). Williamson (1990) found that nurses regard their colleagues as their first preference when seeking for information. A study of nursing researchers during the 1900s found that nurses use libraries

as a primary source of information. They specifically indicated that the library staff assist them with finding information using the CD-ROM database, but found that little use is made of networked and online information (Badwden & Robinson, 1997:408-409). One of the information sources that nurses personally carry is the computer-tablet which ranked as their most frequently used information source. It contains their patients' medical records – address, phone number, insurance information, referring party, medical supervision, household composition, diagnosis, care plan, previous days' notes, and interdisciplinary coordination and communication (Pajarillo, 2007:7).

According to Abubakar and Handle (2010:1) "Nurses handle information all the time, including processes from patient counselling through recording of care reflection practice, with increasing emphasis on evidence-based practice; with the growth of internet, nurses will need to work with fellow professionals and patients in different ways, and nursing students will need to acquire more and more sophisticated information-seeking skills to cope with the new roles". Up-to-date information is very important – they substantiate their claim with many journal articles, papers, reports, and case studies. The codes of behaviour, attitudes, and values necessary to practice as a midwife need to be emphasized to ensure that these are considered through midwifery education programmes and through role models in every area of midwifery practice to improve their capabilities that ultimately will improve the quality of maternal healthcare (Kennedy et al., 2010:34-41).

Midwifery deals with all the aspects of the birth process — what happens before, during and after the birth of the baby. Midwives, as registered healthcare professionals, are qualified to provide a healthcare service to pregnant women. This service also includes advising pregnant women throughout their pregnancy. Midwives provide care during normal deliveries and also care for the baby during the perinatal period. Midwives have very specific information needs and need to continuously update themselves with current trends in the field of midwifery practices and research (Badwden & Robinson, 1997:410). Only relatively few studies have examined midwifery information needs, as distinct from those of other nurses (Irvine et al, 2012; Levine, 1993).

A small-scale study by McCrae (1989:134-145) found that midwives seem to not read widely or in-depth and found libraries to be mostly inaccessible. These findings are not generally in accordance with other studies of the area, which have suggested that midwives are a particularly information-conscious group, although problems with convenient access to information is a recurring theme. In addition, information need is a significance function of every day conversation. The communication among midwives and with colleagues when seeking information needed to make a diagnosis or give a directive varies in clinical settings.

The midwife also provides a patient with information and support necessary for making informed decisions (Mckenzie, 2004:685-686; WHO, 2012).

The information behaviour or practice of midwives is an important consideration and it deals with actions for understanding and seeking information to satisfy diverse needs. Information seeking is the consequence of a need to satisfy professional goals. While midwives seek for information they find information in paper-based sources, e.g. newspapers, magazines, etc., or in computer-based systems, e.g. the Internet. It is important to study the information-seeking behaviour of particular groups of people in order to understand the behaviour of human beings better – there is a need for multidisciplinary research in this regard (Abubakar & Harande, 2010:1). David Benton, Chief Executive Officer, International Council of Nurses (ICN) highlights that "a lack of accurate and current health information is a serious threat to patient safety and quality of care. ICN is determined to address this through initiatives such as the ICN's Nursing Mobile Library" (Healthcare Information for All, n.d).

1.3 Problem Statement

The information-seeking practices and communication needs of midwives in the antenatal and intrapartum environment are unclear and undefined.

1.4 Research Question, Sub-Questions and Objectives

Table 1.1: Research question 1, sub-questions 1 and objectives

Research problem	The information-seeking practices and communication needs of midwives in the antenatal and intrapartum environment are unclear and undefined.	
Research question 1	What are the information-seeking and communication practices based on the needs of midwives in the antenatal and intrapartum environment?	
Research sub-questions 1	**Research method(s)**	**Objectives**
What information is needed by the midwife to provide healthcare services in an antenatal and intrapartum environment?	• Semi-structured interviews • Case study	Determine what are the information needs of midwives in an antenatal and intrapartum environment.

How is the information sought by midwives?	• Literature analysis • Semi-structured interview	Describe how midwives seek for information in midwifery.
How is the information provided?	• Semi-structured interview • Literature analysis	Find out how they provide this information and how it can be adopted in midwifery.
Who/what are the information providers?	• Literature analysis • Semi structured interview	Identify who provides what information.

Table 1.2: Research question 2, sub-questions 2 and objectives

Research question2	How does the context influence the information-seeking and communication practices during the antenatal and intrapartum stages?	
Research sub-questions 2	**Research method(s)**	**Objectives**
What are the contextual factors that influence the care services in a MOU?	• Literature analysis • Semi-structured interviews	Establish the contextual factors of the MOU that could influence the maternal healthcare services.
How is information sourced and communicated during the antenatal and intrapartum stages?	• Literature analysis • Semi-structured interviews	Describe the information and communication flows during the antenatal and intrapartum stages.
How do midwives exchange information as they communicate with each other during the different phases of the antenatal and intrapartum stages?	• Case study • Literature review • Semi-structured interviews	Determine how the midwives exchange information as they are communicating with each other during the antenatal and intrapartum stages.

1.5 Research Design

Research design is the arrangement of a research “blue print” for collecting sufficient information to be conducted in an empirical research project to answer research questions (Bhattacherjee, 2012:35).

1.5.1 Interpretive Paradigm

The research is positioned in an interpretive paradigm and qualitative research methods were used to gather data by studying human behaviours from the perspective of the social actors themselves (Babbie & Mouton, 2001:288).

1.5.2 Research Methodology

A method or technique can be used in the research process to implement specific solutions related to the research problem. Research methodology refers to a collection of methods and techniques suited to a given research context (Mlitwa, 2011:70).

Case study is a research strategy used to explore or discover information (individuals or groups of participants) within the context of a research problem to answer research questions. The methodology was employed to explore information needs and information-seeking behaviour or practice of midwives in the antenatal and intrapartum care environment.

1.5.3 Sampling: Non Probability

Sampling is the process of selecting a unit of analysis to be studied. The purpose of this study is to gain an understanding of the situation or human behaviours in a midwifery community. A group of midwives “convenient” to the research problem area was selected via the use of non-probability (purposive) sampling. It is a technique conducted with the knowledge of the population to realize the aim of the study (Babbie & Mouton, 2001:166).

1.5.4 Data Collection Methods

Data collection methods employed are semi-structured interviews, literature reviews, and participation observations to gather primary data related to specific research topic.

The study used semi-structured interviews with practitioners in order to gain an in-depth understanding of information-seeking behaviour or practice of midwives. The interview would be employed to support qualitative data of information needs and information-seeking behaviour or practice (see Booth, 2000:101-111).

- **Semi-structured interview**: is a technique employed to gather qualitative data in the form of an in-depth interview between an interviewer and respondent. The researcher will use open-ended and closed ended questions, and allow the conversation to move freely but within the scope of the problem area.

- **Observation:** is a method of data collection used to observe or describe attitudes and/or behaviour of participants interacting in their daily environments to gain knowledge (Bless & Higson-Smith, 2000:103). Technology can be used to record information while observing participants.

1.5.5 Data Analysis

Thematic analysis is a qualitative research method used for description and coding data collected from research participants (Fereday & Muir-Cohrane, 2006:1). The data analysis process is started with a coding procedure. The coding procedure has either a deductive or an inductive approach. This research employed an inductive thematic process. Inductive thematic analysis is divided into six steps (see Chapter Three, section 3.5.1 and 3.5.2). The coding procedure starts with reducing the raw information by writing out the line of each unit of text (Fereday & Muir-Cochrane, 2006:2-4). In addition essomenic modelling was used to depict the midwives' journeys as they perform their tasks.

1.6 Delineation of the Research

The research was done within a Midwifery Obstetric Unit (MOU) in public healthcare, as the case is located in the Western Cape Province in the Republic of South Africa. Other parts of South Africa were not covered. It only investigated information needs and information-seeking practices of midwives in the antenatal and intrapartum care environment. The research did not include patients and no patient data was considered.

1.7 Contribution of the Research

This research adds insights to the information practices of midwives as they perform their care activities in practice with the potential to enhance the quality of health services. The research explored and gave understanding of the information needs and information-seeking behaviours or practices of midwives. This can be regarded as an important contribution to the midwifery body of knowledge, especially in terms of quality improvement.

1.8 Project Plan

The below table suggests the research period from May 2012 to March 2014

Table 1.3: Project plan

Research Action Plan from 2012-2014	May-Nov 2012	Jan-Jul 2013	Aug-Nov 2013	Jan-Jun 2014	Jul-Dec 2014	Jun-Aug 2015
Research Proposal						
Literature review						
Research design and methodology						
Data collection, analysis and interpretation						
Conclusions and recommendations						
Submission to the examiners						
Thesis submission for graduation						

"Milestone project management"

1.9 Study Layout

- **Chapter 1:**

  Describes a brief introduction of the study, background to research, problem statement, research question, sub-question and objectives, preliminary literature review, and research design.

- **Chapter 2:**

  Provides a literature review considering the information needs and information-seeking practices of midwives. Furthermore, it also considers the communication needs of midwives and health informatics.

- **Chapter 3:**

  Describes the research methodology and designs such as qualitative research, interpretive paradigm, a case study, and sampling techniques. In addition, the data collection, analysis methods, and an essomenic model are also described. The chapter concludesd with a discussion of ethical considerations, informed consent, voluntary participation, anonymity, and confidentiality.

- **Chapter 4:**

  Presents data analysis and interpretation of results. The researcher also demonstrates samples techniques, the themes identified by the study, and the role of the MOU.

- **Chapter 5:**

  Demonstrates the application of essomenic modelling to depict the midwives' journeys in providing healthcare services in the MOU.

- **Chapter 6:**

  Discusses the findings of the research and compares the empirical findings with the current state identified by the literature review.

- **Chapter 7:**

  Covers the conclusion of the research; summary of the chapters; research question revisited; concluding with recommendations and suggestions for future research.

1.10 Conclusion

Chapter one provided an introduction to the research project, background to the research, problem statement and research questions, and then briefly a preliminary literature review. The chapter also highlights the research design and methodology that was employed and used.

The next chapter introduces the literature review and the significance of the research context.

Chapter Two: Literature Review

2.1 Introduction

Chapter one provided an introduction to the research context. In this chapter, the researcher illustrates the key concepts identified during the literature review for this research study. In general, the information needs and information-seeking practice of midwives during the antenatal and intrapartum care environment has become an interesting domain of study in health informatics during this decade. Midwifery is a significant sector of healthcare services. This implies that investigating the information needs and information-seeking practices of midwives could lead to improved insights into the role of information and how it is used in midwifery. In addition, as indicated in Chapter one, the researcher explores information needs and information-seeking practice of midwives during the antenatal and intrapartum care. The research includes communication needs of midwives in the context of information communication, and information sharing and information flow during work practice environment. Again nurse midwives communicate and collaborate with colleagues while seeking information in order to deliver safe care to mothers during pregnancy and labour.

The purpose to use and share information is based on the information needs and information-seeking practices within the midwives' tasks. As indicated in Chapter one, it appears that limited research has been conducted on the information needs and information-seeking practice of midwives during the antenatal and intrapartum care environment in developing contexts, e.g. South Africa. In this exploratory study, the research focuses on the context of the essential information needs, information-seeking practice and communication needs of midwives in the antenatal and intrapartum care environment. However, knowledge of information needs and information-seeking practice of midwives is critical to gain more understanding of human behaviour or practice during decision-making. Furthermore, to establish how they seek for this information in a midwifery practice setting to meet their information needs, information seeking practice, and communication needs. Midwives should give personal attention to improve their behaviour or practice and communication with colleagues.

2.2 Health Informatics for Midwifery Practice

Health informatics is concerned with the use of information and information technology within healthcare (Hoyt & Bernstam, 2014:1-3). The development of health information systems and electronic health record systems within healthcare services needs to consider the information needs and behaviour or practice of all stakeholders. There is a need to understand the use of information and communication technologies (ICTs) to establish a

thorough understanding of the midwives' information practices. This understanding is essential in order to involve midwives in the design, development, implementation, and evaluation of future information systems. Health informatics could make an important contribution to support midwifery practices and to ensure that health informatics enhance several practices in the MOU — all to ultimately improve the health and well-being of patients (Bath, 2008:501). Health information technology has many benefits that could lead to the improvement and better quality of healthcare practices. When it is properly integrated into midwifery practices, it enables healthcare workers to better manage the patients' circumstances and to use the technology to advance national health and safety aims (Health Department & Human Services, 2013:8).

Consideration of informatics applications related to specific professions or health sectors is critical to make a contribution in health and medicine. The relationship between health, medical informatics, and health information management described below (figure 2.1), can be considered as three separate, but related overlapping domains. The overall aim of health informatics is to develop and enhance the organisation and management of information practice, and thereby improve the overall quality of care for patients. Bath (2008:504-508) lists a number of such systems: "storing medical images, decision support tools for patient management, architecture for an electronic medical record and data mining techniques for diagnosing clinical conditions, predicting clinical outcomes". Moreover, including electronic access to current research information, resources, and knowledge could improve midwifery practice and facilitate decision-making amongst midwives' teams (Randell et al., 2009:75-76).

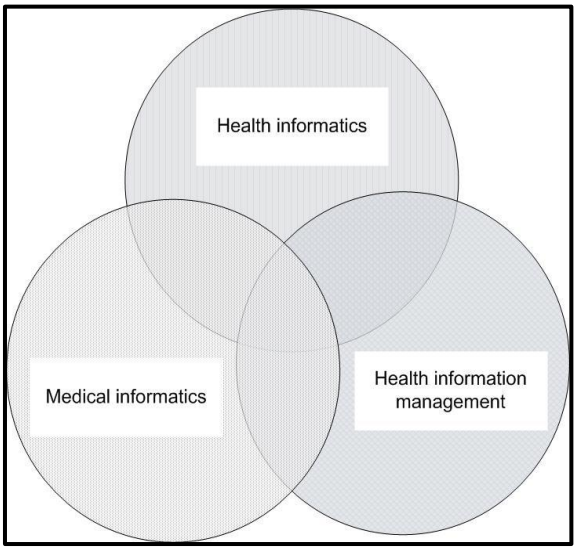

Figure 2.1: Diagrammatic representation between health informatics, medical informatics and health information management

(Adapted from Bath, 2008:503)

2.3 Maternal Healthcare Services

Maternal health service is a comprehensive process of healthcare assessment of women during various stages of pregnancy and delivery — antenatal, intrapartum, and postpartum — in order to ensure safe delivery (Penn-Kekana & Blaauw, 2002 cited in Holland-Muter, 2006:4). The care assessments are physical health, medical history, psychosocial issues, relationships, recent major stressors, and history of maternal illness (NSW Kids and Families, 2010:11). Basically, the purpose of the assessment is to understand and determine the care of womens' needs in a healthcare setting. It is crucial that women's health be introduced early in the antenatal period to maximise engagement with the services and for continued optimised support. Also, a care plan for women during pregnancy and birth is informed by the assessments and consultations that are provided by healthcare workers in maternity care (NSW Kids and Families, 2010:11-13).

In South Africa maternal health has a long history of providing healthcare services to mothers, babies, and families. Hence, maternal health services are internationally acknowledged as a priority for healthcare services development in terms of health workers professions and womens' health education (Penn-Kekana & Blaauw, 2002:1; Penn-Kekana & Blaauw, 2010:4). The intervention of maternal health is focused on ensuring that all women, mothers, and children receive these services as part of comprehensive healthcare services in South Africa (In Practice Africa, 2013:8-9). The purpose of this study is to indicate information needs and practices of midwives as part of the current status of maternal health services in South Africa. The midwives are engaged in every aspect of women health from antenatal stage to intrapartum and postnatal care in ensuring safe delivery of patients. Antenatal care is the period before and during pregnancy before birth. Intrapartum is the period during labour and delivery of the baby or babies, while postnatal refers to the period after childbirth.

2.3.1 Intrapartum Stage

Intrapartum care is an important stage in maternal health services. It is a significant period of events that could affect the patient, both physically and emotionally, in the short and long term (Kigenyi et al., 2013:1; NICE, 2014:4-5). Intrapartum care associated with a labour and delivery process occurs to women during childbirth in maternity care (Cronjé & Grobler, 2003:173). Within this stage all women must be examined and all the complications classified to determine the level at which patients should be managed (Medical Research Council, 2005:28). The progress of the intrapartum stage is documented using a partogram

that graphically depicts the progress of labour and maternity care (KEMH, 2014:1). A partogram is usually used as a record of a patient's care progress. The partogram is regarded as an accountability document in midwifery practice. For instance, a partogram encompasses various sections such as date and time of commencement of labour, age, weight, blood group, as well as any relevant obstetric and medical history and risk factors (KEMH, 2014:1-2).

Next the different stakeholders of maternal health care are discussed.

2.3.2 Patient: Pregnant Woman

A patient is a person who has a particular illness, or who needs check-ups of health conditions which requires her/him to attend a healthcare organization for medical treatment. Similarly, a patient who is a pregnant woman attends the midwifery unit or hospital for a subsequent check-up and treatment during the labour stage. Pregnancy is a vital journey of women and a life event, that takes her from the day she conceives, through each week of her pregnancy, to the day of delivery (Regan, 2013:6). This means that pregnant women need to receive healthcare services in the early stage of their pregnancy, especially in the antenatal period, intrapartum, and also for postnatal care. Further, during the antenatal period pregnant women make a series of appointments with healthcare workers, midwife, and sometimes with a doctor to make sure they are well. Healthcare workers should provide pregnant women with useful information that they may possibly need during her pregnancy period (Department of Health - NHS, 2009:40).

2.3.3 Midwife

The term midwife means "with women" and refers to a woman who assists other women during pregnancy and childbirth (Wickham, 2003:1). A midwife is a medical specialist of midwifery obstetrics that provides care for the women and babies during various stages of care (ICM, 2011). This care encompasses the management of various client circumstances, on-going delivery, and the detection of complications in women and children (Roland, 2007:1-5). So it is vital for midwives to promote appropriate maternal health services to women, babies, and families in a healthcare organisation environment (Roland, 2007:1). Midwives also have an important role in health counselling and education for stakeholders within a healthy community (ICM, 2011).

2.3.4 Midwives Referral to the Doctor

Midwives are responsible and accountable for the care of patients in midwifery units. There are various patient circumstances that midwives deal with and manage in midwifery units. However, in providing care to patients midwives are also responsible to decide when it is necessary to consult about the care of the patient with a midwifery colleague, or to refer the patient for further care and advice (Australian College of Midwives, 2008:10). Midwives use midwifery guidelines in a referral process in order to ensure safe delivery of the patients (Australian College of Midwives, 2008:10). For instance, if complications occur, midwives refer patients from midwifery to a doctor who is trained to deal with special situations in a hospital. In this sense, the guidelines are to promote a midwifery care system employing principles of close mutual collaboration between midwives and doctors. In addition, the guidelines are to facilitate consultation and integration of care between midwives and doctors (Australian College of Midwives, 2008:10). The referral between healthcare organisations requires adequate patient information that is relevant to the care situations in order for both sides to manage patients successfully (Ministry of Health, 2012:8).

2.3.5 Nurses

The word nurse was derived from the Latin word “nutritious” which means nourishing. Nursing has been known as the oldest of the arts and the youngest of the professions (Masson, 1985:13). Additionally, nursing is a field of the healthcare sector focusing on protection, promotion, and optimization of health and abilities, prevention of illness and injury through the diagnosis process, and care of patients in all types of environment (American Nurses Association, 2010:1; Briggs & Bell, 2009:289). Nurses are involved in the coordination, care, and collaboration with a variety of health professionals (midwives and doctors), families, and communities (WHO, 2009:14; United States of America & Institute of Medicine, 2011:7).

2.3.6 Administrative Staff

Administrative staff is defined as persons who assist heath care professionals such as midwives, doctors, and nurses dealing with a patient’s condition and care delivery in midwiferies, hospitals, and clinics. Part of the administrative staff’s responsibility is a task referred to as information management. In most health organizations administrative staff tasks encompass the assessment process and information processes required to collect, manipulate, maintain, protect, and retrieve information. Administrative management can also be seen as managing information, workflow, and patients’ procedure through healthcare

workers. The administrative staff's function is the sharing of responsibilities and accountabilities to satisfy their task of providing information required to support decision making of various health organisations (Erasmus et al., 2009:3-4).

2.4 Midwifery Information Practice

Midwifery in South Africa is part of one of the oldest professions in the world. From the beginning of the human race, women needed someone to assist them during the birthing process. Therefore, it is a major event and the midwife works with women in a partnership to provide appropriate care and quality services (Sellers, 1993). In South Africa, a midwife is recognised as responsible and professional in her own right and is accountable for her own acts and omission. In terms of the nursing Act, No. 33 of 2005 which repealed the nursing Act, No. 50 of 1978, the midwife must be registered with the South African Nursing Council (SANC) in order to practice midwifery as an autonomous, independent profession that bases its practice on scientific principles (Ayo, 2006:21; SANC, 2013:8).

The midwife obstetric unit (MOU) is an integral part of the healthcare system in South Africa. This means that most women will receive care in some form or the other from a midwife during childbirth. Data on the number of midwives vary depending on the source of information. The midwifery profession, similar to other health professions, is undergoing transition — in particular as it responds to the challenge of providing women-centered care (Foureur et al., 2009:47-49). As midwives increasingly take responsibility for the continuous care of women throughout pregnancy, during labour, and in the post-natal period, effective education and training for all aspects of the function must be available. The increased numbers of the three-year midwifery programme have provided an opportunity for midwives to address these needs and develop their own learning environments as well (Peach, 1999:5).

Midwifery is a practice based on a profession that involves caring for women and their families in the period from preconception through pregnancy to the first six weeks after the birth of the baby. A midwife is a healthcare professional, who provides the necessary support, care and advice during pregnancy, labour, and the postpartum period, to provide care for the neonatal and infant (WHO, 2009:14). The International Confederation of Midwives (ICM) found that the core clinical functions (content of care) of midwives are similar globally. The midwife is preferred as primary caregiver during normal pregnancy, birth, and the postnatal period. This includes new-born care, and is concerned with the after-care of women, neonates, and their families in a wide variety of settings in the community.

The midwife has the knowledge and skills to care for women and their new-borns. The style or form of midwifery practice varies greatly between healthcare systems due to contextual differences (SEAD, 2014). The task environment of the midwife refers to all the types of authoritative jurisdictions or mandates that define the structure and regulatory boundaries or demands for midwifery practice. In South Africa, the transformation of the healthcare system and higher education has had an impact on the role and function of the midwife. Midwives may find themselves doing many other tasks assigned to them by the setting, particularly if they are nurse-midwives (SEAD, 2014; Sellers, 1993). This is specifically the case in under-resourced settings similar to a developing context.

In South Africa, a midwifery as part of a Community Health Centre (CHC) is defined as being a comprehensive obstetric unit of maternity services in providing care for women during antenatal, intrapartum and postpartum care. It may also be called a midwifery obstetric unit, run and managed by midwives (Department of Health [DOH], 2007:14). The practice of midwifery is controlled by the laws of South Africa under midwifery regulations and guidelines. These laws allow midwives to be registered with SANC regarding midwifery practice. Midwives have a scope of practice in midwifery and play an essential role in health counselling, education, care of family, and the community. The community health centre also has a model of care — preventative measures, promotion of normal birth, the detection of complication in mother and child, the accessing of medical care or other appropriate assistance and carrying out emergency measures. Again, a midwife has a key role in promoting the well-being of women and babies in achieving the best health outcome in midwifery practice (Fraser & Cooper, 2009:3).

In addition, midwifery practice in South Africa is a comprehensive healthcare service that includes health assessment activities such as screening and referrals; therapeutic activities such as the prescription and administration of authorised medications; emergency treatment activities including the infusion of fluids and electrolytes, the use of forceps and suction; and also education and counselling together with family planning services (Abrahams et al., 2001:241). The South African healthcare plan provides for primary maternity services in certain areas of the country. In these primary care settings, midwives need to provide a comprehensive service to women, as often they are the only available healthcare professionals. With normal uncomplicated pregnancies they can work as independent healthcare practitioners, providing antenatal, intrapartum, and postpartum care. They may have difficulties in the case of complicated pregnancies since they may not have access to the necessary equipment or expertise to assist them in such cases. At the secondary and

tertiary level, the midwife works interdependently but in the case of high-risk pregnancy circumstances they are assisted by medical doctors (Abrahams et al., 2001:241).

The function of the midwife is to provide care, deliver babies, and engage in caring for mother and father before, during and after the child is born. Midwives are a critical source of support, information, and advice for expectant parents, and continue to play an important role with their post-natal services after the baby is born (Dawson, Turkmani, Fray, Nanayakkara, Varol & Homer, 2015:230). Midwives are in a position to deal with the worries and concerns of pregnant women and their families and are an important source of support for the mother (McLelland, Hall, Gilmour & Cant, 2014:e1-e2). Often expectant parents are anxious and nervous about the arrival of their babies, and they usually have many questions and concerns, especially if it is their first child. The midwife can help to reassure them and give them advice about parenting, labour, and birth (Wennberg, Hörnsten & Hamberg, 2015:1-2). Therefore, in order for women and their families to trust the midwife to take care of them during the pregnancy, it is essential that she conducts herself professionally at all times (Green, 2012:1).

2.5 Guidelines for Midwifery

Midwifery guidelines are intended to provide information enabling the midwife to integrate evidence with experience in providing midwifery care (Department of Health, 2007). The guidelines are dealing with the core roles and functions of midwives to deliver and ensure safe care of women and their babies in the midwifery obstetric unit (MOU) (Tharpe, Farley & Jordan, 2013:1-5). In South Africa (SA) midwifery guidelines are recommendations on the appropriate treatment and care of pregnant women during the different stages and for particular circumstances and conditions (De Kock & Van der Walt, 2004:4). Midwifery guidelines assist midwives in their work which aims to improve the quality of patient care and to support clinical decision making. It is important for midwives to be aware of the midwifery guidelines to ensure that safe practices result in the delivery of high quality healthcare services. Midwives need information guidelines for safe practice and to support women during labour for various circumstances (De Kock & Van der Walt, 2004:4).

In South Africa, the main guidelines are recommended and made by the National Committee on Confidential Enquiry into Maternal Deaths (NCCEMD). This acronym also refers to a report published by NCCEMD as guidelines for healthcare workers on maternal health care to enhance the conditions and services in hospitals and midwifery. The guidelines are based on the best evidence from published research, modified where necessary to suit local

conditions (De Kock & Van der Walt, 2004:4-5). The guidelines would be used most effectively if individual hospitals and MOUs draw up their own protocols based on their contexts, and adjusted to their own circumstances (De Kock & Van der Walt, 2004:4-5). The guidelines for maternity care are to give guidance to healthcare workers (midwives and doctors) on providing obstetrics services in hospitals and MOUs (Staunton & Chiarella, 2013:50-51). In South Africa, midwives use the guidelines in the hospital, with each hospital having its own levels of care and access to guideline information. South Africa has three types (or levels) of hospital (see Table 1 Glossary). Typically midwives need and seek these information guidelines as part of their work environment (Department of Health [DOH], 2007).

The International Confederation of Midwives (ICM) has developed global standards for midwifery regulations (ICM, 2011:1). The major goal of these standards is to promote regulatory mechanisms that protect the women and their families, and to ensure that competent midwives provide safe and high-quality healthcare to every woman and baby in their care. The aim of the guidelines is to support midwives to work autonomously in practice. By raising the status of midwives through regulating the standard of maternity care, the health of mothers and babies will be improved. The ICM developed essential competencies as the global standard for regulation and education as part of a professional framework that can be used by midwifery associations, midwifery regulators, midwifery educators, and governments to strengthen the midwifery profession and raise the standard of midwifery practice jurisdiction (ICM, 2011:1).

Clinical Practice Guidelines (CPGs) are a set of standard guiding guiding principle statements to support clinical activities and decisions about patients. They are used with appropriate healthcare in different situations, to enhance clinical performance, and also to support clinical tasks (Mei et al., 2012:416). Guidelines provide nursing midwives and the midwifery profession with a regulatory perspective that may guide the development of organisational policy. The guidelines assist nurses and midwives to understand their professional obligations in relation to specific aspects of nursing midwives (Du Plessis, 2007:6-15). Midwifery practice guidelines are addressing the core role of midwives to support women during childbirth (Nurses Board of South Australia [NBSA], 2008:1).

2.6 Information Needs of Healthcare Workers

Information needs are aspects of information demands based on some condition, viz. that people seek information to make decisions or to solve problems. Information originates and is generated because there is a need for or interest in it. The content of information is of primary concern. Objectivity of information is necessary for realising a function of midwifery.

Such information includes the needs of midwives that have to be satisfied. Information need is a partnership between information and information purpose (Prasad, 2000:8). The basic needs of health workers — i.e. the need for reliable, appropriate healthcare information and knowledge — is fundamental. Improving the availability of materials with relevant information to address health information needs does ultimately assist to enhance the quality of healthcare in developing countries (Pakenham-Walsh et al., 1997:90).

Devadason and Lingman (1997:41-51) indicate that the understanding of information needs and information-seeking behaviour of various professional groups is essential. Alternatively, it helps in the planning, implementation, and operation of information systems and services in work settings. Therefore, the working environment and the type of task that individuals perform to share their information needs, plus the different ways in which they acquire, select, and use this information refer to their information-seeking behaviour. Several studies have shown a relationship between task complexity and information needs of stakeholders (Wilson, 2000). Understanding midwives' information needs, and from whom they receive information in their work practice environment is essential to ensure the conducting of quality care. Therefore, the most frequent information need is related to treatment during information-seeking practices of healthcare professionals. Most information to communicate with patients using relevant information is retrieved from different sources — such as patients' medical records (Rutten et al., 2005:250).

Midwives are the largest group of users of maternal healthcare systems in South Africa, and they play an important role in Midwifery Obstetric Unit settings and hospitals. Midwives spend most of their time during their work environment with patients, considering and dealing with several maternal related circumstances. Again, midwives handle patients' information all the time in a work practice environment. However, midwives use different resources of information such as internet, library, electronic databases, CD-ROM, and magazines, to learn more about their specific needs and everyday practices. Information needs and information-seeking practice is studied in a multidisciplinary education field that is — in this case — in the healthcare services domain. There is a paucity of research in information needs and information-seeking practice of midwives, particularly in the intrapartum care environment.

Much has been written in past centuries about the general needs of healthcare professional such as midwives and doctors (Pakenham-Walsh, 2012). It has been mentioned that while it is necessary to attract and retain sufficient numbers of healthcare professionals, what is at least as important is to meet their needs. Healthcare professionals have a spectrum of seven

basic needs that have been described by the acronym SEISMIC for “Skills, Equipment, Information, Structural Support, Medicines, Incentives (including a decent salary), and Communication facilities” (Pakenham-Walsh, 2012:11). Therefore, Leydon et al. (2000:909), indicate that a research focus on health information needs of healthcare professionals, especially in a health organisation, should be considered as important. In addition, at the global and national levels, meeting the health information needs of health care professionals is important to provide for satisfactory patient care. Furthermore, health professionals need up-to-date, sufficient information in formats useful for policy development, programme management, and services delivery (D’Aamo et al., 2012:23-24; Global Health Workforce Alliance, 2010:1-2).

Andualem et al. (2013:1-2) highlight that health information and information needs are critical to update healthcare professionals’ knowledge and experience. Evidence based on informed decisions best serve their patients in health care organisations. In developing countries, there are several health care professionals who have no access to the practical information that they need during their work practices. So, the majority of them work through their own experiences to success — or failure — and further collaborate with colleagues (Pakenham-Wash & Bukachi, 2009:1-2). For instance, De la harpe et al. (2010:53-54) agree that at global and national levels information needs of healthcare professionals are important to consider as an important component to improve health care services to patients and address their well-being. Furthermore, it is important to ensure accessibility to information sources when needed by healthcare professionals in healthcare settings.

2.7 Information Seeking Practices of Healthcare Workers

Information-seeking practice or behaviour is the currently preferred term used to describe the different ways in which human beings interact with information, and particularly the different ways in which people seek and utilise information. Information behaviour is also the term of art used in libraries; information science, and health informatics, referring to a sub-discipline that engages in a wide range of types of research, conducted in order to understand the human relationship to information (Wilson, 2000:49-50). Information-seeking is referring to the communication activities through which individuals or groups try to establish a meaningful order of things. Everyday information-seeking such as occurring at work, home, hospital, and various organisations specific to different kinds of situations, show how people can seek information as defined in Everyday Life Information Seeking (ELIS) (Savolainen, 1995:267). An information-seeking practice or behaviour is not isolated in time or space, but

rather something that people do in the varied contexts of their daily lives (Savolainen, 1995:267).

Midwives' information-seeking practice is the act of achieving information from different resources such as knowledge of a colleague (midwife or doctor), sometimes with the use of technology. Information seeking starts with the information needs of midwives, followed by collecting, analysing, and filtering according to the information need that is then eventually transmitted to their work practices. Therefore, healthcare professionals seek and access information from diverse sources regarding patients' diagnosis and treatment for the resolution of problems based on patients' healthcare condition (Rebecca & Jadesola, 2013:331-332). Midwives retrieve the information from several information resources such as colleagues, documents, electronic medical records, and medical textbooks (Shin et al., 2012:524-525). Baro and Ebhomeya (2012:183-184) indicate that information needs and information-seeking behaviour or practice of nurses and midwives are critical for assisting them to access and use the information resources required to achieve the purpose of the tasks in the work setting environment.

Midwives' knowledge and skills come from their education, training, and experiences based on their information-seeking practices. Parts of nurses' knowledge are developed and increased from their seeking and using of information, plus managing information when they encounter clinical problems. Nursing, data and information, particularly research information, come from various sources that could be paper-based or electronic. These resources are interpreted, transformed, and developed to be nursing knowledge, and to become part of their experience base (Wakeham, 1993:85-86). With so much information available, healthcare professionals in the 21st century should have competencies in information seeking practices and problem solving in healthcare settings (Just, 2008:3). Research reports that it is necessary for midwives to seek and utilise information also from digital information resources to utilise in their physical work practices (Dee & Stanley, 2005:213-220).

Consequently, information seeking practice refers to an essential human behaviour for seeking and using information based on the information needs of a specific role (Case, 2012:3). O'leary and Mhaolrunaigh (2012:379) indicate that in decision making, midwives access and seek other sources of information, especially from colleagues which they regard as the most important sources of information for them. Therefore, the main purpose of information-seeking practice, whether as individual or team, encompasses both information needs and information retrieval to satisfy their care needs in midwifery (Akporido, 2013:27-28). Midwives need to be able to retrieve important information from relevant sources of

information when needed in time to accomplish their tasks (Ajayi, 2005:121-122). Essentially, midwives collaborate and coordinate to seek very important information for their practices in an everyday work environment (Talja & Hansen, 2005: 113-134 cited in Reddy et al., 2010:74). Furthermore, healthcare professionals collaborate and communicate with each other to accomplish these tasks in their work setting environment (Newman et al., 2007:1-2). They need information to communicate with each other.

Next a model for information seeking behaviour is considered to identify all the aspects of information seeking and information retrieving behaviour.

2.8 Model of Information Seeking Behaviour

Wilson's model (1981) considers the needs and other factors affecting information-seeking behaviour or practice (see Figure 2.2). Accordingly, the model describes the concepts in psychology and multidisciplinary fields such as a health informatics domain. Wilson identified three categories of basic human needs, and suggested that these drive information-seeking behaviour or practice. These basic human needs categories are:

1. Physiological needs.
2. Affective or emotional needs, such as the need for achievement.
3. Cognitive needs such as learning a skill.

Wilson's model describes information needs and information seeking behaviour or practice, and satisfaction of needs during work in the context of the work environment. The model indicates that these needs are affected by the person's environment and role. Also, the model illustrates human behaviour or practice in the work environment, for instance performance of tasks and the processes of planning and decision making. The model describes the needs of stakeholders for themselves and the systematic information searches that occur in the workplace environment. However, in this model personal, interpersonal, and environmental factors may also affect information seeking behaviours or practices in the physical environment. Also, Wilson's model indicates the importance of satisfying the information needs of an individual in order to make decisions on the basis of beliefs with full information, and the availability of information sources (Robson & Robinson, 2013:178-179).

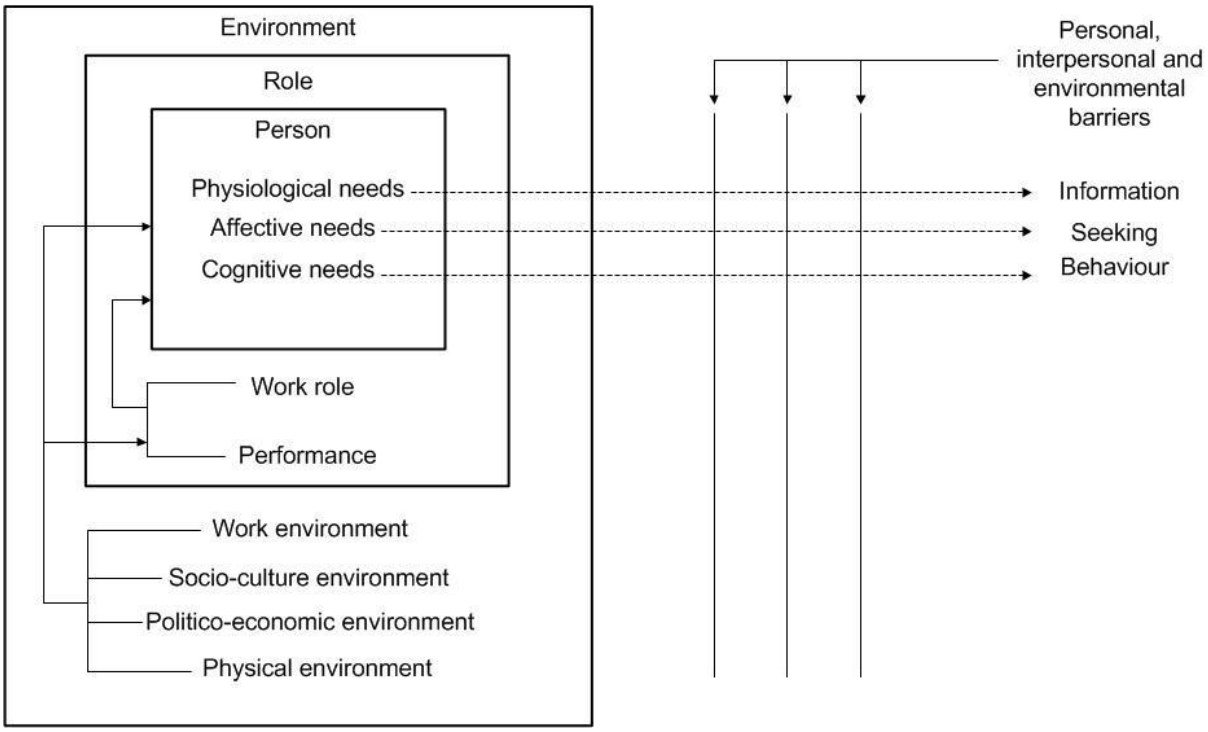

Figure 2.2: Wilson's 1981 model of information-seeking behaviour

(Adapted from Robson & Robinson, 2013:179)

The model is used in this study as an example of a model for the information seeking behaviour of a person, in this case the midwife, in the role of providing healthcare to pregnant women in the environment of a MOU. Differentiating between physiological, affective, and cognitive needs falls outside the scope of this study. Furthermore, only the work context is considered. Wilson's 1981 model is the basis of many similar models that Robson and Robinson (2013) considered in their study of information behaviour models to extend information behaviour to also include communication.

2.9 Sources of information in a Midwifery Practice

Midwifery information sources are materials and resources that have been established by organisations to accomplish certain goals and acts. Such information sources typically include books, journals, internet, videos, and other types that are used by individuals. However, healthcare professionals utilise and deal with diverse information sources in health organisation settings (Cluett & Bluff, 2006:3-4). In their application within the work environment; midwives require the information sources during their work practices to deliver patient care (Ebenezer, 2015:156-165). Midwives use different types of information sources such as midwifery guidelines, midwifery protocols, patients' medical records, and medical textbooks (McArdle, Flenady, Toohill, Gamble & Creedy, 2015:58). However, in some critical

situations midwives need access to additional information sources to provide care of patients in the MOU. In developing countries, health workers need to access and use comprehensive, relevant, and accurate information sources in order to satisfy their patients' care needs (D'Aamo et al., 2012:25).

2.10 Information Providers in a Midwifery Practice

The role of healthcare providers is to provide healthcare services governed by the department of health in both MOU and hospital settings. Midwives work as individuals and in teams. Based on their care practices they also provide information related to patients' care in their work settings. The healthcare authority plays an essential role in providing materials and resources required by midwives to perform their care services. These resources include information resources such as the basic antenatal care (BANC) protocol, guidelines for maternity care, and publications such as, obstetric magazines. The information provided should meet the heath care professionals' information needs in providing and delivering safe care of patients in MOUs and hospitals (Global Health Workforce Alliance, 2010:1-3). Midwives also provide information to colleagues (midwives and doctors) in order to manage patients' circumstances. Healthcare professionals have a responsibility to provide information of good quality to ensure that adequate, relevant and reliable information is available when needed (Global Health Workforce Alliance, 2010:1-3).

2.11 Communication Needs during Work Practices in Midwifery

Communication is originated from the Latin word Communis which means to share. Communication is the function of exchange and flow of information and knowledge occurring through speech, writing, signs, or behaviour. It is the meaningful exchange of information between two and in a group of persons. The definition of communication is any act by which one person gives information to or receives information from another person such as for example information about that person's needs, desires, perceptions, and knowledge, or affective states (U.S.Army, 1983). The important context of communication needs of midwives requires an effective communication practice in the work environment in the MOU. Midwives communicate with colleagues in planning and facilitating the care of patients, to seek information, to make decisions, and to solve problems. According to the Nursing Midwifery Council (NMC) it is necessary that midwives inform and share information with colleagues when they are working together to ensure the safe and quality care of patients (Nursing Midwifery Council, n.d).

A healthcare team meeting is an essential aspect of healthcare functioning and effective communication between all members is needed in the workplace environment (Cooley,

1994; Gage, 1998:17-26). Effective communication between team members is important for successful collaboration on patients' care and decision making (Abramson & Mizrahi, 1996; 270-281; Fagin, 1992:295-303). The communication is necessary for midwives to be in a position to provide good holistic care; they must be able to communicate at all levels in a hospital for the care of patients. Midwives communicate with all nurses, other midwives, and doctors in the team to contribute to their care of women (Gibbon, 2010 cited in England & Morgan, 2012:1). In developing countries, findings of healthcare professionals' communication needs indicate that they communicate to manage patients on different levels of the healthcare system. For example, communication occurs whether it is the midwife supervisor to staff, or midwife to another midwife colleague in the MOU (D'Adamo et al., 2012:24-25).

Communication needs encompasses both information-seeking practices of midwives and communication practice. Information practice or behaviour in its widest sense includes communication and provision of information. Thus information practice or behaviour defines or refers to "management, use and communication of information, and information seeking" (Ingwersen & Järvelin, 2005:259). The information-seeking approach, based on problem-solving perspectives of human practice or behaviour, has been the dominant approach encountered within the field, library, and several multidisciplinary health organizations (Spink & Cole, 2006:25-35). The model is particularly indicated to describe the information seeking activities in the context of communication practice and includes the role and activities of information providers (Robson & Robinson, 2013:185-189).

Information communication of health workers is increasingly recognised as essential to success in the work settings environment (Schwartz et al., 2010:1). Information sharing and communication is the core process of team workers collectively to utilise their information sources regarding their task environment and safe patient care (Mesmer-Magnus & Dechurch, 2009:535-536; Moorman, 2007:173-175). So, it is critical for healthcare teams' to share and communicate their knowledge and experience during their tasks in the work environment (Wright & Endsley, 2008:97-98). Every day healthcare professionals transfer and share knowledge or information among themselves to make vital healthcare decisions in the health organisation (Schwartz et al., 2010:2). Importantly, midwives consider communication and sharing of information as significant to manage high risk situations in the midwifery obstetric unit (MOU) (Thomas & Dixon, 2012:42).

Communication and collaboration in healthcare is defined as healthcare professionals working together in performing their tasks while also being aware of each other when making

decisions (O'Daniel & Rosenstein, 2008:1-2). Moreover, communication is negotiation based on information exchange between healthcare professionals to decide about the patients' care as they access and record patients' information in healthcare settings (Edwards et al., 2012:1-3). Similarly, communication practices of healthcare professionals are known to be important in narrowing the gap between healthcare professionals and improving patients' healthcare outcomes (van Bekkum & Hilton, 2013:2). In this sense, communication is an important instrument of healthcare professionals' interaction with and exchange of ideas, care plan, and other patient documents to manage patients' care and to make decisions (Sakyi, 2010:158-159). According to Haq and Hafeez (2009:102) communication among healthcare professionals is a key to successful task performance especially during the planning of follow-up occurrence and referrals between health organisations (2009:1-2).

2.12 Information and Communication Flows in Health Organization

Information and communication flow is the information sharing between and within organisations through processes, circumstances, and activities to realise specific goals and to make decisions. Furthermore, information flow practices are the core of midwifery tasks with patient information continuously being shared. Information and communication flows are based on midwives' activities at different locations in the healthcare setting. Although the role of information in decision-making is well-known, it also plays a vital role in coordinating work activities and providing awareness of other care activities. Therefore, an understanding of information flows in midwifery is core to facilitate successful patient care. Flows of information connect the MOUs, units of hospitals, and laboratory results related to the procedure of midwifery care (Reddy et al., 2004:229-230). In addition, health information and communication flows are defined in information sharing and exchange during midwives' seeking practices. Moreover, healthcare delivery is based on a collaborative process between midwives and possibly doctors when treating patients (Brady et al., 2012:50-56). For instance, healthcare professionals share information through patients' information records, document repositories and also as part of a documents retrieval process.

The concept of an information and communication flow is used here to refer to the manner in which communication of information takes place among midwives information-seeking practices or activities in their work environment (Tang & Carpendale, 2007:219). The information communicated during their work activities through medical information — such as a patient's diagnosis — and midwifery guidelines are used in practice to ensure continuing safe patient care. It is necessary for midwives to ensure that information is actively placed where information can be retrieved (Tang & Carpendale, 2007:219-220). Additionally, healthcare professionals need effective communication to share information among each

other for successful — and correct —diagnosis and delivery in a health organisation (Vallette & Caldwell, 2012:127-129). Also, the information flow includes a process of diverse activities of midwives and the provision of information during the work practice settings' environment (Robson & Robinson, 2013:169-170). Similarly, information and communication flows among different healthcare professionals in collaborative care especially between midwifery and hospitals in providing care of mothers and babies.

2.13 Cooperative Work in a Midwifery Practice

In most cases midwifery is based on collaborative teams that work together, communicate, share, and exchange information in order to make appropriate decisions or implement successful tasks (Kennedy et al., 2010:933-934). Collaborative work is a vital manner for knowledge and resource sharing based on people working in the same environment to achieve better communication (Rhee et al., 2008:1). The purpose and dimension of cooperative work allows midwives to collaborate, coordinate, and communicate in the work practice environment. The cooperative work becomes necessary for midwives in midwifery to care for patients at different times and at different locations. Midwives provide care for pregnant women after childbirth and during antenatal and intrapartum care so midwives need concrete cooperation with colleagues due to several activities that require exchanging of documents during these stages. The cooperative tasks are concerned with midwives sharing information and communicating with each other and with other team members during information-seeking practices (Bendoukha, 2002:1-2).

2.13.1 Computer-Supported Co-operative Work

The phrase Computer-Supported Cooperative Work (CSCW) was first established by Greif and Cashman in 1984 to demonstrate the concept of an interdisciplinary workshop. He invited researchers and interested individuals to consider how the computer might be used more effectively to support people in their various work activities (Grudin, 1994:19-26). Three years later, in 1987 Dr. Charles Findley presented the concept of collaborative learning work (Findley, 1989). According to Carstensen and Schmidet (1999), CSCW addresses "how collaborative activities and their coordination can be supported by means of computer systems". Therefore, CSCW is services and information technology designed to support a group of people to enable them to work collaboratively in their work environment — such as groupware (see meaning in glossary of terminology "groupware") (Mills, 2003:666).

CSCW aims to describe and analyse the behaviour of the people working together and the role of CSCW aims to create computer systems that address the requirements of

cooperative work teams. The prescribed requirements are successful CSCW systems. As mentioned in the above section, the term Groupware, refer to CSCW as related to computer networks that enable teams of people to work cooperatively in the organisation. Groupware includes “sharing programmes, video-conferencing software, and software for tracking document changes, electronic-mail software, and software to support the collaborative viewing online system”. Workflow is another phase often used to refer to CSCW. Workflow deals with the particular situations and support formal work processes from the scope of Groupware which is usually considered to be software that supports collaborative work teams (Mills, 2003:666-667).

The domains of CSCW studies expand several multidisciplinary functions of how people collaborate with each other and the role that technology plays in this collaboration for a wide variety of organisational settings. Nursing midwives could benefit from this particular technology to improve the group collaboration and the activities in the MOU. The provision and implementation of CSCW in the MOU could improve the design and deployment of medical information systems such as Electronic Medical Records (EMRs). In general, the aspects of CSCW are relevant to health information as “how does technology fit into the work process (workflow)”. Other research disciplines have recognised the importance of social and cognitive analysis. For example, Human Computer Interaction (HCI) has played a prominent role in exploring how people interact with technology in a variety of ways (Butler et al., 1998: 105-106; Dix et al., 2003 cited in Pratt et al., 2004: 128-133).

2.13.2 Computer Supported Collaborative Information Seeking

Computer Supported Collaborative Information Seeking (CSCIS) is a domain of multidisciplinary research concerned with how people can seek information and collaborate among each other through information sources (documents, notes, medical textbooks, electronic medical records) using technology to support their tasks in a work setting. CSCIS relates information seeking, information retrieval processes, and information exchange in a specific workplace setting (Reddy & Spence, 2008:243; Stahl et al., 2006:209). A collaborative information seeking environment is important and useful when the task is too complex for a single individual to resolve the problem. However, it is important for team members to collaborate when dealing with a complex problem during information seeking practice or behaviour (Yue & He, 2010:1). Reddy and Spence (2008:242) point out that “Individuals rarely work independently in modern organisational settings” — instead they work on different tasks as multifunctional teams in a work setting environment.

Information needs and CSCIS practice during antenatal and intrapartum care is an essential aspect of midwifery practice. Therefore, information seeking practices and management activities are a prominent aspect of everyday work. In the midwifery obstetrics unit information plays a significant role, not only in decision making but also in coordinating, communication face-to-face with colleagues and providing awareness of other activities. “One key element to team success is their ability to work together to seek information efficiently and effectively” (Reddy & Spence, 2008:242-243). The goal of collaborative information seeking is to assist midwives in a specific task through coordinated and shared information activities with colleagues during their practices in the work environment.

In particular, the midwives team faces numerous challenges to seek and find information needed in order to provide effective patient care (Reddy & Spence, 2008:243). They indicate that firstly, patient information is often located in multiple resources — for instance, the patient medical records are perhaps in one place and lab results in another place. Therefore, the midwives team must find all the different pieces of information and combine and integrate the different information pieces. Secondly, midwives must treat patients quickly because of the constant backlog of waiting patients. Therefore they need to find information as quickly as possible. Finally, midwife teams cannot afford to make mistakes so they must ensure that the information they use is correct and accurate. Because of these challenges, collaboration during information seeking activities is essential to support the work of midwife teams in the Midwifery Obstetric Unit (Reddy & Spence, 2008:243). The relationship among the users of a computer-based system on the one hand and effective communication in a group with team related information seeking activities on the other hand, is essential in the context of any work environment. Midwives among each other seek information and manage activities, information flows, and information retrievals in MOU through a computer system (Lim et al., 2007:40).

Collaborative information retrieval is based on activities that a group or team of midwives did together to identify the information needs and to make appropriate decisions. Information retrieval is based on the information needs, when information is located, accessed and obtained, and evaluated based on an information need for a specific purpose. Collaboration information retrieval involves the same activities but it also includes communicating about the information needs, and sharing the retrieved information with each other as part of working as a team. Computer supported collaborative information seeking and retrieval uses technology to assist midwives in a work practice environment to collaborate with each other or with other teams or healthcare professionals for identifying information needs effectively in the MOU. Importantly, these technologies include tools for searching, sorting, and filtering

the shared repository, facilitating access by any member of the midwives team to the information system from different locations in the MOU such as for example, electronic medical records (Poltrock et al., 2003:239-246).

An important aspect of CSCIS is the context of the information to be used in a particular work practice environment. The phrase “sense making” has been used in a variety of fields and is considered an important aspect of information seeking tasks. However, there has been little research conducted on collaborative sense making (Paul & Reddy, 2010:1-2). Midwives collaborate during seeking information, retrieving, sharing, understanding, and using information together in midwifery or MOU. Thus, an important aspect of the process of finding and using information in collaborative work is creating a shared understanding of importance and to make sense of the information (Paul & Reddy, 2010:1-2).

2.14 Conclusion

This chapter focused on information practices, information needs and information seeking practices of midwives in their work environment. The reviewed literature describe midwifery guidelines and provide brief discussions about sources of information within the model of information-seeking practice. The chapter further presented communication needs and practices of midwives in aspects of information sharing and information flows during information seeking practices in the work setting environment to model information seeking behaviour or practice. A major purpose of this chapter is to present the importance of information needs and information seeking practice of midwives and the significance of research in developing countries particularly in MOUs typical of a developing context in South Africa. Although technology is not used as part of CSCW in the case of his study, it is included in the literature review to consider it for future use.

The next chapter discusses research methods and designs that were employed to conduct the research study. The interviews were conducted with midwives to gather data from participants in the Elsies River Midwifery Obstetric Unit.

Chapter Three: Research Methods and Design

3.1 Introduction

The previous chapter described the concepts relevant to the study from the literature reviewed. This chapter introduces the research methodology employed for the study. It is necessary for the researcher to design the methodology according to the research problem, and by using the selected methods to collect and analyse empirical data whereby the research questions will be answered. The chapter provides an overview of the proposed research techniques to be used for data collection, as well as the process of analysis. The research includes in depth semi-structured interviews, sampling procedures, data collection methods and instruments, data analysis and interpretation, and ethical considerations. A case study was used as qualitative research strategy as it makes it possible to investigate the information needs and information seeking practice of midwives during the antenatal and intrapartum care environment. The research took place in the Western Cape Province in a selected midwifery obstetric unit (MOU) as a case study involving nursing midwife participants to gain knowledge for the study. Data was collected and transcribed during the period from July 2013 until November 2013.

3.2 Research Design

Research design refers to the plan and strategy or research "blueprint" related to the research topic, and activities that will guide the process to obtain actual results. The purpose of research design is to ensure that the research process is accomplished according to the objectives (Blanche et al., 2006:34-35). The research process was designed to explore information needs and information seeking practice of midwives during antenatal and intrapartum care, and suitable and appropriate methods were used. "The main function of research design is to enable the researcher to anticipate what the appropriate research decisions should be so as to maximise the validity of the eventual results" (Mouton,1996:107).

3.2.1 Qualitative Research

Qualitative research uses several methods to explore human behaviour and describe the situation related to work environment in the real world (Snape & Spencer, 2003:2-3). Qualitative research includes in-depth interviews, focus groups, observation, and case studies. Qualitative research is useful for achieving insight into situations, to provide in-depth description of activities, to record knowledge, and for including opinions from respondents

about a particular situation. Often qualitative research can provide insight which is not possible to elucidate regarding social behaviour. It can be described as “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem”. The process of research involves the phrasing of suitable research questions, procedures, and data collected in the setting of the study (Lemanski & Overton, 2011:1).

In this particular study, information needs and information seeking behaviour of midwives during antenatal and intrapartum care in the MOU are researched. Qualitative research plays an important role in exploring midwives’ behaviour when they seek information during work practice, and also to describe their activities when they interact with diverse situations during information seeking practices. Similarly, qualitative research allows the researcher to study the participants in their own environment, typical of their everyday practices. Qualitative research allows for the researcher to interpret the situation as the participants make sense of their practices. These practices are observed and the data captured represents their sense making as recorded in field notes, interviews, conversations, photographs, recordings, and memos to themself. At this level, qualitative research assumes a subjective view of the research setting. This means that the qualitative researcher studies things in their natural settings and tries to make sense of the practices and the meaning the research participants attach to them (Denzin and Lincoln 2000:3 cited in Snape & Spencer, 2003:2-3).

The overall purpose of qualitative research is to obtain rich descriptions using narratives. During interviews the researcher also attempts to capture conversations, experiences, perspectives, voices, and meanings to be analysed. Therefore, qualitative research attempts to achieve an understanding of how people make sense in their diverse situations, and to describe how people interpret what they experience (Willis, 2008:40; Merriam, 2009:14). Qualitative research has multi-methods that could be ethnography, grounded theory, discourse analysis, content analysis, narrative analysis, and interpretative paradigm (Hancock et al., 2009:10; Joubish. et al., 2011:2083). This research study employed qualitative research in the context of the interpretive paradigm, to explore midwives’ behaviour and expand understanding about midwives’ activities during information seeking practice in the Elsies River Midwifery Obstetric Unit.

3.2.2 Interpretive Paradigm

The interpretive research paradigm encompasses the knowledge of information that has been gained or collected from individuals as they participate and use social constructions such as language, consciousness, shared meanings, documents, tools, and other artefacts to attach meaning to what they do. Moreover, an interpretive paradigm is based on human

behaviour and sense making, aiming to produce an understanding of social interaction and individual behaviour (Klein & Myers, 1999:69, 74). According to De Villiers (2005:12-13) an interpretive paradigm focuses on describing human behaviour, interaction, meanings, and documents in social and organizational contexts. Thus the interpretive paradigm is used in this study to explore the information needs, information seeking behaviour, and practices during the antenatal and intrapartum care and midwives' activities from the point of view of all midwives in the Elsies River MOU. In addition, in the interpretive paradigm used for this research, the communication practice of midwives during information seeking and decision making is described in a natural work environment.

This research study focused on midwives' behaviour and actions, an aspect of midwives' activities during the antenatal and intrapartum care, since for interpretive paradigm the researcher attempts to understand the situation through considering the meaning that participants assign to their actions (Rowlands, 2005:84). Therefore, knowledge and meaningful realities are established in and out of interaction between humans and their work environments that are developed and transmitted in the organizational context within a social context (Crotty, 1998:42). Here knowledge is seen to be a process of making meaning through interaction and communication (McKenna, 2003:218). However, the human can only be understood from the standpoint of the individuals who are participating in the study (Cohen et al., 2007:19). So the interpretive paradigm aims to explore and discover what is hidden in social and organizational context (Scotland, 2012:12).

3.3 Research Methodology

The research methodology is based on providing guidance, driven by methodological approaches which are conducted in the research process and meet specific requirements, to answer the research questions and realize research objectives. The actual functions of the research methodology are to discover the practices of midwives during information seeking and decision making. In this sense, appropriate methods were designed for the research study. These methods or techniques were employed to explore the knowledge pertinent to the topic of study and to discover answers of research questions through the procedure of collecting data, observation, taking notes, sampling, and analysis.

3.3.1 Case study research

Case study research is a research strategy used in the research process to study and explore organizational behaviour, including individual and group behaviour, as well as understanding and exploring work communities (Baxter & Jack, 2008:544-545). In a case

study, complex tasks that occur in the processes of an organization are discovered. A case study in health sciences could be used to collect scientific information in various health domains such as clinical, midwifery, hospital organization, and communities (Taylor & Francis, 2013:119). The research context for this qualitative research study assumes an interpretive paradigm and a case study is a suitable research strategy within qualitative research. Case study research is often used in qualitative research to gather data through participation observations, in-depth interviews, and focus groups. So, qualitative research is suitable for a case study where the research data is collected in natural and real life situations or environments. A case study is an important means of describing a situation in the work place environment (Aaltio & Heilmann, 2010:67-68).

The overall aim of the case study is to deal with situations which are examined; observed, described and analysed in order to record vital information and provide insight into important processes (Hamilton, 2011:2; Yin, 2009:17). The essence of the case study in this research was to explore information needs and information-seeking practices of midwives in the antenatal and intrapartum care environment. The researcher also explored communication practices during antenatal and intrapartum care in the described midwives' situation in a real environment. The major focus of the case study in the site used for the case was to observe and collect data about the midwives' behaviour, practices and activities. In addition relevant ocuments were analysed to gain knowledge about the role of the documents in the information and communication practices to answer the research questions (Simons, 2009:43-67). The purpose of the case study method is to ensure that the topic of the research study is well explored (Stake, 1995; Yin, 2003 cited in Baxter & Jack, 2008:544-545). The study used a single case to explore the midwives' information practices in a real-life situation without trying to generalise.

3.3.2 Sampling

A sample is representative of the study population from which the participants are selected to gain sufficient knowledge of the research topic (Bloor & Wood, 2006:153). Sampling methods have two general categories, namely probability and non-probability sampling. In probability sampling, the entire population is known, with the probability of anyone being selected, and sampling occurs by a random process. Probability sampling includes: random sampling, systematic sampling, stratified sampling, cluster sampling, and multistage sampling. Non-probability sampling is based on selecting participants through a non-probability sampling process (Gravetter & Forzano, 2009:133-140). This research focuses on non-probability sampling which will be discussed in the next section.

3.3.3 Non-Probability Sampling

Non-probability sampling is a technique in which the probability of selecting individuals from the population is unknown (Bhattacherjee, 2012:69). Furthermore, non-probability sampling is a process of sampling that does not give all members in the population a chance to be in the sample (Daniel, 2012:66). For example in midwifery, the researcher conducted the interviews in a midwifery obstetric unit, among midwives operating in that unit, in order to gain knowledge about their information needs and information seeking practices during the antenatal and intrapartum care. The sampling technique was non-probability sampling as the researcher chose, from a limited number of available midwives, a target group of midwives who have the knowledge about the research topic. There are several types of non-probability sampling: quota sampling, snowball sampling, convenience sampling, and purposive sampling (also called judgmental sampling). This researcher used a purposive sampling technique as appropriate sampling process for the study context.

Purposive sampling (also called purposeful or qualitative sampling) is a type of non-probability sampling. Purposive sampling techniques are based on choosing an appropriate number of units for the study (Teddlie & Yu, 2007:80). Moreover, purposive sampling is based on a specific purpose rather than selecting participants randomly (Tashakkori & Teddlie, 2003:713 cited in Teddlie & Yu, 2007:80). The researcher employed purposive sampling in the process of studying a group of midwives' behaviour and also as applicable to qualitative research, where the researcher wants to study a particular group. As a qualitative research study and relevant to exploration of human behaviour, the researcher needed an appropriate sampling strategy to represent the result of the study through the group that was chosen (Given, 2008:562). The researcher used purposive sampling and engages with a certain group (member of the populations). The midwives who participated in the study were the ones who were working during the data collection phase and who had time for an interview. The observations were done during the normal practices of the midwives with the researcher observing from a place where his presence was according to acceptable norms for ethical behaviour, and would not interfere with the work.

3.4 Data Collection Methods

Research data collection is an essential step of the research process in providing the information needed to answer the research question and that will meet objectives of the research. In the data collection procedure the researcher collects primary and secondary data to obtain actual knowledge from individuals. Qualitative research data collection methods include observation, in-depth interviews, individual interviews, participating in

setting and analysing documents (Marshall & Rossman, 2006:97; Marshall & Rossman, 2010:137; Mlitwa, 2011:76). The core aim of the research data collection is to provide insights into participant views and actions by collecting information through interviews and observations. Furthermore, interviews, observations and documents were used as suitable to collect data as part of this qualitative study (Jebreen, 2012).

3.4.1 Interview

The interview is a critical data gathering method involving verbal communication between the researcher and the participant in a work environment setting (Fox, 2009:4). It is a discussion between researcher and participant to capture information relevant to the research study. There are several types of interviews used in qualitative research; the two main types are the unstructured interview and semi-structured interview (Bryman, 2001:312-313). This research focuses on semi-structured face-to-face interviews to gain in-depth understanding of the individuals in their work environment. The purpose of the qualitative research interview in the midwifery obstetric unit is to obtain the views and experiences in their information practices in a real life environment. Semi-structured interviewing is the most widely employed method in qualitative research to obtain this information (Bryman, 2001:312).

A semi-structured interview is a qualitative data collection method in which the researcher asks participants a series of predetermined but open-ended questions (Ayres, 2008:811-812). The semi-structured interview in qualitative research is a comfortable and suitable method to capture the information and the social interaction occurring in their environment, and to learn more about the participants' experiences (Rabionet, 2011:563). In a semi-structured interview the researcher has a list of questions and themes in a specific topic that need to be covered. Also, a semi-structured interview is an opportunity for the participant in a face-to-face interview to explain and to help the researcher understand events and the behaviour of the participants (Bryman: 2001:314). It is important for the researcher in the interview session to build a rapport and to connect with individuals so they can feel comfortable when providing the information.

This research study used semi-structured interviews to collect empirical data in face-to-face sessions. The researcher started an interview by introducing himself to the participant and explained the purpose of the research study (see Appendix D). The researcher obtained permission to collect data from the participants and assured them that their rights as participants would be protected. The researcher established a rapport with participating midwives to create a suitable environment so that midwives would feel free and comfortable to provide the required information. In a letter of informed consent, the researcher described

the confidentiality aspect; informed consent, and the use of the results within the protection of rights of the individual participating in a research study (see Appendix C). The researcher used audio recording to gather the information and complemented this with written notes and observations which will be described in the next section. Essentially the researcher documented the responses to probe deeper meaning and understanding. The initial interview question guide was compiled from the themes identified through the literature analysis, but was refined through the observations and document analysis.

3.4.2 Observation

Observation is a method of data gathering strategy in which the researcher is present in the setting to record the activities and events as they occur in a natural environment (Mathison, 2008:286). Observation is a fundamental and highly important method in qualitative research. It is used to explore interactions in natural environment settings to describe the events and behaviour (Marshall & Rossman, 2006:98-99). The role of the researcher in this context is taking notes, recording voices, sounds, and images, and asking questions that are designed to uncover the meaning behind the behaviours. Additionally, the point of observation is to observe and learn about the things human beings do in their work environment or in their social life. Essentially, observation is collecting information in certain ways unique to the individual setting that is being studied (Guest et al., 2012:75-83).

The researcher observed and participated as an observer in the study community's daily activities according to the ethical considerations applicable to this study. The research took place in a community setting. Generally, the researcher engaged with the community and made objective notes about what he saw, recording all events, occurrences, and observations as field notes (Mack et al., 2005:13). Observation, a qualitative method, helped to focus on understanding midwives' behaviour, practices, and activities within its natural setting. Observation was selected as an additional data collection method to obtain deeper insights into information seeking behaviour or practices during the antenatal and intrapartum care environment that may not have been possible through using only interviews (Iacono et al., 2009:40).

The researcher noted the behaviour of the participants in the context of describing behaviour, interaction, practice, and collecting data in a natural situation (Gravetter & Forzano, 2009:353). As noted, during observation the researcher recorded exactly what occurred during the midwives' practices in their work environment in the MOU. In addition, it was essential that the activities of the participants were not interrupted or disturbed as a result of the observations by the researcher simultaneously gathering his own information for

the study (Gravetter & Forzano, 2009:353-355). The benefit of observation is to obtain a deeper understanding of the information needs and information-seeking practices in the ERMOU (Gooden, 2006:29).

3.5 Data Analysis

Data analysis is a process and procedure of transcription and interpretation of data collected from individuals during the research process to answer the research questions. Analysis is descriptive summaries of what the participants have said and also describes the participant's views particularly in information need and information seeking practice or behaviour of midwives during the antenatal and intrapartum care environment (Lewins et al., 2005). In the data analysis approach the researcher transcribed the semi-structured interview conversations, data collected through observations and through the notes taken during the observation period as well. Furthermore, the researcher intensively repeated reading material which had been transcribed in order to avoid and correct errors in the interview transcriptions (Flick et al., 2004:253-254). The purpose of data analysis is to categorize and code the pieces of data and combine them into themes. Also the researcher employed inductive thematic analysis as indicated in Chapter One, as well as essomenic modelling to describe a midwife's journey during work practice environment to further analyse the data.

3.5.1 Thematic Analysis

Thematic analysis is a method used in research to identify and analyse themes that emerged as being essential to the description of the phenomenon (Fereday & Muir-Cohrane, 2006:1-5). Moreover, inductive thematic analysis is based on the qualitative data analysis approach employed in multidisciplinary research such as the health sector and behavioural activities that occur in an organization. The procedures start by reading through textual data, identifying themes in the data, coding those themes, and then interpreting the structure and content of the themes (Guest et al., 2012 cited in Guest, et al. 2012:13). Thematic analysis provides flexibility for approaching research patterns in two ways — inductive or deductive coding. The research employed inductive thematic analysis as a comprehensive process to deal with observational data and data collected through an interview during the antenatal and intrapartum care environment. The researcher identified patterns (themes) within data gathered in answering the research questions (Alhojailan, 2012:39). All the findings were validated with a qualified midwife familiar with the setting of the case at ERMOU.

In addition, the process of inductive coding consists of six stages as indicated in this chapter (see Figure 3.1). Also the diagram represents the process of each stage occurring during the coding procedure. The researcher employed inductive coding in the analysis of the data of

this study on the information needs and information-seeking behaviour or practice of midwives. The process is described as a systematic step-by-step process in the section below (Crabtree & Miller, 1999:163-177; Boyatzis, 1998).

3.5.2 Stages of Data Coding in Thematic Analysis

The chart shown in figure 3.1 represents each stage of coding

Stage 1: Developing the code manual

The choice of code manual for the study was important, because it served as data management tool for organizing segments of similar or related texts to assist in interpretation.

Stage 2: Testing the reliability of the code

An important step in the development of a useful framework for analysis is to determine the applicability of the code to the raw information.

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Stage 3: Summarizing data and identifying initial themes

The process of paraphrasing or summarizing each piece of data enters information “into your unconscious, as well as consciously processing the information” (Boyatzis, 1998:45).

Stage 4: Applying template of codes and additional codding

Using the template analytic technique for identifying meaningful units of text in the study context.

Stage 5: Connecting the codes and identifying themes

Connecting codes is the process of discovering themes and patterns in the data.

Stage 6: Corroborating and legitimating coded themes

The final stage illustrates the process of further combining the findings of the themes that were previously identified from the coded text. Corroborating is the term used to describe the process of confirming the findings.

According to Thomas (2003:2) the purpose of the general inductive analysis approach in this research was:

- To condense extensive and varied raw text data into brief, summary format
- To establish clear links between the research objectives and summary findings derived from the raw data and to ensure that these links are both transparent (able to

be demonstrated to others) and defensible (justifiable given the objectives of the research)

- To develop a model or theory about the underlying structure of experiences or process that is evident in the text data

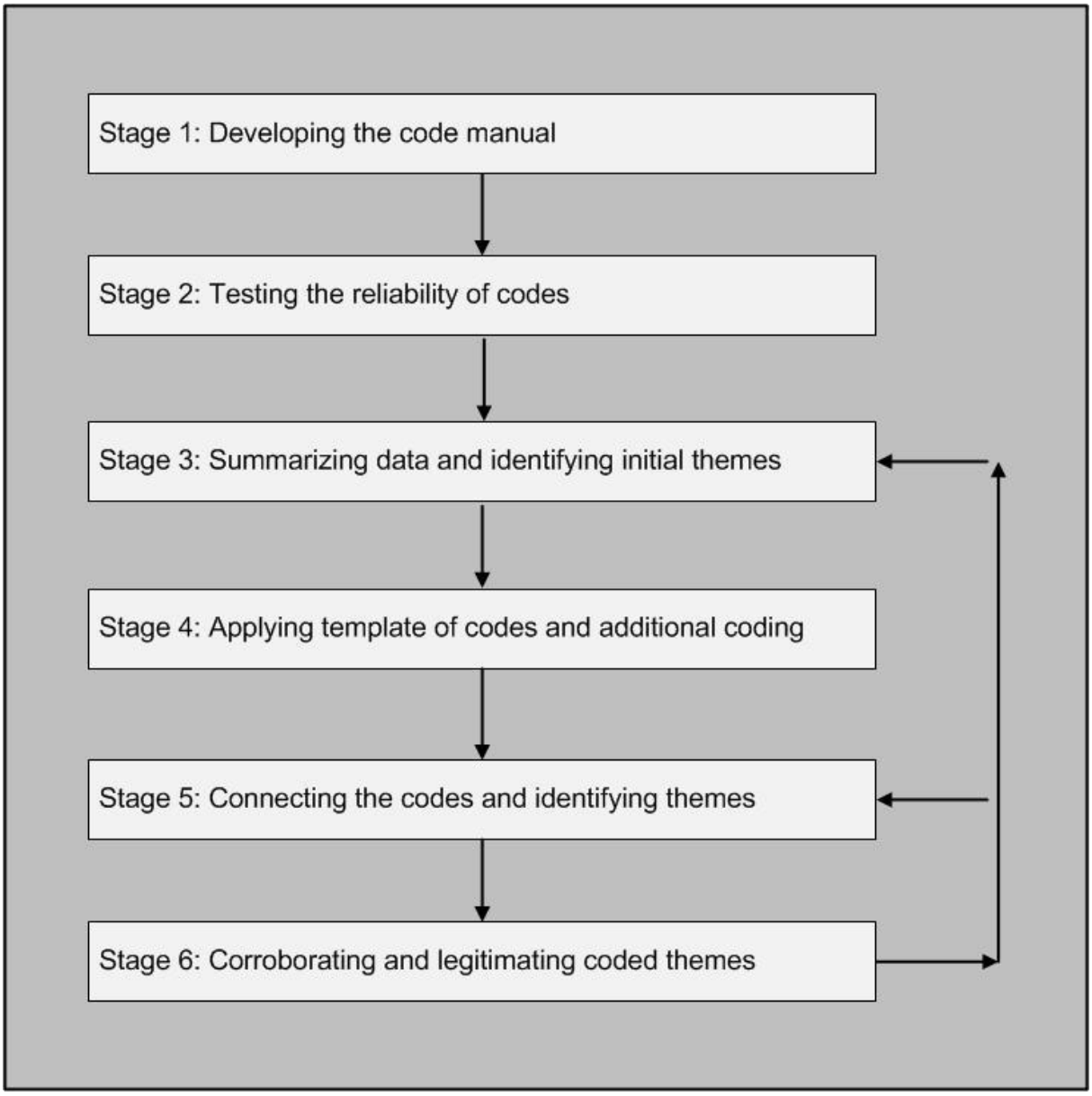


Figure 3.1: Diagrammatic representation of the stages undertaken to code the data

(Adapted from Boyatzis, 1998, and Crabtree and Miller, 1999)

3.5.3 Application of Essomenic modelling to analyse data

The essomenic model is a technique based on stakeholders' journey mapping which is used to describe staff roles, handling task, equipment used, communication process, and physical environment (Cummins, 2012:12). The model describes the day of journey in a real work

environment as well. The essomenic model is also used to enhance the stakeholder journey process and the overall quality improvement (Curry et al., 2006:4726-4727). In this research, the essomenic model is used to explore and identify midwives' journeys during the work activities environment. The purpose of this model was to describe the midwives' tasks and activities that occur during the antenatal and intrapartum care environment. Furthermore, the model played an important role in the exploration of midwives' behaviour or practices and communication during the antenatal and intrapartum care environment within the case study environment (in the selected midwifery obstetric unit or MOU). In addition, the model described the information flows and information communications during the antenatal and intrapartum care environment. Finally, Chapter Five will describe the essomenic model in the context of midwife behaviour or practice during the antenatal and intrapartum care environment as occurred in the selected MOU.

In Figure 3.2, the different notations used in essomenic modelling are indicated.

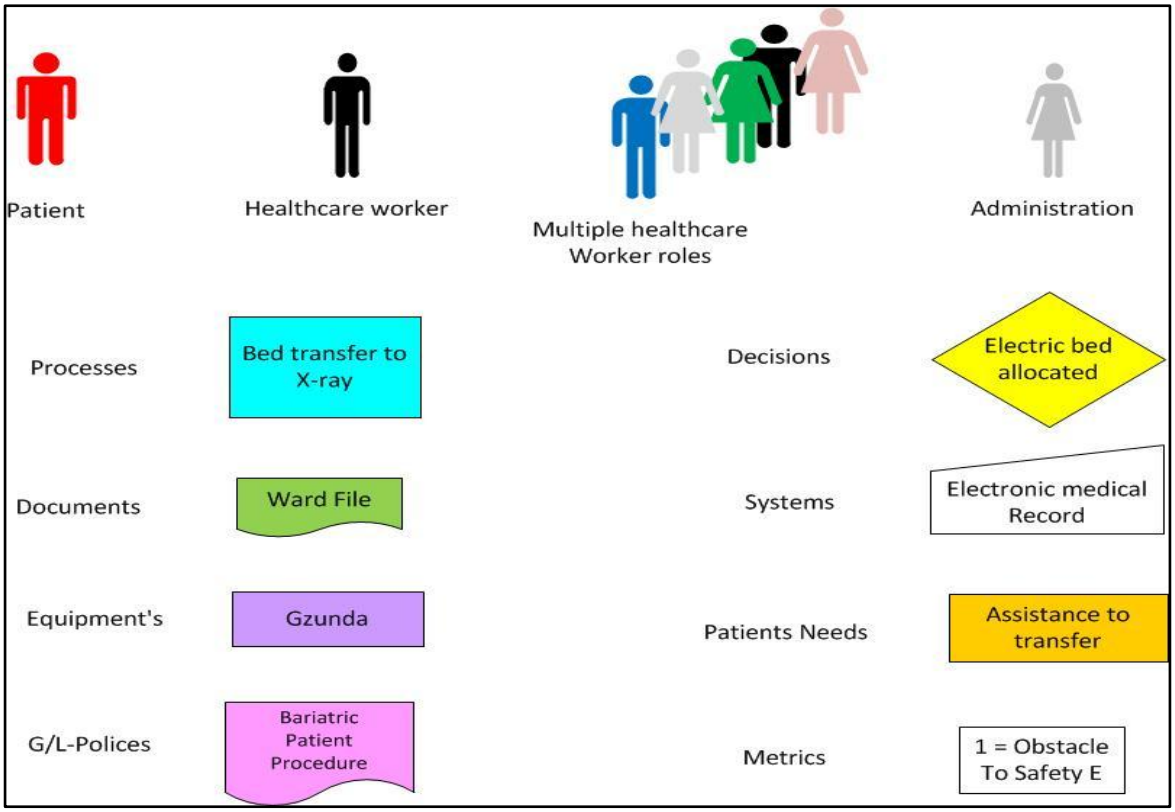


Figure 3.2: Essomenic Architecture

(Adapted from Cummins, 2012:13)

Figure 3.2 presents the symbols used for staff and workflow cues in the software. Table 3.1 gives the layer names and their illustrations. The research context presents various

midwives' journey activities in their work practice environment. Further explanations of the application of the essomenic modelling for the selected MOU follow in Chapter Five.

- Each layer uses colour and various workflow shapes as cues
- Different coloured figures represent people such as staff, staff services and patients
- Models are read top to bottom and left to right

The different journeys modelled are then analysed to identify pressure points that are then presented as findings.

Table 3.1: Essomenic Patient Journey Modelling Layer name and descriptor for the study

Layer Name	Content Description
Patient Movement	Presents when, where and how many time patients are transferred or assisted with treatment during their journey.
Staff Roles	Presents what role of midwives, doctor, nurse student, and nurse assistant took place or was involved in the journey.
Processes	Names and relates the manual handing processes involved in the journey.
Communication / Information Creation	Presents information communication and flow of information as paperwork to systems that are required by the processes or midwives notes.
Equipment	Presents the equipment used in the process.
Policies / legislation / Strategic objectives	Names the policies / legislation / strategic objectives that must be adhered to during the enactment of the processes.
Metrics	Details the measurements that are used to determine the effectiveness of the stakeholder journey.

(Adapted from Cummins, 2012:13)

The essomenic models were validated with the co-supervisor who is a qualified midwife and familiar with the processes at the ERMOU since she is also the head of advanced midwifery at a university that uses the ERMOU as a training clinic.

Next the ethical considerations that inform this study are discussed.

3.6 Ethical Considerations

Ethical considerations examine what is acceptable in a research study according to international ethical norms. Ethics represent an acceptable agreement between the researcher and the participants in the research data collection, analysis, and dissemination processes. This agreement demonstrates the proper and improper behaviours when

conducting ethical research (Babbie, 2013:63-64). The researcher requested permission from both institutions namely, the university (CPUT – Faculty of Informatics & Design) and the Western Cape Provincial Health authority. The researcher obtained approval letters from both these organizations to conduct research interviews in the Elsies River MOU with participants (see Appendices A, B). The purpose of this approval letter is to protect participating researchers, supervisors, and institutions from any harm that can emerge in which participants could make claims of inappropriate behaviour. It is, therefore, essential that the researcher be conscious of the basic research ethics (Polonsky, 2004:53).

The goal of this research project was to seek information from individuals without any harm and collect accurate information for this study. It is my responsibility to respect participants and to gain their trust. Where possible, the researcher attempted to build rapport and to enable comfortable conversations. The participants were fully informed about the purpose, methods, and intended uses of this study. The researcher informed the participants what the research entails. There are three initial conditions for the ethical conduct of international research: (1) that the participants have an opportunity at the beginning and during the research to provide input into the purposes, goals, and methods of the research; (2) that the research design includes mechanisms to generate knowledge that has the potential to benefit the participants and their organisation; and (3) that there is an ethically justifiable reason to target the population from which the participants will be recruited. Also, specific attention is needed to consider the enrolling and continuing participation of the participants, to assess the benefits and risks and to show respect to the participants (Olsen et al., 2003:127-128).

According to Schnell and Heinritz (2006:17), “Research ethics addresses the question of which ethically relevant issues caused by the intervention of researchers can be expected to impact on the people with, or about whom, they research. It is concerned in addition with the steps taken to protect those who participate in the research, if this is necessary” (Schnell & Heinritz, 2006:17 cited in Flick, 2011:215). The application of ethics in research is important to ensure that the researcher is able to perform the research (refer to the method used in research study); respect the participants; and also avoid any harm for the participants (Flick, 2011:215-216). For example, the researcher considered the ethical issues and avoided any questions that affect midwives (physically, mentally, emotionally, socially, and psychologically). Additionally, the researcher avoided any harm or compromising of privacy during observation of midwives’ practices or behaviour in the antenatal and intrapartum care environment. The researcher was informed that consent was addressed as one of ethical guidelines and respected the participants’ choice to participate.

3.6.1 Informed Consent

Informed consent is “the process of agreeing to take part in a study based on access to all relevant and easily digestible information about what participation means, in particular, in terms of harms and benefits” (Parahoo, 2006 cited in Gelling, 2011:2). Informed consent is also the permission granted to the researcher in research investigation involving individuals or a human subject (Brodbeck, 2007:466). The researcher provided informed consent letters to each participant in order to make participants aware of the principles of informed consent and the process of obtaining informed consent before they embark on the research (Gelling, 2011:2-3). In addition, the informed consent form explained the purpose, value, and clarity on how the data would be collected, used and disseminated (Mlitwa, 2011:80).

3.6.2 Voluntary Participation

Voluntary participation is a human subject from multidisciplinary domains, organizations and communities involved by their own choice in the research through informed consent. Voluntary informed consent is globally accepted as a guideline for research and it needs to meet specific requirements for obtaining informed consent from humans (Marshall et al., 2006:1989). In this research context, midwives participated voluntarily and the researcher obtained informed consent from each participant as part of the data collection process. Participants were informed that no one would be forced to participate, And that they could stop their participation at any stage. The researcher explained the need for informed consent (see Appendix C). The researcher made sure that all the participants in the research understood the process in which the midwives would be engaged; including why it is necessary; how it would be used; and how and to whom it would be reported (Gardner, 2011:5).

3.6.3 Anonymity and Confidentiality

Anonymity and confidentiality are relevant but different aspects. The dictionary defines anonymity as: “of unknown name, of unknown authorship” and defined confidentiality as: “spoken or written in confidence and charged with secrets” (Wiles et al., 2008:417-418). In the context of research ethics, anonymity means that the identities of individual respondents are either anonymous or kept secret. Confidentiality is commonly understood as akin to the principles of privacy and respect for autonomy (Oliver, 2003; Gregory, 2003 cited in Wiles, 2013:41-54). Moreover, confidentiality is the information collected from individuals during the research process that will be kept in a secure place, protecting the anonymity and confidentiality of the participants and the data (Wiles, 2013:42; Babbie, 2013:68-70).

Anonymity and confidentiality are necessary conditions in research for participation, data protection, and dignity.

The researcher gathered information from midwives during the study period and transcribed the information considering anonymity and confidentiality. The participants signed letters of informed consent as an agreement to guarantee that their data would be protected and used positively, in context of the study, and according to sound research ethics principles. The midwives participated voluntarily. A condition indicated in the letter of informed consent was that they would not be harmed nor were they forced to participate. Also the researcher did not divulge any names or details relating to their participation. Once the researcher has completed the research project, the coded list of participants has to be destroyed as described in the letter of informed consent (see Appendix C). Therefore, the real identities of the participants are then located only in the memory of the researcher, and these memories will diminish in the course of time (Oliver, 2010:79).

3.7 Conclusion

The purpose of this chapter was to describe the research methodology of this study about the information needs and information seeking behaviour of midwives in an antenatal and intrapartum care environment. The chapter presented the case study of the selected MOU and highlighted the qualitative aspects of the research context. The research strategy used was a case study to explore midwives' practices and procedures and their activities in a real-life situation. Furthermore, data collection methods were employed as semi-structured interviews and observations to collect empirical data. Therefore, the chapter covered the methods of data analysis and ethical considerations as well. The design of this methodology was aimed at enabling the researcher to gain deeper information about this study in the MOU.

The next chapter presents the analysis and interpretation of the results and findings.

Chapter Four: Data Analysis and Interpretation of Results

4.1 Introduction

In Chapter Three, the researcher discussed the research design and methodology used in collecting qualitative data of this study. The next step is data analysis and interpretation of results which depicted the study of the information needs and information-seeking practices in the antenatal and intrapartum care environment. The study also considered the communication needs of midwives. This chapter discusses the analysis and interpretation of the results and findings. Data was collected through semi-structured interviews with and observations of the individual midwives in the Elsies River MOU. The researcher analysed the data into meaningful categories in order to make sense of each relevant theme. The objective of the research study was to identify and explore the study context in order to answer the research questions. The study conducted research in the Elsies River MOU in the Western Cape, South Africa. Figures 4.1and 4.2 provide the context of the MOU in the Western Cape province in South Africa and its location in Cape Town.

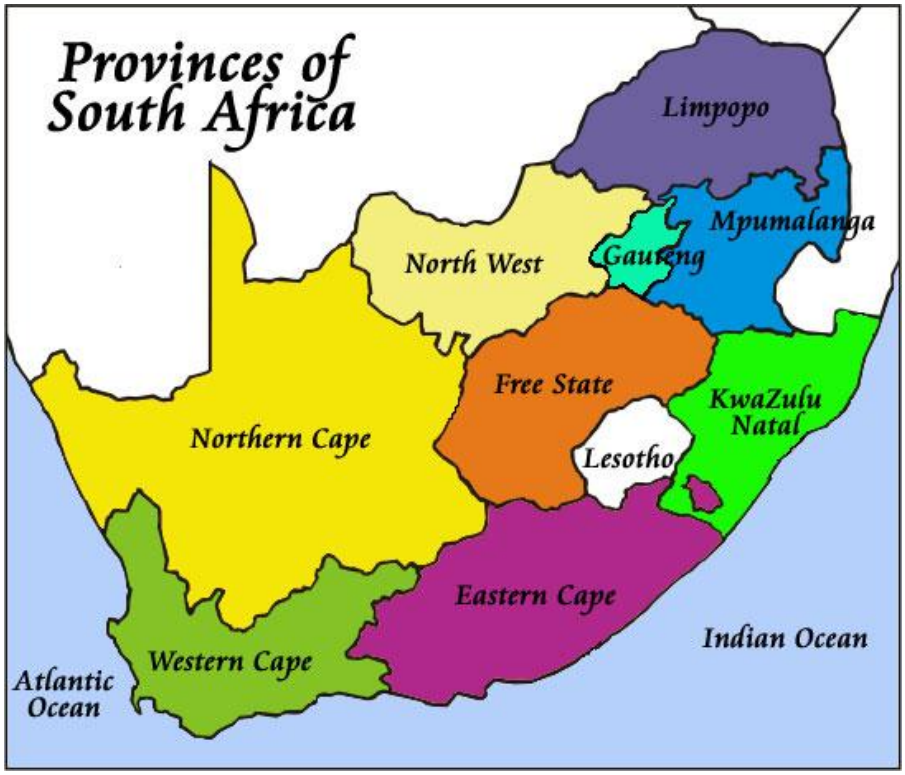


Figure 4.1: Map of South Africa Provinces

(Adapted from Explore South Africa, n.d)

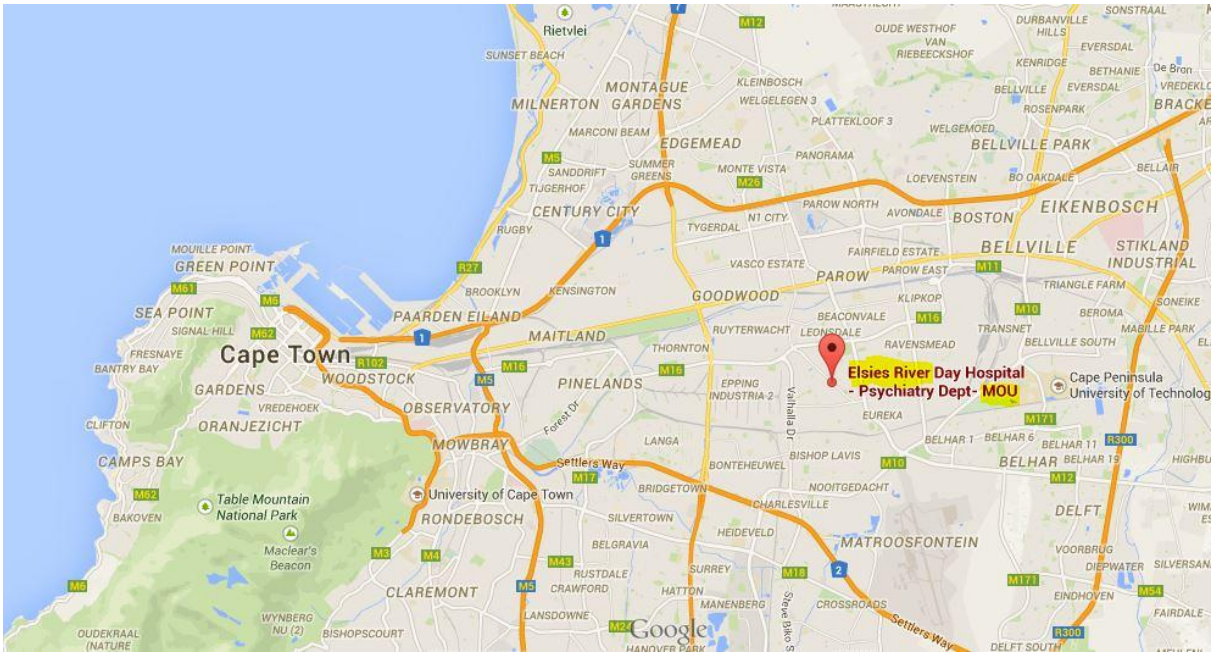


Figure 4.2: Elsies River

(Adapted from Google map, n.d)

South Africa has nine provinces (see Figure 4.1). The research took place in the Western Cape Province in the suburb Elsies River as a research case study (see Figure 4.2). The Elsies River Midwifery Obstetric Unit is located in the Western Cape Province, in a suburb of Cape Town city.

The City of Cape Town manages clinics in eight sub districts that provide community-based and primary healthcare services in community health centres (day hospitals) and Midwife Obstetric Units (MOUs). Other healthcare services include comprehensive and specialised healthcare services in regional, district, and provincial facilities. The Elsies River Midwife Obstetric Unit (MOU) is a maternity hospital, a provincial government health facility, in the Tygerberg Eastern Health District of the Cape Town Metro Region. Pregnant women are referred to maternity services of MOUs, but if complications occur they are referred to the next level hospital. In the Tygerberg Eastern sub district, pregnant women with complications are referred to Karl Bremer Hospital, a district or provincially aided hospital. The next referral level from Karl Bremer hospital is to the Tygerberg hospital, a tertiary hospital managed by the Western Cape Department of Health.

Between 200 and 250 antenatal women visit the ERMOU per month with about 60 bookings per day being women with a low-risk pregnancy. The ERMOU handles between 90 and 130 low risk deliveries per month. There are 8 midwives in the labour ward and there are a

minimum of 2 midwives per shift. The antenatal clinic has 3 midwives and 2 enrolled nurses assistants per shift. Women who are in labour report directly to the labour ward for assessment and observation. They are managed through the delivery and until 6 hours postnatally, when they are discharged home.

The researcher received permission from the Faculty of Informatics and Design, Cape Peninsula University of Technology (see Appendix A) and the Western Cape provincial health authority (see Appendix B) to access the Elsies River MOU. The researcher considered the ethical issues, while obtaining information from individual midwives in order to conduct research in the Elsies River Midwifery Obstetric.

4.2 Elucidations of Sample Technique

The researcher conducted the research interviews with nine individual midwives in the Elsies River MOU. The purpose of sampling was to select the target sampling for the study and to explore the information needs and information seeking practices in the antenatal and intrapartum care environment. As indicated in the previous chapter, the researcher used a purposive sampling technique that was based on selecting a specific sample of the population that has knowledge affiliated to the study context. The researcher also employed observations as a data collection method and observed a total of nine midwives during different day shifts. As indicated in Chapter Three (see Section 3.4.2), the researcher used observations to record behaviour, taking notes about what the midwives do in their work environment. The main purpose of the data collection was to obtain information from actual individual midwives during their work practices and to gain knowledge of the study context. During the periods of observation, midwives were interviewed (where convenient and appropriate for them) to clarify aspects that were not clear.

4.3 Theme of Study Context

The researcher used thematic analysis to describe the data collected through semi-structured interviews and observations from the research participants. The data analysis was started with a coding procedure in an inductive approach. The researcher used the inductive thematic process within the stages of the coding process as well as indicated in Chapter Three (see Sections 3.5.1 and 3.5.2). The coding process started with reducing the raw information by writing out the line of each unit of text. The themes of this research study were elaborated into information needs and information seeking behaviour or practices and communication needs of midwives in the antenatal and intrapartum care environment. The researcher divided the study context into themes, then identified the meaning of each theme,

and put them in relevant themes of the subject. The initial themes emerged from the literature analysis and were further crystallised with themes from the empirical data obtained from observations, interviews, and document analysis.

The following themes emerged:

1. Information needs of midwives
2. Information seeking practices of Midwives
3. Midwifery Information Sources
4. Information Providers
5. Communication Practices of Midwives

4.4 Elsies River Midwifery Obstetric Unit

Elsies River MOU (ERMOU) is located in the suburb Elsies River in the Western Cape, South Africa. The ERMOU is an integral part of the public healthcare system in South Africa and plays an essential role in the care of pregnant women, providing care for mothers during various stages of their pregnancy, namely antenatal, intrapartum, and postpartum. Midwives are specialists in providing professional healthcare services during normal pregnancy and birth. They also look after pregnant women and their babies throughout the antenatal period, during labour and birth. In the ERMOU midwives have the responsibility and accountability to detect any complication in mother and child during and after birth. Pregnant women are also attended by the ERMOU when they become pregnant and they stay in touch with a midwife at the different stages of the pregnancy: antenatal, intrapartum, and postpartum. The midwives assist pregnant women in the ERMOU and answer all their questions and monitor the condition of each individual pregnant woman during the different stages.

The ERMOU provides healthcare services as a community health centre to the Elsies River community. The midwives deal with healthy pregnancy, low risk pregnancy, and normal births under normal circumstances. Karl Bremer Hospital is a first level referral institution which provides additional healthcare services. Tygerberg Hospital is a level three institution where specialised healthcare services and support are provided (see Glossary of Terminology describing level of hospitals). In the ERMOU midwives work with doctors based at the levels 2 and 3 hospitals. In Karl Bremer and Tygerberg hospitals there are doctors who specialised in pregnancy and childbirth. Both of these hospitals provide additional support and guidance to midwives in order to manage patient circumstances. In MOUs midwife teams work closely together with doctors from both hospitals who can provide additional

healthcare services and offer support if necessary. Midwives ensure the safe delivery of the baby by the mother in work environment of the ERMOU.

The midwives working In the ERMOU are required to register with the South African Nursing Council (SANC). Registration is compulsory for midwives to practice as a healthcare professional. Midwives are an important source of support; information, and advice in the ERMOU. If complications occur they refer patients to doctors to deal with specific situations. In the ERMOU midwives refer patients to the Karl Bremer and Tygerberg hospitals when the patients' condition requires advanced or specialised healthcare to ensure the protection of the babies and pregnant women. Furthermore, midwives handle the information relating to the mother and baby as part of their work practices, recording and updating patients' information in the maternity case record book. Midwives work both individually and collaboratively with their colleagues and supervisor in order to make appropriate decisions. Also midwives keep up-to-date by reading monthly magazines, books, and articles. Midwives in the ERMOU do not have access to the internet so midwives gain their experience from their work practices and by reading material pertinent to midwifery practice from other sources.

4.5 Information Needs of Midwives in the ERMOU

Information is needed for midwives to perform their core tasks and is a concern of the midwifery practice in the ERMOU. Midwives obtain information from a variety of sources that satisfy the goals and tasks of their work environment. The handling of information in tasks and activities is based on the need of midwives for their work practices as well. Midwives also have different information needs depending on their functions and responsibilities. Information is required by midwives to deal with specific situations such as diagnosis and the solution of specific problems related to their work at the midwifery obstetric unit. Indeed, midwives integrate information from a vast variety of sources throughout the MOU, to provide midwifery care and safety care of patients during their work practices. The research specifically explored the information needs of midwives during the antenatal and intrapartum stages of the healthcare services.

In the research interviews the midwives indicated that information is important and needed during their work practices. In the ERMOU midwives work in a partnership with women as their patients during pregnancy, after childbirth, and also during the care of the new-born. Midwives have experience and knowledge as a result of their studies and also from their work activities in practice. Therefore, midwives require the information gathered from a

variety of sources during the antenatal and intrapartum care to conduct the practice and to make appropriate decisions. For instance, midwives use information from the maternity case record (MCR) book. The MCR book contains the patients' recorded information, their treatments, and details of the stages of care such as antenatal, intrapartum, and postpartum. It also contains the patients' progress. This is the main source of information for the midwives' need to know who the patients are, to understand the culture of the patients, and additional information that enable midwives to better manage patients in the ERMOU.
Below are examples from the MCR of patients as used by the ERMOU.

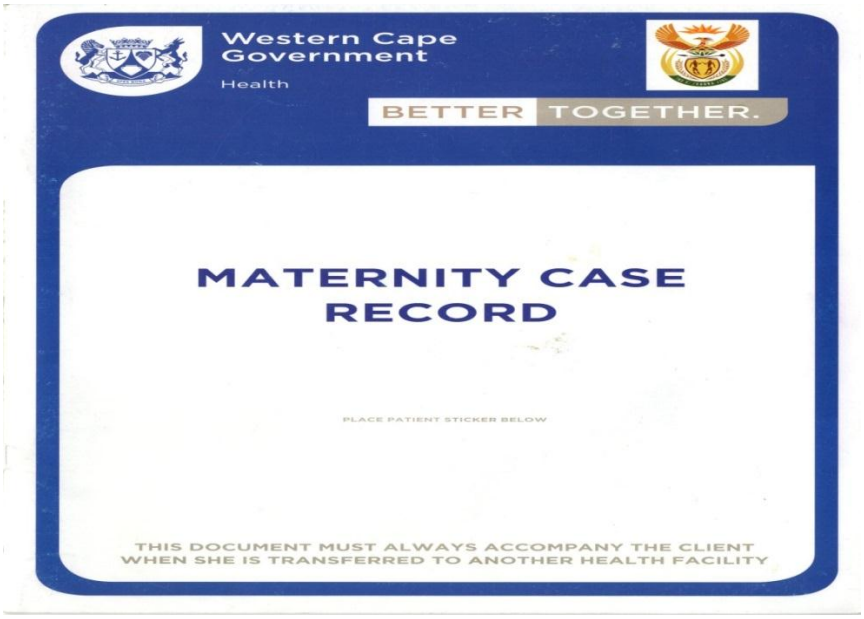


Figure 4.3: Maternity Case Record Book

(Adapted from Western Cape Government - Health)

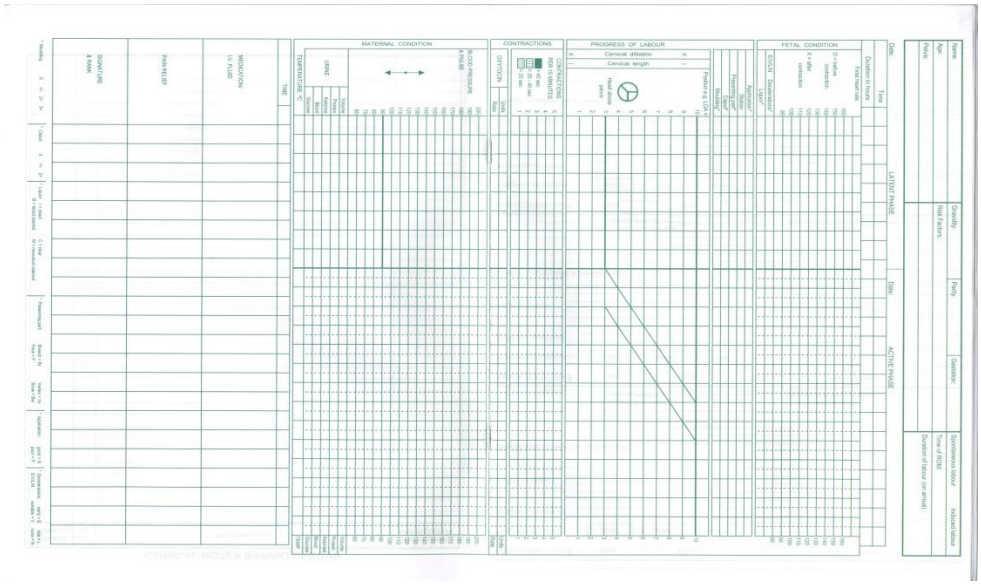
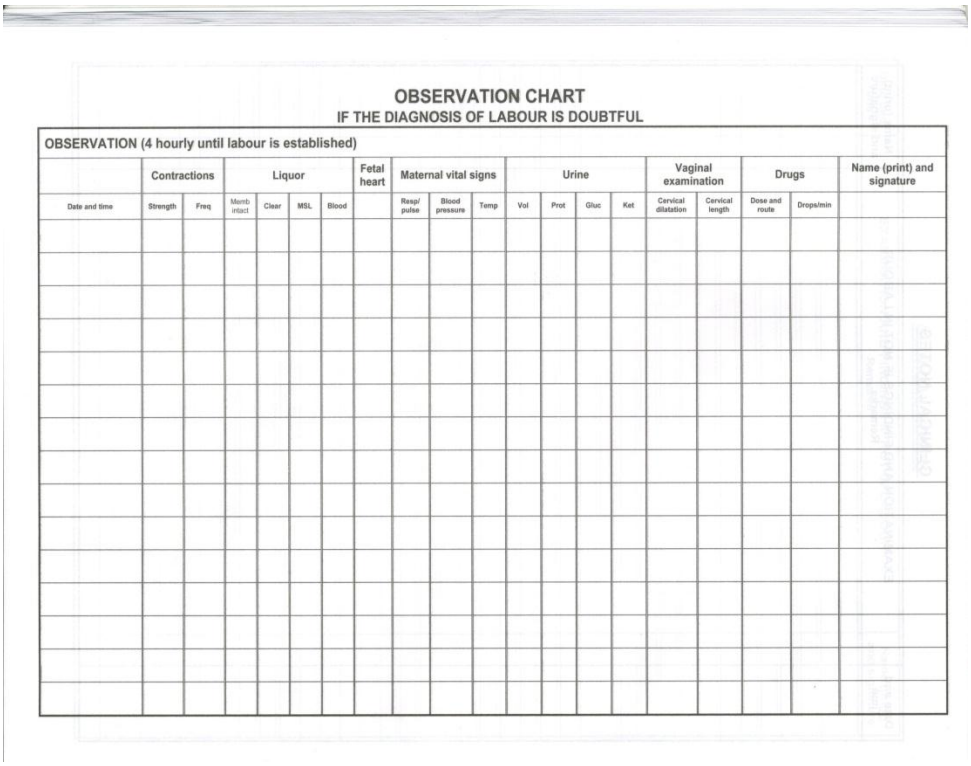


Figure 4.4: Maternal condition and progress of labour used during pregnancy and labour

(Adapted from Western Cape Government - Health)



OBSERVATION CHART

IF THE DIAGNOSIS OF LABOUR IS DOUBTFUL

OBSERVATION (4 hourly until labour is established)

	Contractions		Liquor				Fetal heart	Maternal vital signs			Urine				Vaginal examination		Drugs		Name (print) and signature
Date and time	Strength	Freq	Membr intact	Clear	MSL	Blood		Resp/ pulse	Blood pressure	Temp	Vol	Prot	Gluc	Ket	Cervical dilatation	Cervical length	Dose and route	Drops/min	

Figure 4.5: Observation chart (if the diagnosis of labour is doubtful)

(Adapted from Western Cape Government - Health)

The midwives indicated that the MCR is an essential source of information which describes patient's details and care progress (see Figures 4.3, 4.4, 4.5). Midwives deal with several activities that occur during their work practices. It is important for midwives to obtain and provide information on time to perform their tasks. Therefore, when a complication arises or in an emergency circumstance, midwives urgently need information to deal with that specific situation and they may also use guidelines in this case, to provide safe care of mothers and babies (see Figure 4.6). Sometimes midwives need to phone a doctor if they do not know "what to do" or if they have to refer the patients to the hospital as soon as possible, in order to ensure the safe care of mother and baby. A midwife does not have time in such a case to go and search for the information in a book or to consult other printed documents in their work practice environment.

Midwives rarely need information from a text book or literature about maternal healthcare services during their work practices due to the lack of time. They have to provide services to many patients and often need information immediately in an emergency situation. The most general information needs are related to patients and they can get the information from the patients or by asking questions to the relatives of the patients. Further, midwives obtain information needed from the patient's maternity case record book, midwifery BANC Protocol, maternity care guidelines (see Figures 4.6 and 4.7), and also from their colleagues. In addition, midwives work collaboratively via telephone with a doctor in order to manage the patient's situation and to make the appropriate decision. Moreover, midwives sometimes cannot access information when the patient does not have a maternity case record book or the patient does not speak the same language as the midwife. For instance, if the patient does not have a maternity case record book the midwife communicates verbally with patients to obtain the information that they need and then the patient becomes the source of the information. Essentially, when the patients answer the midwives' questions, all of these answers are critical information and count as a source of information. Midwives can then deal with the situation to make appropriate decisions in the work practice environment in the ERMOU.

Midwives keep up to date by reading journal articles, nursing magazines, and a midwifery text book as indicated by them. Also midwives subscribe to the DENOSA magazine (see Abbreviation and Glossary of Terminology) based on obstetrics called Nursing Update South Africa (see Glossary of Terminology). In the ERMOU midwives have a programme, namely an In Services Programme which demonstrates the development of midwives' capability and update midwives' knowledge. The In Services Programme occurs once every three months and the programme is run by the midwife supervisor at ERMOU. The midwife supervisor

prepares a list of topics that encompasses different cases of midwifery and each midwife has to present one topic. The benefit of this programme is to enhance the midwives' capabilities, for them to learn more about these topics, and also to learn from each other. The purpose of this programme is to keep midwives up to date with knowledge, work practice experience, and to learn more about how to manage patients' information needs.

Furthermore, a group of midwives from the ERMOU usually attend quarterly or experimental meetings occurring every three months at the Tygerberg Hospital — sometimes called an antenatal meeting. Normally these meetings are discussions of interesting cases and how the cases were managed. Moreover, a group of doctors from Tygerberg and Karl Bremer Hospitals visit the ERMOU and present cases related to the midwifery practices and describe how they can manage different types of cases. The main purpose is that midwives can obtain knowledge and experience and keep up to date with related additional information. The study found that most midwives' work is advanced with up to date management information.

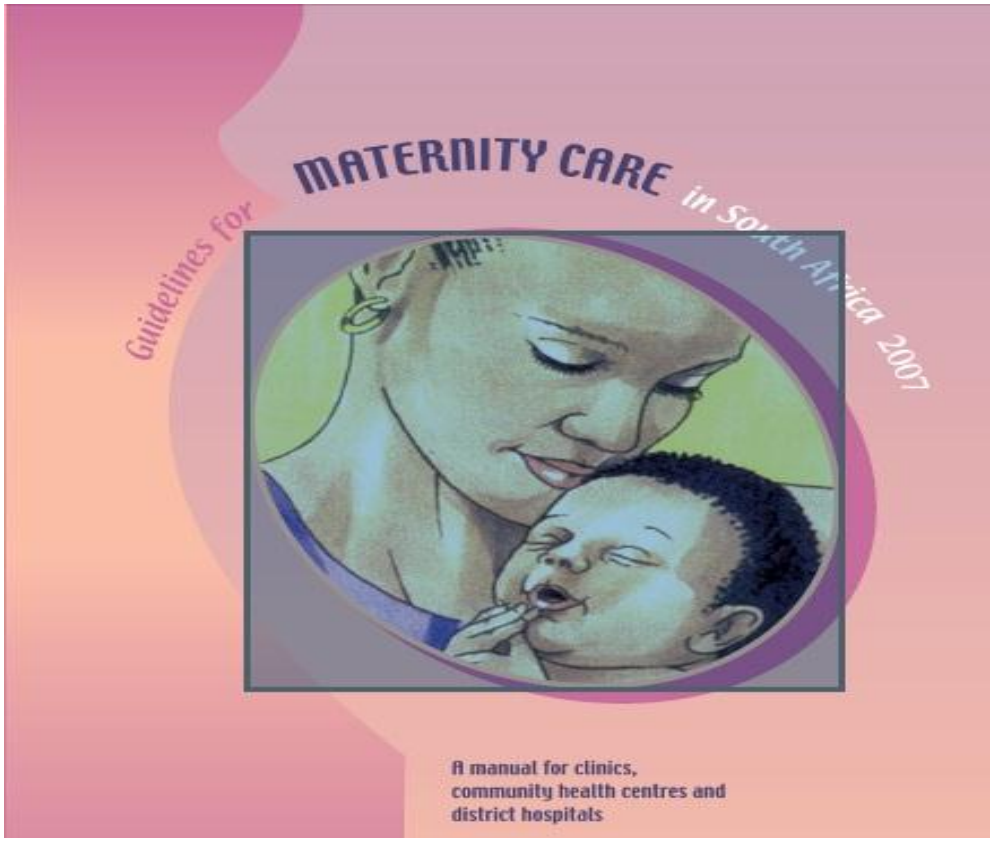


Figure 4.6: Midwifery Guidelines for Maternity Care

(Adapted from Department of Health [HOD], 2007)

Below are excerpts from the interviews to illustrate the information needs discussed above of the ERMOU midwives.

Figure 4.7: Midwifery BANC protocol

(Adapted from Western Cape Government – Health, 2012)

Researcher: *what kind of information do you need before you start to prepare for work your practice or during your work practice?*

Interviewee: *"a lot of the theoretical information that I require is information that already have due to my studies and my experiences. However, when we start to work what is very important for me is that I need to know who the patients are so that the day I can prepare myself and I say I have got the patients and I will know how to manage them."*

Researcher: *also if you can discuss the information when the patients come to the MOU and if you do not have history record about patients, how you are going to get the information that you need?*

Interviewee: *"most our patients that are coming to the labour ward or intrapartum they have already attended the antenatal clinic so if they attend antenatal clinic they have got what we have on the maternity health record. So the maternity case record then gives us all the information we require about these patients. The types of information*

they officially give you are the name and surname of the patients and the age and how many babies she had before; if yes, how many pregnancies she had before and how many babies at the best pregnancy? Because it could happen at the time that the baby died for whatever reason, also if they are going to tell us if the baies have died why they died. Also they give us their medical history of any illness. Other things today as well is physically for us we will know the weight of the patients, and we will know when the physical examination was and when she did come for the first time and that if there are any problems there. And we will also be able to determine from that how pregnant she was when she came to clinic and whether she had any problem when she came to clinic and the other things that we use are the blood result and all the cases and how she has been attending the clinic. All the information we get from the maternity case record, if there is anything that we do not know we can ask the patients themselves but that is the only way we get the information from the patients or from maternity case record there is no other system with the information about patients"

Researcher: *If the women came to the MOU and she needs to deliver a baby but she does not have a history record in such a situation what will happen?*

Interviewee: *"that patients that comes they do not attend clinic or she does not have book with her we must ask the patients for all the information and what we will do is we will do all blood tests that you have to do everything and you have to ask her, if there is no place where the information is stored or captured, you have to do it over again. If she doesn't have book, you have to do everything over again".*

Researcher: *What do you think about this information as you are a midwife? Is it critical information?*

Interviewee: *"It is critical information and it is very critical because in midwifery every problems that patients have, can have a bad effect on patients so I need to have all the information so that I can ensure the mother and the baby are well, it is very critical".*

The Information needs of midwives findings indicate that:

- Information is an integral part of the midwives' work practices since they capture details and use previously recorded information about the patients they treat. Patient information appears in the maternity case record book
- Midwives need information to guide their work practices, e,g. maternal guidelines, protocols, etc.
- Midwives need to integrate patient information based on the patient observations and treatment with information from information sources such as guidelines and protocols

and in the case of complications also information provided by doctors in referral hospitals

4.6 Information Seeking Practice of Midwives

The information seeking behaviours or practices of midwives are the interactions of obtaining information from existing resources such as midwives' colleagues and the maternity case record book. The information seeking practice of midwives began with information needs of information and is followed by filtration of the information to the work practice. In the ERMOU midwives seek information from a variety of sources that they interact with such as a maternity case record book which is the main source of information. Therefore, when midwives seek information they ask patients questions regarding their pregnancy and treatment. Midwives have several activities that occur with patients and sometimes midwives seek information on the specific patients' problem to make an informed decision. Information seeking practices of midwives are based on the provision of safe and quality care for patients in the antenatal and intrapartum care environment. Thus, it should satisfy the real and significant healthcare services in the ERMOU.

Midwives work and seek information as individuals or as a group / team in the ERMOU. Midwives collaborate when they seek information regarding the diagnosis and treatment of patients in order to provide effective patient care in the ERMOU. The midwives indicated that it is an essential task for midwives during their work activities to communicate with each other when they start seeking specific information. Furthermore, midwives communicate with each other to provide care or to make decisions. Midwives seek information from the doctor by phoning them at the Karl Bremer or Tygerberg hospitals when they feel unsure about a patient's case management during their work practices. In some cases midwives seek information from midwifery guidelines to ensure the safe care of patients. In general the researcher asked participants where did they seek information from and the participants answered that "information is mostly taken from the maternity case record book and by asking patients questions". Also the midwives' team work is to collaboratively retrieve and use information from different sources, including midwives' experience and knowledge to solve problems or to make a decision. In the ERMOU midwives seek different pieces of patient information that are located in different sources and resources. For instance, midwives use ultrasound results from external facilities to estimate the period of pregnancy and the date of delivery, baby size, and to check if the baby is growing normally and to detect any abnormalities with the pregnancy. As mentioned, the midwife team seeks this information effectively when needed to treat patients or to make appropriate decisions. The

information seeking practices of midwives during the antenatal and intrapartum care employ significant tasks and midwives are concerned about the care of the mother and baby.

Below are excerpts from the interviews with the midwives from ERMOU with regards to their information seeking behaviour.

> ***Researcher:*** *How do you seek or find the information you need?*
>
> ***Interviewee:*** *"It is only by asking the patients or doing by ourselves. We cannot do it by anywhere else because we do not have computer system and where the information is captured, we do not have".*
>
> ***Researcher:*** *When do you seek the information during your work practices?*
>
> ***Interviewee****:Most of the time the patient's information is needed only when the patient is admitted for the first time when they come in then I need that information. For example, maybe if I am taken over from another shift I have not been working and only coming on duty she will hand over all that information to me before they go off".*
>
> ***Researcher:*** *Do you seek this information always or sometimes? For which situation do you search for this information?*
>
> ***Interviewee:*** *"You see, the information is already there, remember maternity case records have all the information on the maternity case record so when I am working with patients I only need to look one time. I do not need to look again because I already went through it so I know that information now, I do not have to look at it again".*
>
> ***Researcher:*** *Where do you find information if you are not sure about a patient?*
>
> ***Interviewee:*** *"If I am not sure I would ask my colleagues and if they are not sure then we will go to the protocol book. Also we will phone the doctor and just tell him we do not want to send a patient but just give me your advice because we are not sure what to do now and they will help us."*

The findings relating to the midwives' information seeking practices are:

- They obtain information from various sources often located at different locations; integrate the information with their work practices and share information with colleagues
- They often work as teams with collaborative information practices resulting in information exchanges and sharing
- They have to share information about the patients' conditions with doctors at the hospitals at different locations where the doctors have to rely on the information

provided by the midwives to advise them on dealing with the patients' conditions without actually seeing the patients.

4.7 Midwifery Information sources

An information source is knowledge of individuals or previously captured information and can be provided or used by healthcare professionals (midwives and doctors) in the healthcare facilities. For instance, midwives deal with a variety of information sources such as a maternity case record book, BANC protocol, midwifery maternity care guidelines, midwives' knowledge and experience. These information sources play an important role in providing information for midwives during work practice in the ERMOU. Therefore, midwives as individuals or teams seek information from a variety of sources to obtain and utilize information during their work practices. In the ERMOU information sources are essential for supporting midwife teams, typically in collaborative information seeking activities. The midwives' team communicate with each other for providing and using information and also midwives have access to other sources of information — for instance, healthcare specialists at Tygerberg and Karl Bremer Hospitals. These sources of information are critical in providing information that is necessary to accomplish a particular task in the ERMOU.

The findings relating to information sources are:

- Information sources are still only paper-based
- midwives use data from diverse different sources that include the details of the patients previously recorded in the maternity case record book; lab results; additional information from guidelines, protocols and relevant literature; colleagues; and specialists and doctors from the hospitals.

4.8 Information Provider

An information provider is someone who produces information that could be useful to others. In the case of this study midwives during their work practices in the ERMOU also provide information as part of their information practices. Also the department of health plays a significant role in providing information and material related to midwives such as the midwifery BANC Protocol; guidelines for maternity care; and the obstetric magazine called Nursing Update South Africa. Midwives provide information as part of their decision making about their care activities during their work practices. In the ERMOU, midwives provide information related to diagnosis treatment or the information delivery process. Therefore, information delivery is a core function of midwives in their daily work activities. Midwives also provide information through their recording of patients' performance progress in each stage. Midwives at ERMOU do not currently have electronic systems that can supply required

information on time. Midwives work manually by writing or recording in the maternity case record book with the provision of specific information in different circumstances. Again midwives work collaboratively with doctors to provide information related to patients' care.

The finding related to information providers is:

- Providers of information for midwives to use during their work practices are:
    - Midwives as information providers when they record the patient and labour process details as well as their decisions in the maternity case record book
    - The Department of Health provides information in the form of protocols and guidelines
    - Doctors provide additional information in the case of patients with complications

4.9 Communication Practice of Midwives in the ERMOU

Communication is a useful manner of sharing and exchanging of information during the midwives' work practices in the ERMOU. Every day midwives communicate with colleagues to provide healthcare services to pregnant women as part of their work practice. In the ERMOU the midwives indicated that communication is very important with colleagues and other health facilities in managing patients' care, solving problems, and for decision making. The midwives indicated that it is essential to stay informed and be informed about their work environments in order to manage the care of their patients effectively. Midwives communication depends on the types of the problem and the situations that occur during their work practices. For instance communication is essential when a patient needs to be transferred to the hospital, which is mostly for high risk situations that arise during intrapartum and postpartum care. Midwives work with doctors to develop a plan to aid in the safe delivery of healthy mother and babies in the ERMOU.

Regarding the patients' conditions in high risk cases, midwives have to communicate urgently with doctors at Karl Bremer or Tygerberg Hospitals using telephones for extra support. In this situation midwives communicate and collaborate with colleagues and doctors from both hospitals as mentioned above to make appropriate decisions about their patients' condition. In addition, midwives share and seek information from the BANC protocol to know what they need to do in that situation. They also seek information from the guidelines to communicate with each other (see Figures 4.8 and 4.9). In the ERMOU, midwives rarely use internet to communicate via email or Skype with other facilities to solve potential problems. Furthermore, a midwife does not have access to the library resources or internet to search and read about a particular problem in the MOU. Midwives use a telephone as a

communication medium to phone the ambulance for transfer of patients to the hospital for additional care and support.

Importantly, after midwives have referred the patients to the hospital, either Tygerberg or Karl Bremer, they can sometimes not get hold of the doctor while they need urgent assistance from the doctor to make a quick decision. Similarly, midwives face difficulties to communicate with doctors from external facilities or outside the MOU. Therefore, often a doctor is not available to advise midwives on how to treat the patients and to make appropriate decisions at the right time in that situation.. Midwives' communication needs are inadequately addressed because timely information is necessary to perform their role effectively and appropriately. Their communication needs require a detailed understanding of the setting and context in which patients are cared for, providing professional quality and safe healthcare. The midwives indicated that, there was a strong relationship and effective communication between the ERMOU and both Tygerberg and Karl Bremer hospitals. However, when midwives received high risk patients while they strove for the best care and support, the communication problems they experience make it difficult for them to perform an effective healthcare service.

In this sense, midwives work as partners in providing care to their patients and they share decision making with midwives' teams and doctors in providing their care in the ERMOU. Midwives work as an integrated team communicating with each other during the various antenatal, intrapartum, and postpartum phases. Equally important, midwives communicate with each other during the handover process and as an essential step the midwife team of the previous day shift communicate with their colleagues of the new day shift. They communicate effectively with each other face-to-face during the handover. Furthermore, the midwives' handover occurs at the patient's bedside, while discussing the patients' circumstances. Midwives of the new day shift introduce themselves to the patients when they start their work for a new day shift making conversation with the patients to ensure that the they feel comfortable as part of the continuous care of the patients. Midwives especially perform necessary medical examinations throughout the pregnancy, the intrapartum stage, and delivery of babies. Midwives provide emotional and practical support during the antenatal and intrapartum care. However, handover healthcare is essential for the continuity of care in the MOU as part of the midwives' work practices.

Midwives have a variety of communication channels that they use during their work practices. Midwives communicate face-to-face, and during handover and also communicate effectively with doctors from Tygerberg and Karl Bremer Hospitals via telephone (see Table

4.1). Furthermore, midwives communicate with patients daily and spend a lot of time with patients to give advice and support about their health and cooperation.

Below is a summary of the communication types and channels used at ERMOU during the healthcare services.

Table 4.1: Types and channels of communication used throughout in the ERMOU

Communication Types	**Communication Channels**
Direct communication	Verbal information exchange
	Telephonic communication
	Meetings
	Non-verbal communication
Practice regulation	BANC protocol `
	Care Guidelines
	Day shift change
	BANC protocol `
Mass Media	Magazine
	Journal
Education	Informal training

In Figures 4.8 and 4.9 are examples of the guideline as an example of a communication channel to make information available to the midwives.

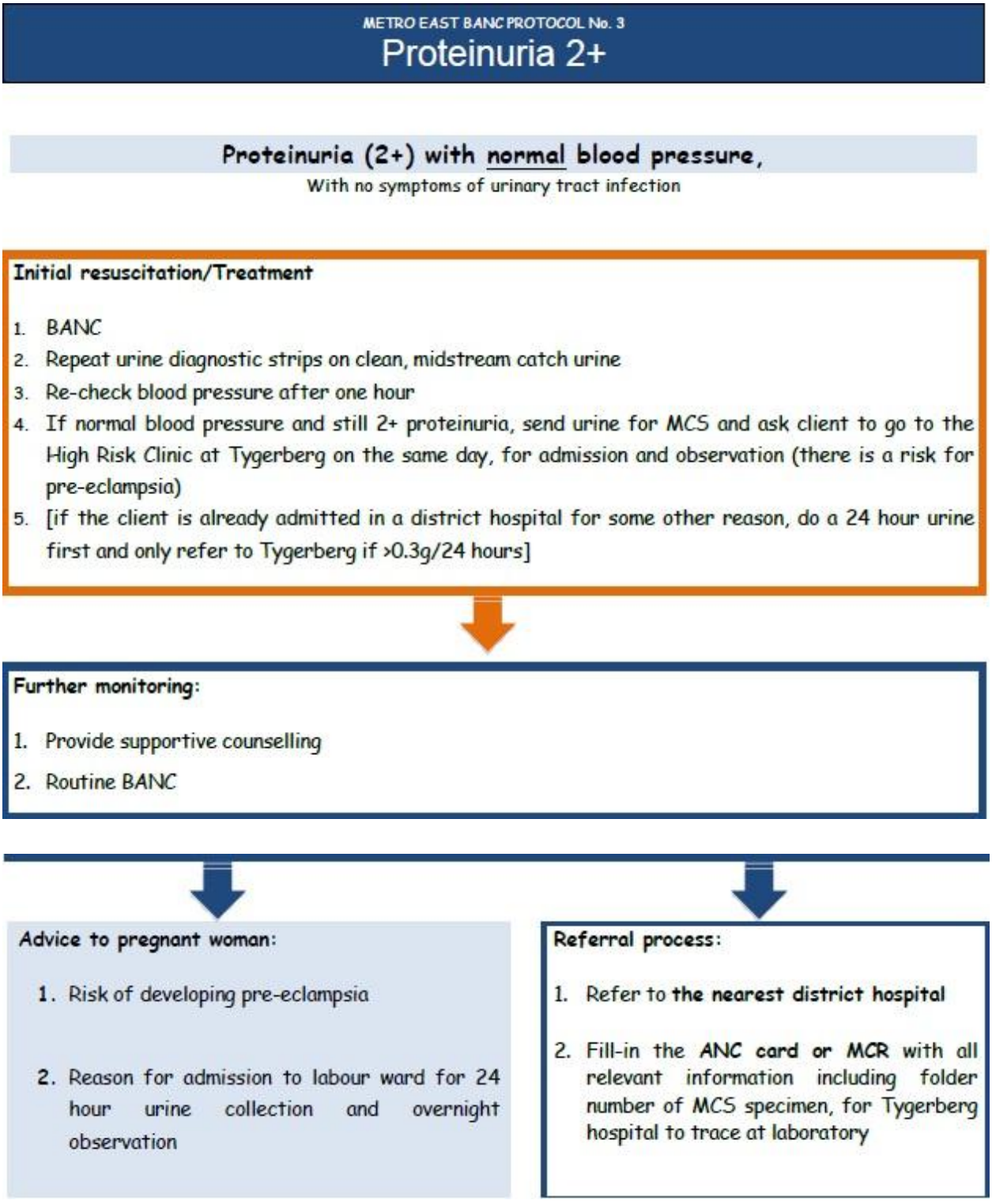


Figure 4.8: Midwives seek and use information need from guidelines

(Adapted from Western Cape Government – Health, 2012:5)

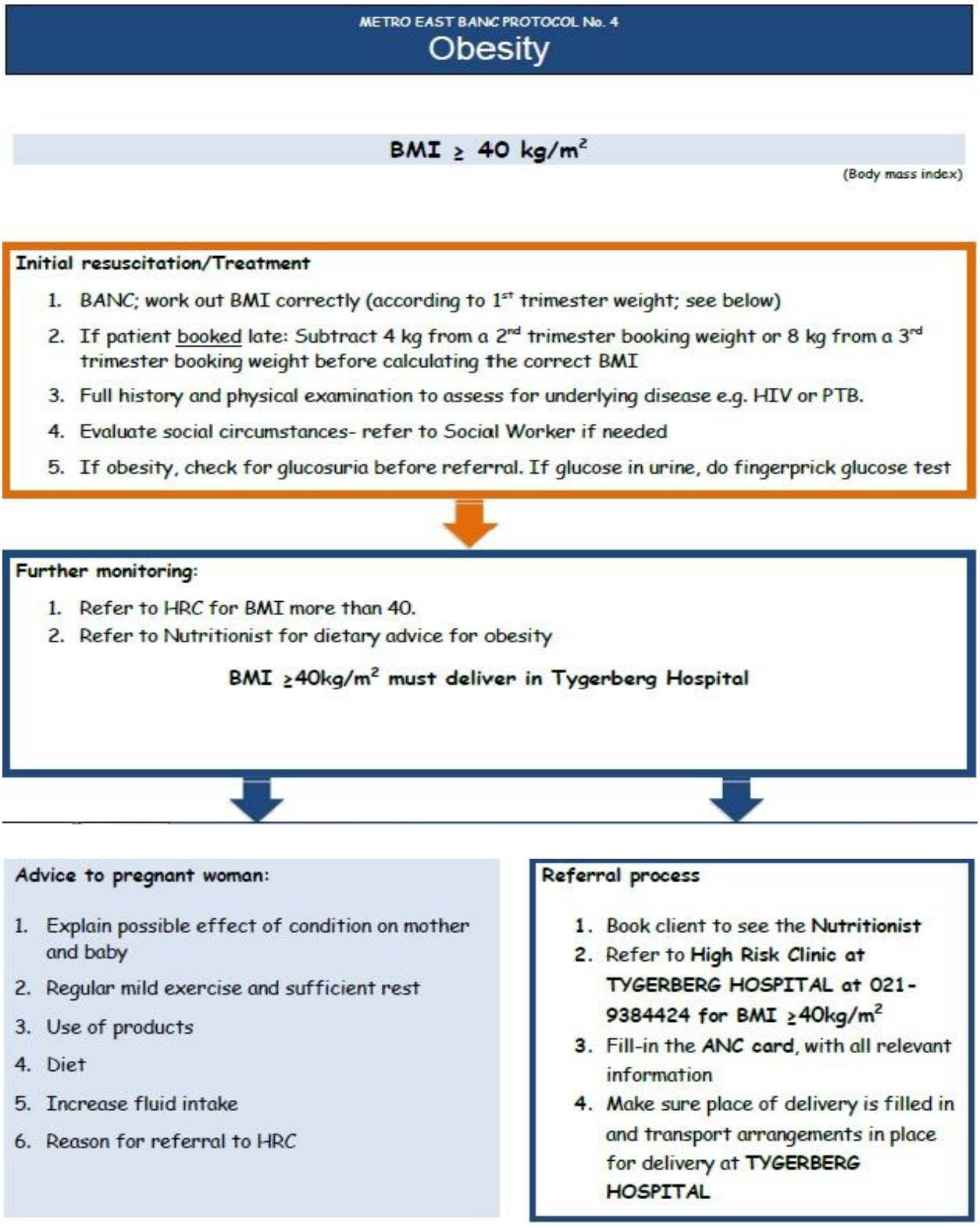


Figure 4.9: Midwives seek and use information need from guidelines

(Adapted from Western Cape Government – Health, 2012:6)

Below are excerpts of the interviews to illustrate the communication behaviour of midwives. The many issues were posed as individual questions but are indicated together below.

***Researcher**: So my main focus is to establish your communications with your colleagues and patients when managing the patient care, especially during handovers. How do you observe the patient, how do you record that information or how do you communicate that information to another midwife and then if you need to handover, how do you do it or if you need to go for tea, how do you do it? How do you go through your day communicating information about patients from when the patients comes in and they are being managed in first stage, second stage through to fourth stage? If there is an emergency – that this patient needs to be transferred, how do you communicate the information about this – what have you been doing about this patient to the person who is on the other side? Whether you consulting about the management or whether asking for guidelines regarding the referral? How do you communicate and how do they give you feedback?*

***Interviewee A:** "when we come in for our handover – if I am working the day shift – we have to do a handover. We go from bed to bed we discuss in detail if it's a post-partum patient, what has happened from when she came in through the labour, if there were any difficulties, focus on that, and when they have leave you take over the patient and you go on. You introduce yourself to the patient, you go on from where they left off because it is an on-going service. There are patients coming in – antenatal patients. We admit them, we do the observations. If we find a problem we discuss it with the doctor. If it's something that we can sort out here, we sort the patient out. If for instance the patient comes in for one thing then it's another problem that pops up so then we focus on that. So we keep the patient informed – well that's what I do – and we let the patient know what's going to happen, you see. Sometimes there are patients from the antenatal clinic that have a problem there and it needs to be sorted out in the labour ward, we do that. If the patient needs to be transferred we talk to the doctor, we book the ambulance if they don't have their own transport and the criteria is that they need to go in an ambulance, then they go. We find out somehow if the patient needs to go according to the problem that they have, according to protocol, when the patient gets there, later that day when we have time, we follow up on that patient to see what is going to happen, what is the severity of the problem- is there a problem and how will it be sorted – and that is our day"*

***Researcher:** you say that if you come in and there is a problem you ask the doctor, how do you communicate with the doctor. Is it the doctor in the MOU or where?*

***Interviewee A:** "no we don't have doctors in the MOU, we phone according, to say we have our whole criteria on where the patient needs to go, depending on the problem. Say if we find that the patient needs to go to Karl Bremer or to*

Tygerberg – which is mostly for the high risk people. I consider level I as an intermediate which means the patient can be seen there and here. Then we discuss it with the doctor but we know already what kind of problem goes where. But then there are cases when the hospitals are full – say the patient needs to go to Karl Bremer but Karl Bremer is over – full then we need to discuss that with the doctor at Tygerberg and the doctor will then phone Karl Bremer's doctor to confirm if the Karl Bremer really full and why they can't take the patient. He will then phone us back to say ok you can send the patient that side"

Researcher: *let's say – if there is an emergency – what do you do when a doctor is not available because he is busy with a delivery?*

Interviewee A: *"Then I really just phone the ambulance and send that patient and just write in the notes that the doctor was scrubbed up – this is the doctor's name and I did try his phone but no response, and that I know the patient needs to go. We don't wait"*

Researcher: *while you are managing the patient here, how do you go about using information to communicate – how do you ensure that all the information collected is recorded on the relevant patient records – what do you do?*

Interviewee A: *"well normally there are two sisters. I manage the patient, I put up the drip, the catheter, I do all the observations check out the problem and then I will give the information verbally. I will say this and that, these are the observations, I did this – I put up the drip on what arm, what kind of drip it is and she will then phone the doctor. But if I am alone I need to gather my own information and write it down in the patients' notes as a patient has left."*

Researcher: *because we have spoken about when you call a level 2 hospital – how do you find there are problems with communication? How do you think we would improve on that?*

Interviewee A: *"(Laughs) difficult to think now I think when you phone the person you contact initially and says that the doctor is not available, there should be somebody else to be able to make that decision besides the consultant or the doctor that needs to take on that you know there is effective communication, one who understands why this patient needs to be there"*

Researcher: *what documents do you use during the management of intrapartum patients in the MOU?*

Interviewee A: *"we have got maternity case records and there is still the partogram admission notes. That book is actually nice because it has all the papers that you need. When the patient is discharged we have got our own*

partogram- it is still the same as in the book- the green and white notes. We use them, admission notes, we have got a few resources."

Researcher: *Do you think people communicate effectively with each other- the midwives?*

Interviewee A: *"yes"*

Findings specific to the communication of midwives are:

- Information is essential when midwives communicate with their patients, each other, and with doctors
- Midwives work practices are based on their communication with patients, each other, and doctors where information is obtained, provided, shared, exchanged, and recorded.
- Midwives use face-to-face communication with patients and each other and use telephones to communicate with doctors at the hospitals.

4.10 Conclusion

This chapter discussed the interpretation of results and findings of information need and information seeking behaviour or practice of midwives during the antenatal and intrapartum care environment. Furthermore, the communication need of midwives have been indicated as well. The research was obtained and analysed information in anonymity and confidentiality as mentioned in chapter three (see Section 3.6.3). The data was analysed using thematic analysis. The overall quantity and quality of data from this study was sufficient and useable for the research and met the answers of the research questions. Following chapter presents analysis of result and findings of the study context.

Chapter Five: Application of Essomenic Model

5.1 Introduction

The previous chapter presented the ERMOU case and the thematic data analysis of the interviews. Essomenic models are used in this Chapter to reflect further on the data. An essomenic model is based on the processes of stakeholders within a specific environment, in this case the context of a health organisation. The essomenic midwives' journey model demonstrates the midwives' activities and roles in the ERMOU. The researcher used the essomenic model to obtain additional insights into the information and communication practices of midwives as part of their work practices in the ERMOU. The models were developed from the data obtained as part of the case study of information needs and information seeking behaviour or practice in the ERMOU.

In the model the major processes of the midwives' functions were developed through using the data graphics features of Microsoft Visio 2010. Furthermore, all the figures illustrate the midwives' activities and roles during their work practice. In all the diagrams the left side shows patients' movement, staff role, processes, information communication, equipment, and measurement which represent each diagram's function. The essomenic architecture and layer descriptions, discussed in Chapter 3, Sub section 3.5, is repeated here as Figure 5.1 and Table 5.1.

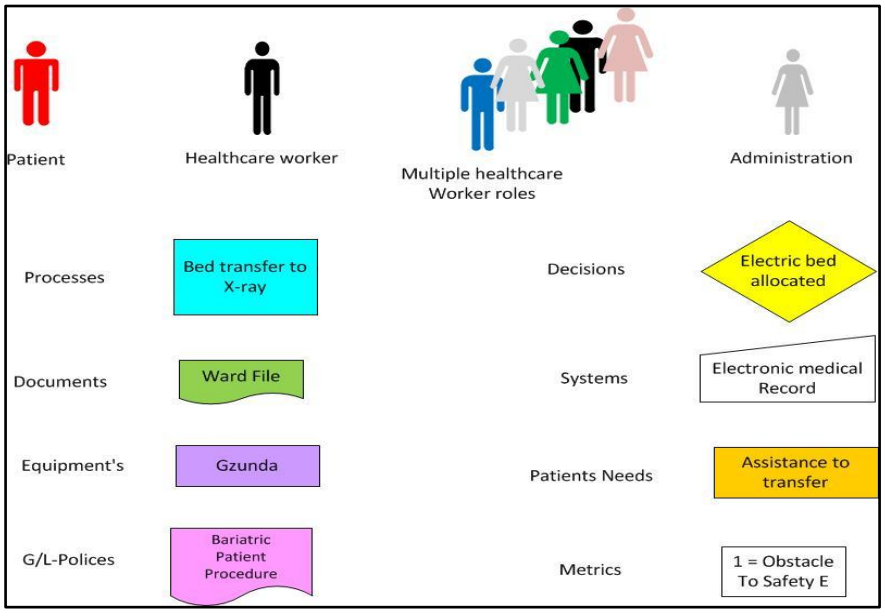


Figure 5.1: Essomenic Architecture

Table 5.1: Essomenic Patient Journey Modelling Layer name and descriptor for the study

Layer Name	Content Description
Patient Movement	Presents when, where and how many times patients are transferred or assisted with treatment during their journey.
Staff Roles	Presents what role of midwives, doctor, nurse student and nurse assistant took place or involved in the journey.
Processes	Names and relates the manual handing processes involved in the journey.
Communication / Information Creation	Presents information communication and flow of information as paperwork to systems that are required by the processes or midwives notes.
Equipment	Presents the equipment used in the process.
Polices / legislation / Strategic objectives	Names the policies / legislation / strategic objectives that must be adhered to during the enactment of the processes.
Metrics	Details the measurements that are used to determine the effectiveness of the stakeholder journey.

(Adapted from Cummins, 2012:13)

5.2 First Antenatal Visit

The first diagram depicts a first antenatal visit (see Figure 5.2). On the left side of the diagram are the layers: a patient's movement, staff roles, processes, information communication and equipment / requirement. All these layers represent the action of each element and the processes or the activities of the ERMOU which begin from left to the right parallel to represent each element from top to bottom. For instance, in the first antenatal visit the process occurs as below:

- Patients arrive at MOU for booking and treatment
- The midwives accept the patient for treatment in the MOU
- Midwife gathers and records the information that is related to the treatment process
- As part of the midwife administration the patient's information is recorded in a Maternity Case Record (MCR) book for each individual patient
- Each patient has a maternity case record book
- A MCR is visible in the information communication diagram which links a midwife process in terms of recording patients' information
- The next step is the diagnosis process such as history taking, vital observation, urine test, blood test and physical examinations. Therefore, in this process midwives treat

the patients and record all patients' information in the MCR. The next appointment is arranged.

- Student midwives participate as part of their in-service learning to learn and gain experience from senior midwives in the MOU
- Equipment consists of chairs, beds which are used by patients during the care process
- The telephone is used by the midwife when communicating with other facilities such as Tygerberg or Karl Bremer hospitals as described in section 5.7
- In the following step if any abnormal circumstances occur with the patients, the midwife consults with doctors from both Tygerberg and Karl Bremer hospitals in order to make an appropriate decision
- Midwives use guidelines and protocols to communicate and deal with a patient's circumstances in order to deliver safe care of patients (see Figures 4.8 and 4.9 in Chapter 4)
- The consultation process addresses the midwives' information and communication needs as well
- Midwives communicate with a doctor to make a critical decision in the MOU
- Midwives refer the patients to the hospital according to the doctor's advice
- If the patient is at a moderate risk, she will be sent to Karl Bremer hospital and if the patient is a high risk, she will be sent to Tygerberg hospital.

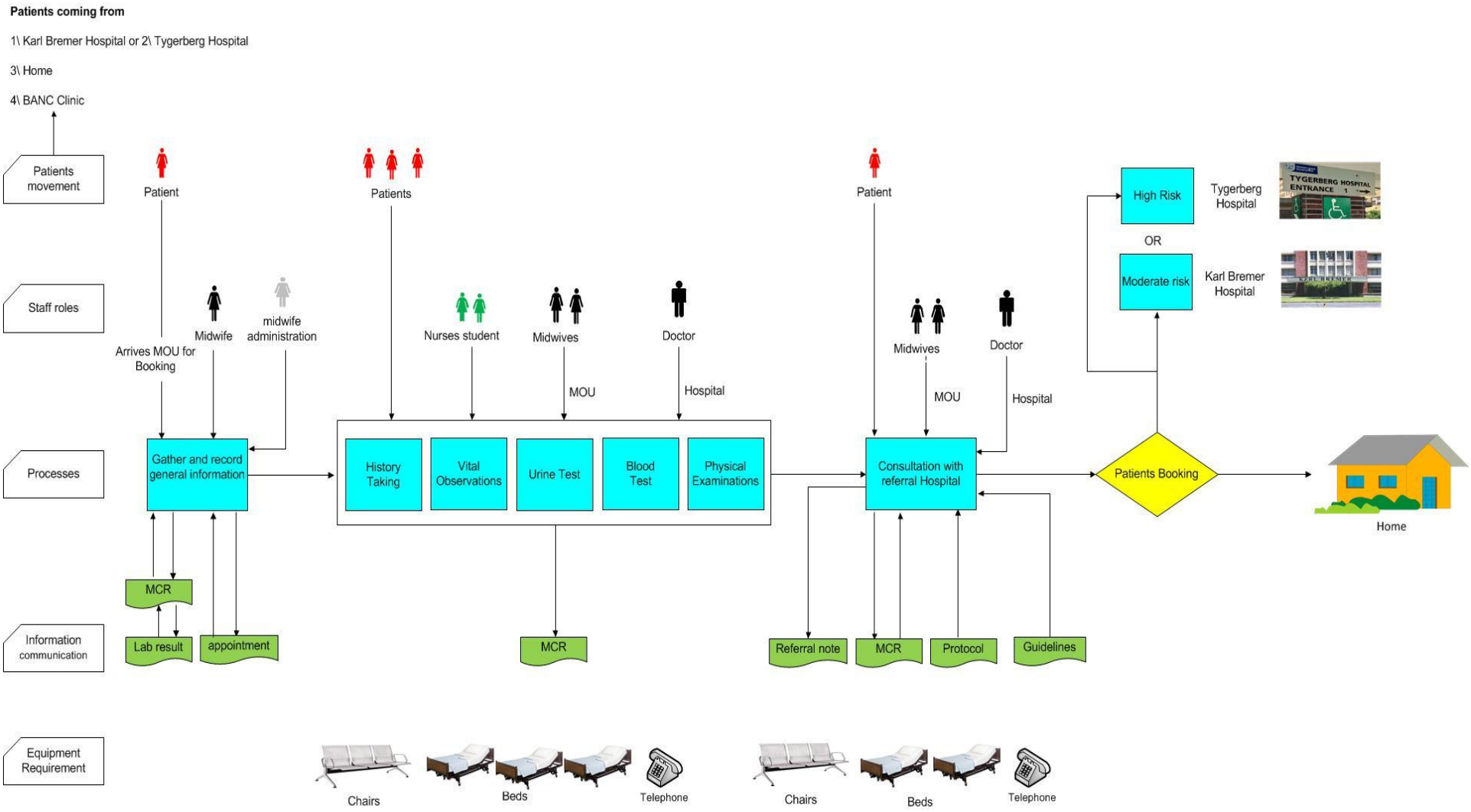


Figure 5.2: First antenatal visit

The findings derived from the essomenic model for the first antenatal visit are:

- All the relevant information of the patient is captured during the first visit when the maternity case record is created
- All the processes require patient information (capturing or consuming) by different healthcare professionals
- The outcome of the visit, to send the patient home or refer the patient to the hospital, is determined based on the information regarding the patient's condition in consultation with guidelines, protocols and if there is a complication, advice provided by doctors at the hospitals.

5.3 Second Antenatal Visit

Refer to Figure 5.3 for the process depicted by the essomenic model for the second antenatal visit. When the patient arrives at MOU for the second antenatal visit the processes occur as below:

- In the processes of retrieving patient's record (second visit): the midwife checks the patient's MCR book and the date of appointment as well
- The midwife also checks the laboratory results from either Tygerberg or Karl Bremer Hospital
- In the second process "contact hospital for patient information" which means the midwife uses the relevant protocol and guidelines to treat patient according to the patient's circumstances
- The patient's circumstances could develop to a moderate or high risk, In such a case the midwife communicates with a doctor from one of the hospitals for extra support
- Routinely midwives communicate and collaborate by phone with a doctor to make a decision regarding the patient's circumstances
- If a midwife fails to solve the problem then she refers the patient to the hospital according to the guidelines
- Again midwives communicate and collaborate with each other in order to manage and deliver safe care of patient
- Student midwives participate to learn and gain experience from senior midwives
- If the treatment is successful the patient is sent home. The midwife discharges the patient from the MOU to go home.

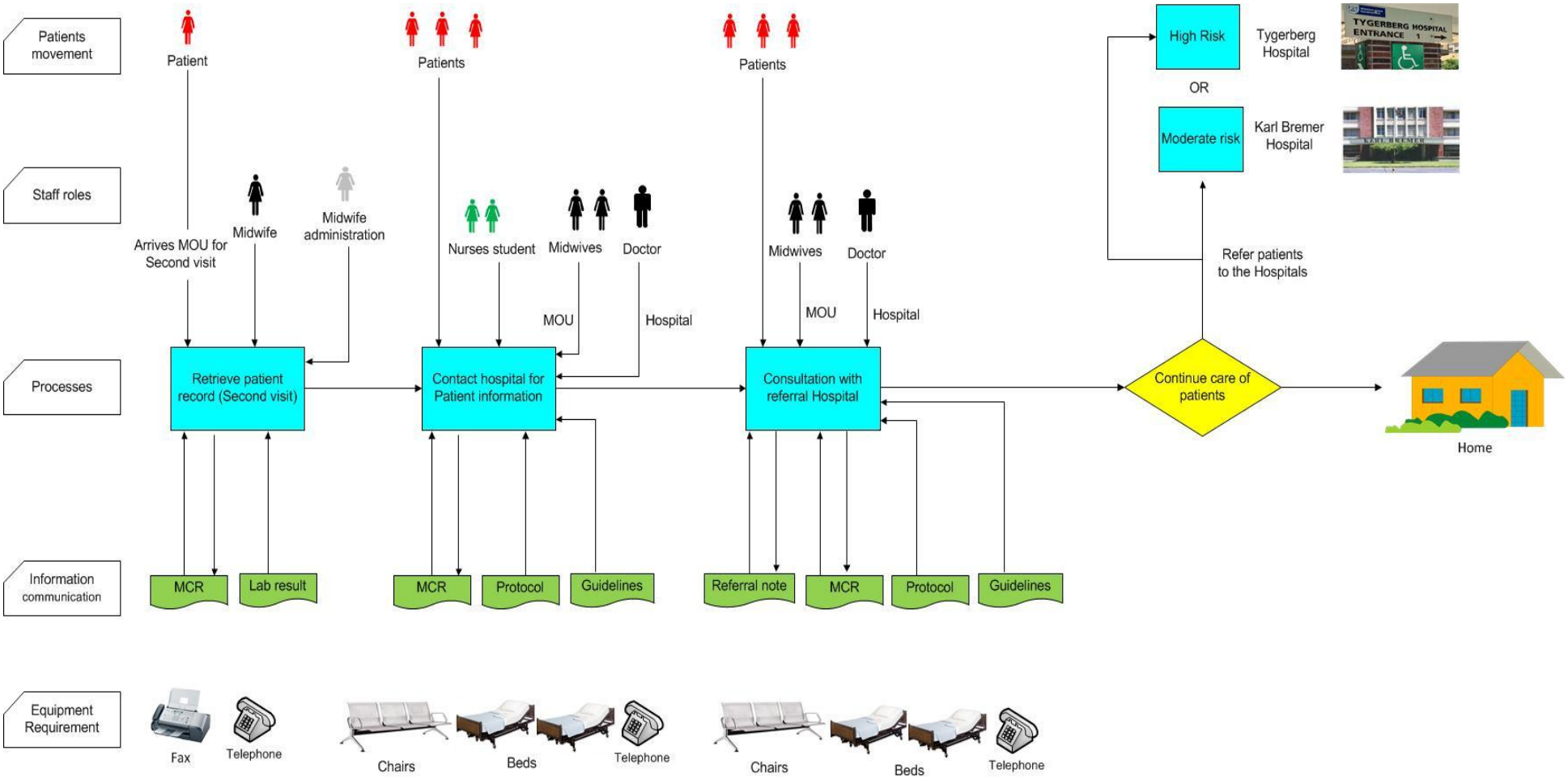


Figure 5.3: Second antenatal visit

The findings based on the essomenic model of the second antenatal visit are the same as for the first visit except that the maternity case record for the patient already exist and is retrieved when the patient arrives at the ERMOU.

5.4 Subsequent Visit

In subsequent visits (refer to Figure 5.4), the same procedures is followed (see Section 5.3). The pregnant women attend or visit MOU regularly until the labour stage occurs which is described in the following section 5.5.

5.5 Intrapartum Care (process of labour)

The labour stage, midwives receive patients in the ERMOU for the delivery process. Alternatively, midwives strive to ensure that safe delivery of mothers and babies during the intrapartum stage has occurred accordingly (see Figure 5.5). Below the labour process and activities follow:

- In the labour stage (see Figure 5.5), the patient has arrived from home to give birth ERMOU
- Midwives assist the patient with advice, physical and emotional support in order for patient to feel comfortable during the birth process
- In the following process (progress of labour, fetal condition and maternal condition), referred to as the diagnosing and is managed by midwives for the various stages of labour
- In this process the midwives team makes sure everything is well prepared and if any complication occurs they communicate with each other to take informed decisions and to resolve problems
- Midwives also refer patient to hospitals for extra support and safe delivery
- If no complications occur during labour then the midwife admits the patient with an advance report about her progress during each stage of labour
- As the researcher described in the diagram, it might be false labour or actual labour
- In case of false labour the midwife sends the patient home but
- If it is a true labour the patients would be in the first stage of labour which is the latent and active phase (refer to the Glossary of Terminology)
- True labour (see Figure 5.6) means established labour or labour in progress to happen
- In latent phase patient will spend about 0 to 8 hours within the diagnosis process
- In active phase patient spends about 6 hours within diagnosis process as well

- For more description of the first stage of labour see Figure 5.5 and Table 5.1

The findings of the essomenic model of the subsequent visit are the same as for the second antenatal visit.

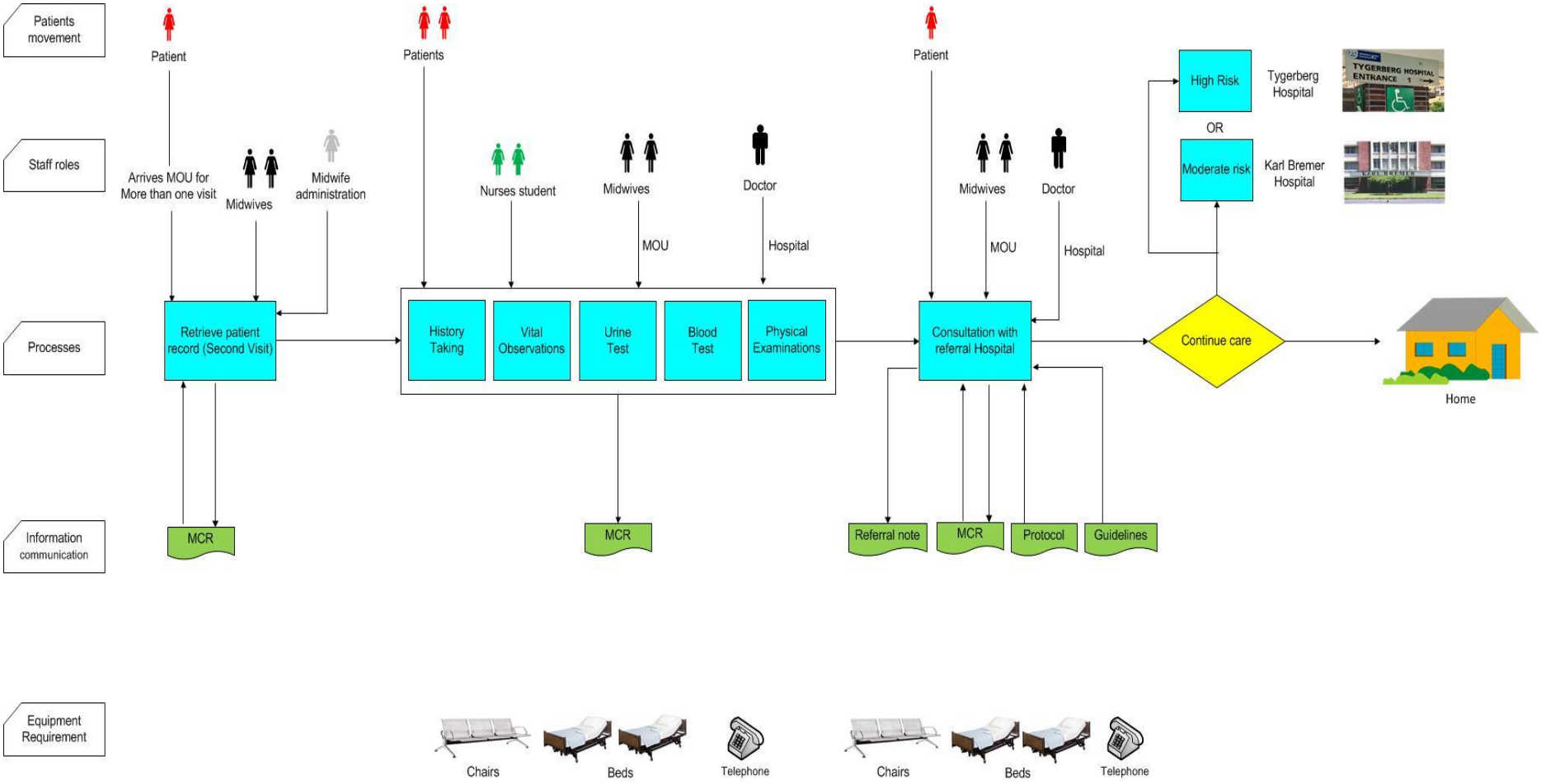


Figure 5.4: Subsequent antenatal visits

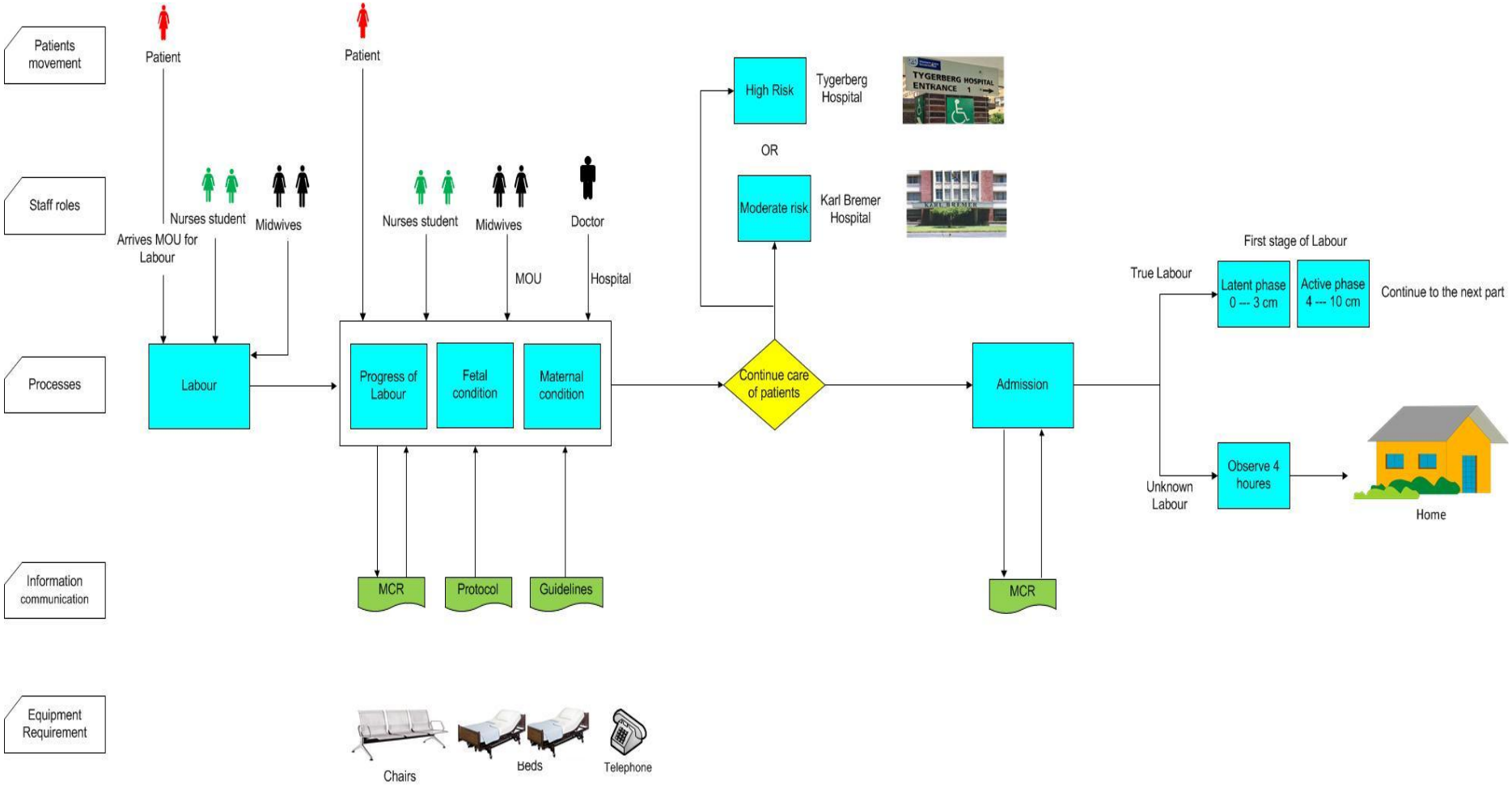


Figure 5.5: Intrapartum care 1 (process of labour)

- Also in both stages if any complication occurs midwives use guidelines and also referral to the hospitals if the patients need emergency care
- After a short period of time the patient will be in a second stage of labour which is a birth (see Figure 5.6: Intrapartum Care 2) and they will spend about 0 to 2 hours being monitored and diagnosed
- If any complication occurs midwives communicate with each other or with a doctor to resolve the problem and also midwives use guidelines to ensure the safe delivery of babies for the mothers
- In the third stage: Placenta (see Glossary of Terminology), it will also take about 15 minutes during the diagnosis process
- In the fourth stage of labour: The mother and baby are observed (see Figure 5.7: Intrapartum Care 3) immediately after the delivery of placenta and this usually takes about 1 hour in order for the woman to be stabilized
- Also midwives record the condition of the patient in the MCR in the observation page (see Figure 4.5 in Chapter 4)
- Midwives use protocol and guidelines to manage the circumstances of the patients during the fourth stage of labour
- If any complications occur during the fourth stage, midwives refer patients to the hospitals for extra support and safe care
- In the last stage of care, after the baby has been born as illustrated in the diagram the patients spend about 6 hours which is a postnatal stage
- If any complication occurs during the postnatal period midwives usually refer patients to the hospital for extra support
- If the patient is a high risk, midwives refer patients to the Tygerberg hospital or
- If the patients in a moderate risk refer them to Karl Bremer Hospital
- If there are no complications midwives send the patient home
- In the intrapartum care, it is very necessary for midwives during these various stages to record the patient's information in the MCR.

The findings of the essomenic model of the first intrapartum care phase are:

- The patient's information is retrieved from the maternity case record and the protocol and guidelines to determine the state of the patient to either refer or admit the patient.
- The information relating to the labour process is continuously recorded and considered by the midwives to decide what to do.

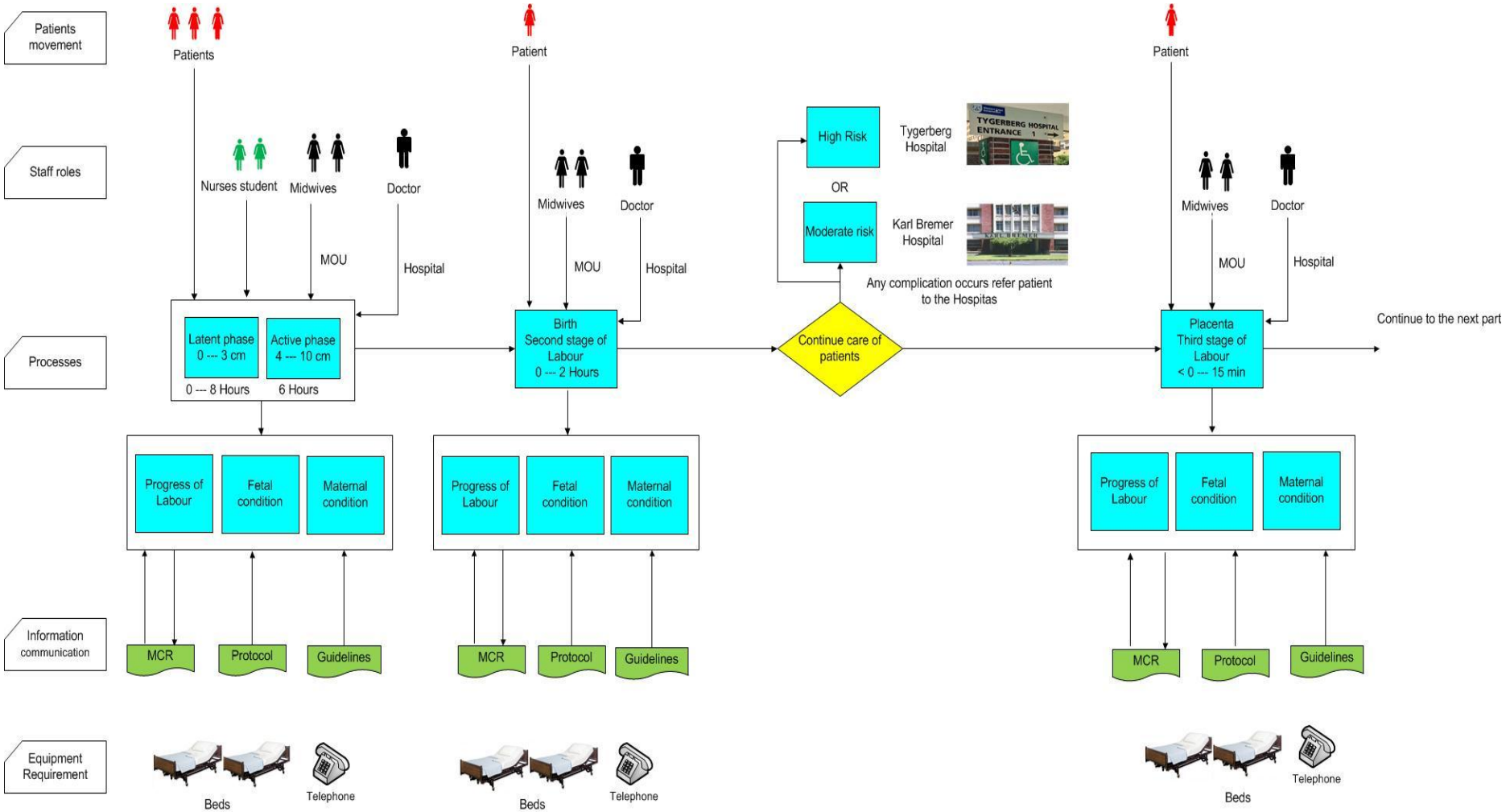


Figure 5.6: Intrapartum care 2 (process of labour)

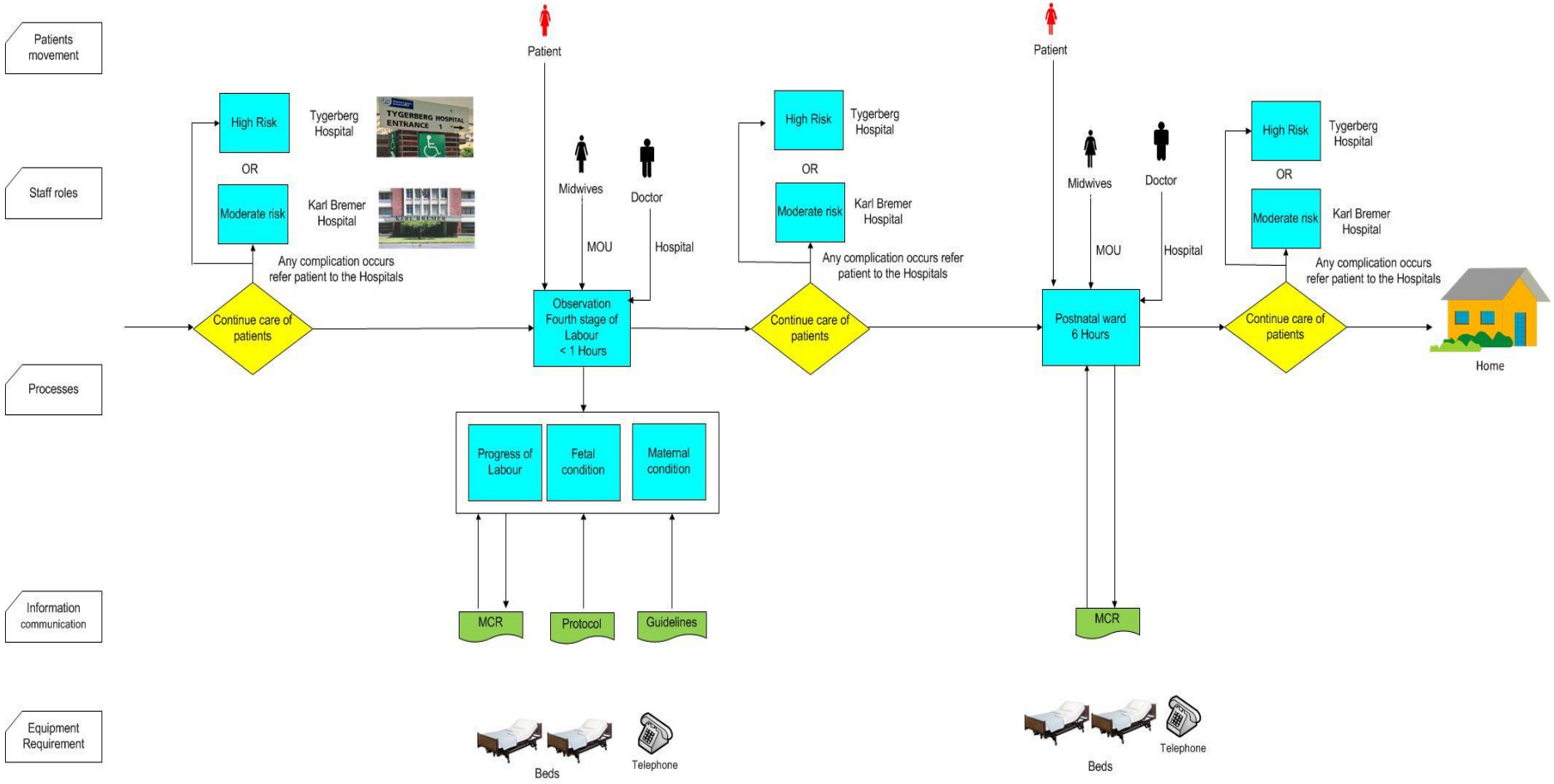


Figure 5.7: Intrapartum care 3 (process of labour)

An example of the information available to midwives is given in Figure 5.8.

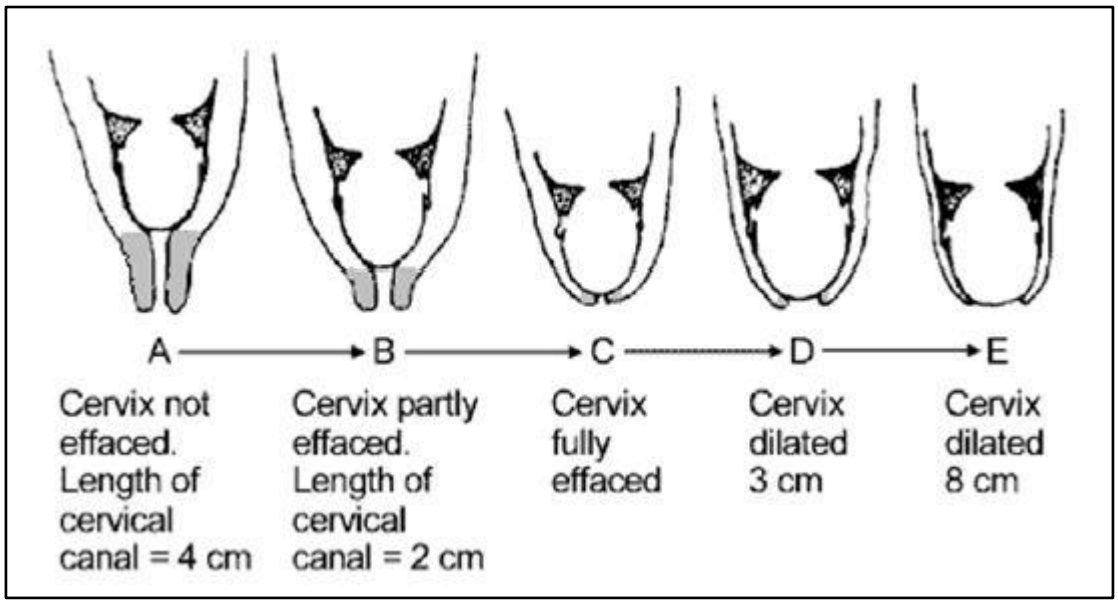


Figure 5.8: Cervix conditions during the first stage of labour

(Adapted from Bedford Hospital – NHS, 2012:1)

Below is another example of information available to midwives during the labour process in the form of a table.

Table 5.2: Description of cervix conditions during the first stage of labour

Cervix Conditions	Description of Cervix Conditions
A	Pregnant not in labour.
B	In the latent phase of labour where the cervix is shortening.
C	In the latent phase of labour where the cervix is paper thin and can now begin to dilate (open).
D	Now the latent phase of labour is becoming active labour
E	The woman is well on her way at 8 cms to have her baby. The baby can be born from 10 cms dilated, where the woman starts to push.

(Adapted from Bedford Hospital – NHS, 2012:1)

Another important activity in terms of information practices is the handovers when patient information is handed over from one midwife to another. This activity is discussed next. The main finding from the essomenic model regarding the second and third phases of the intrapartum care is:

- The midwives, assistants and doctors collaboratively capture observational information into the maternity care record to record the labour process and consult with each other, guidelines and protocols to decide whether the patient needs to be referred to the hospital in the case of a complication, or being further observed and cared for.

5.6 Midwives Handover Activities

In the Elsies River Midwifery Obstetric Unit, the midwives work from 7 AM till 06:45 PM as a day shift and also night day shift from 7 PM till 06:45 AM (see Figure 5.9). Midwives exchange occurs only twice at 06:45 AM when midwives' outgoing departs from day shift to midwives oncoming arrives for a new day shift as the researcher described below:

(Process A)

- The first process is a handover during the morning shift when incoming midwives exchange information with outgoing midwives
- The process of handover is an official process part of the midwives' work practices
- During handover midwives use the Midwifery Registration Book (MRB) and Maternity Case Record (MCR) book to record notes and sign off as part of the midwifery documentation process
- Midwives going off duty hand over patients at their beds to midwives starting their shift in order to ensure safe delivery of patients
- As illustrated as equipment, beds are where the patients are located and also the place where information around the MRB and MRC are communicated.

(Process B)

- Midwives' handover also occurs during the day shift particularly during tea breaks (1)
- Midwives are divided into two groups, one group continues working while the other group goes for a tea break which takes about 30 minutes
- When the one group returns another midwives exchange occurs again with a handover between the two groups
- A handover occurs between 09:00 – 09:30 AM for the first group and the following handover for another group occurs between 09:30 – 10:00 AM
- In the process of handover during the tea break there is not a documentation process in the MOU
- Also in process B handovers occur between midwives inside the MOU
- Midwives communicate verbally during handover with each other

- Sometimes if the midwifery is very busy, all midwives continue working during tea break in which case there is no handover
- After the tea break all the midwives work together from 10 AM until 12 PM as described in the process.

(Process C)

- Another handover occurs during lunch time for two periods of time from 12:00 – 01:00 PM and 01:00 – 02:00 PM.
- Midwives are divided into two groups, one group continues working with patients and the other group goes to lunch
- In process C during handover midwives communicate verbally between each other within the explanation of patients' circumstances by using the MCR book
- After lunch all midwives work together from 02:00 till 03:30 PM.

(Process D)

- As the same in the process (B) the only difference is the time hours for the afternoon tea.

(Process E)

- It is a similar process as occurs in process (A) the only difference the time where the night staff start their shift and the day staff complete their shift.

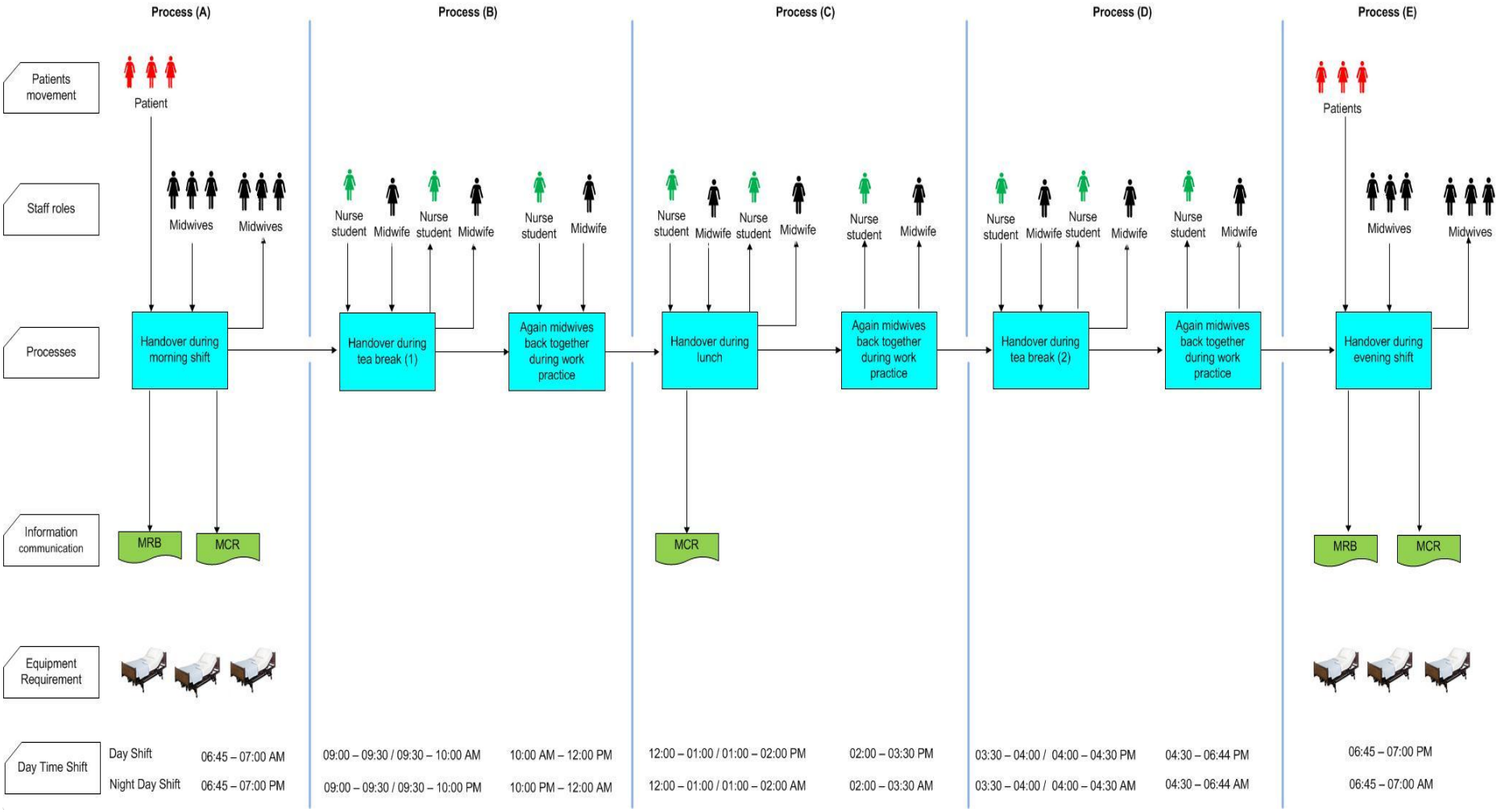


Figure 5.9: Handover process

The findings from the essomenic model regarding the handover activities are:

- The information of the current state of the patient is communicated by the midwives finishing their shift to the midwives starting their shift
- During the handover the information about the patient should reflect the actual condition of the patient to provide for a continuation in care.

5.7 Communication Process between MOU and HealthCare Services

In Figure 5.10 the different facilities available to pregnant women are indicated with a further indication of how patients can be referred between the facilities and the patient's home. The patients can be referred to the Tygerberg or Karl Bremer hospitals.

Flows of maternal healthcare services:

- In the ERMOU, the patients' assessment and treatment process begins from week one until week 40, from the antenatal stage, intrapartum to postpartum stage
- Midwives collaborate with Tygerberg and Karl Bremer Hospitals in order to provide a safe delivery service to mothers and babies in the MOU
- As the arrows appear in the diagrams, midwives communicate and collaborate with Tygerberg and Karl Bremer hospitals
- Midwives also receive patients from BANC Clinic as well (See Glossary of Terminology)
- In case of failure Midwives manage patients' circumstances in the ERMOU. In this case midwife sends patient to the hospital for extra support and safe delivery
- Midwives send patients home when the treatment process has been concluded or when there is no further need to care for the patients at one of the healthcare facilities.

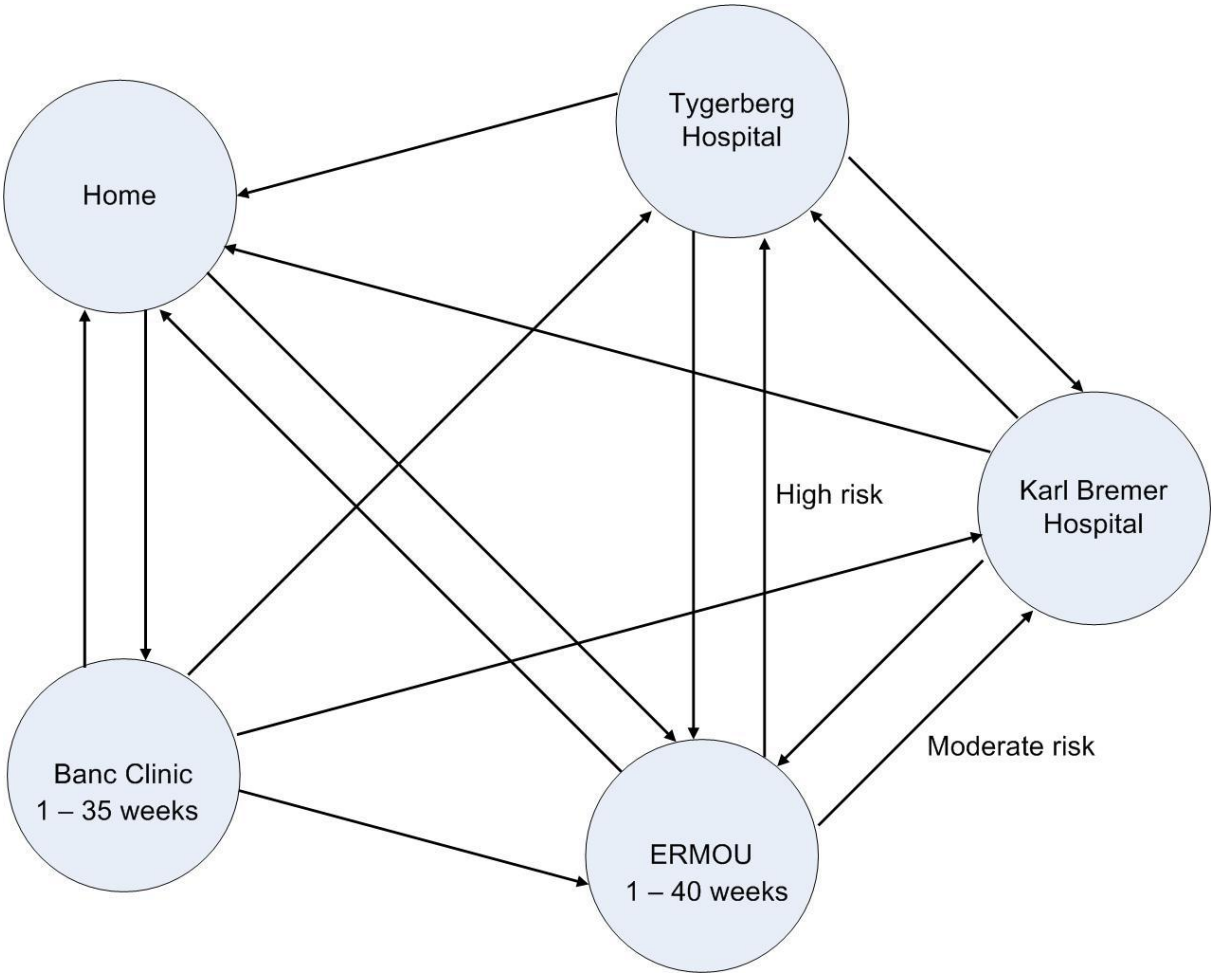


Figure 5.10: Communication between the patient's home and different healthcare facilities

5.8 Findings from the Essomenic Model

In this chapter the information flows were considered in terms of the midwives work practices. The essomenic model depicts the different information uses and individuals involved at the different points of the processes. A summary of the specific findings are:

- All the relevant information of the patient is captured during the first visit when the maternity case record is created
- All the processes require patient information (capturing or retrieving) by different healthcare professionals
- The outcome of the visit, to send the patient home or refer the patient to the hospital, is determined based on the information regarding the patient's condition in consultation with guidelines, protocols and if there is a complication, advice provided by doctors at the hospitals

- The findings of the second antenatal visit are the same as for the first visit except that the maternity case record for the patient already exist and is retrieved when the patient arrives at the ERMOU.

The findings of the intrapartum care phase are:

- The patient's information is retrieved from the maternity case record and the protocol and guidelines to determine the state of the patient to either refer or admit the patient.
- Thereafter the information relating to the labour process is continuously recorded and considered by the midwives to decide what to do.
- Midwives, assistants, and doctors collaboratively capture observational information into the maternity care record to record the labour process and consult with each other, guidelines and protocols to decide whether the patient needs to be referred to the hospital in the case of a complication, or being further observed and cared for.

The findings from the essomenic model regarding the handover activities are:

- The information of the current state of the patient is communicated by the midwives finishing their shift to the midwives starting their shift
- During the handover the information about the patient should reflect the actual condition of the patient to provide for a continuation in care.

5.9 Conclusion

Firstly, the chapter highlights the use of essomenic modelling within a midwifery unit in terms of midwives' journeys depicting the different processes in the MOU. Secondly, the essomenic model depicts the midwives' activities during their information and communication practices based on the information flows in the MOU. Finally, the researcher discussed and presented all the essomenic models of midwives journeys. Based on these models findings were derived relating the midwives' information and communication practices.

Chapter Six: Findings and Discussion

6.1 Introduction

The previous chapter discussed the application of the essomenic model in the midwife obstetric unit. The chapter demonstrated the midwives' journeys during the different activities of the first, second and subsequent visits and the intrapartum care stages 1, 2, 3. Furthermore, data was obtained from participants via interviews and observations; the methodology employed in this study context has been discussed and demonstrated in Chapter Three. The participants were asked to indicate their work practices and activities in the antenatal and intrapartum care environment. Additionally, the methodology guided the data collection as has been demonstrated accordingly in Chapter Three to indicate the research methods and design used for this study.

In Chapters Four and Five the data collected were analysed using thematic analysis and the essomenic modelling tools. The findings were interpreted to provide the answers to the research questions and to achieve the research objectives that guided the study. In addition, data was analysed to identify, describe and explore the information needs, information seeking practices and communication needs of midwives during the antenatal and intrapartum care environment. Furthermore, the findings will include relevant existing knowledge from a literature review to present the significance of the study context. The main focus of this chapter is to present and discuss the findings of information needs and information seeking practices during the antenatal and intrapartum care environment, encompassing communication need of midwives.

6.2 Summary of Findings

The findings of Chapters Four and Five are summarised and discussed next.

6.2.1 Information Needs of Midwives

The findings regarding Information needs of midwives indicate that:

- Information is an integral part of the midwives' work practices — they capture details and use previously recorded information about the patients they treat. Patient information appears in the maternity case record book
- Midwives need information to guide their work practices, e,g. maternal guidelines, protocols, etc.

- Midwives need to integrate patient information based on the patient observations and treatment with information from various sources such as guidelines and protocols, and in the case of complications, also information provided by doctors in referral hospitals.

This means that the information needs of midwives are essential for their work practices — without information they cannot provide a healthcare service to their patients. Their healthcare service activities include the capturing and retrieving of patient information; communicating with patients, colleagues and doctors; and consulting of additional information sources such as guidelines and protocols. Their care and information practices are totally integrated. When midwives do not have access to information when needed this has an impact on the care of the patient who can even die. One can therefore conclude that relevant information is essential for patient care, and must be available when needed.

6.2.2 Information Seeking Practices of Midwives

The findings relating to the midwives' information seeking practices are:

- They obtain information from various sources, often situated at different locations; integrate the information with their work practices; and share information with colleagues
- They often work as teams with collaborative information practices resulting in information exchanges and sharing
- They have to share information about the patients' conditions with doctors at the hospitals at different locations. The doctors have to rely on the information provided by the midwives to advise them on dealing with the patients' conditions, without actually seeing the patients.

Midwives typically work in teams and exchange and share information while they provide a care service. They have to simultaneously integrate information from various sources while engaging in providing care services. The information used, shared, and exchanged by midwives determine the outcome of decisions regarding the patient's condition and influences the care activities. One can therefore conclude that the midwives information practices are collaborative and integrated.

6.2.3 Midwifery Information Sources

The findings relating to information sources are:

- Information sources are still only paper-based

- Midwives use data from diverse different sources that include the details of the patients previously recorded in the maternity case record book; lab results; additional information from guidelines, protocols and relevant literature; colleagues; and specialists and doctors from the hospitals.

Information in the ERMOU is still paper-based and information is sourced from various diverse sources at different locations. The midwives' healthcare services will be influenced and can even be delayed if the relevant information cannot be located when needed. This could have a negative impact on the condition of the patient. The midwives still have to rely on the advice of doctors at the referral hospitals and since this is typically the case for patients with complications, it is problematic if the doctors, as an important information source, are not available.

6.2.4 Information Providers

The finding related to information provider is:

- Providers of information for midwives to use during their work practices are:
    - Midwives as information providers when they record the patient and labour process details as well as their decisions in the maternity case record book
    - The Department of Health provides information in the form of protocols and guidelines
    - Doctors provide additional information in the case of patients with complications.

Midwives are not only information consumers but also provide important information about the patient. The information about the patient that they capture is used in future healthcare services to the patient. It is important that the information captured is correct and complete. Midwives rely a lot on the information in the guidelines and protocols to guide them in providing healthcare services. It is important for the Department of Health to provide guidelines that are relevant and easy to follow, as well as protocols that will ensure the safety of the patients. In the case of ERMOU doctors are important information providers to advise the midwives about how to deal with specific situations. These doctors should be recognised as an essential information provider for midwives in MOUs that do not deal with medium and high risk pregnancies.

6.2.5 Communication Practices of Midwives

Findings specific to the communication of midwives are:

- Information is essential when midwives communicate with their patients, with each other, and with doctors
- Midwives' work practices are based on their communication with patients, with each other, and with doctors where information is obtained, provided, shared, exchanged, and recorded.
- Midwives use face-to-face communication with patients and each other, but use telephones to communicate with doctors at the hospitals.

Communication is an essential activity of healthcare services for midwives and is based on relevant, accessible, and complete information. Healthcare services are provided as collaborative activities with all the persons involved communicating with each other. Face-to-face healthcare services are provided to patients and information can be obtained from different sources with suitable communication channels. The choice of communication channel should depend on how the channel can be used during the work practices of the midwives to enhance the healthcare service and not to add further complexity to the communication.

6.2.6 Findings based on the essomenic models:

- All the relevant information of the patient is captured during the first visit when the maternity case record is created
- All the processes require patient information (capturing or retrieving) by different healthcare professionals
- The outcome of the visit — to send the patient home or refer the patient to the hospital — is determined based on the information regarding the patient's condition in consultation with guidelines, protocols and advice provided by doctors at the hospitals
- The findings regarding the second antenatal visit are the same as for the first visit except that the maternity case record for the patient already exist and is retrieved when the patient arrives at the ERMOU.

The findings of the intrapartum care phase are:

- The patient's information is retrieved from the maternity case record and the protocol and guidelines to determine the state of the patient to either refer or admit the patient.
- Thereafter the information relating to the labour process is continuously recorded and considered by the midwives to decide what to do.
- Midwives, assistants, and doctors collaboratively capture observational information into the maternity care record to record the labour process. They consult with each other,

guidelines, and protocols to decide whether the patient needs to be referred to the hospital in the case of a complication, or being further observed and cared for.

The findings from the essomenic model regarding the handover activities are:

- The information regarding the current state of the patient is communicated by the midwives finishing their shift to the midwives starting their shift
- During the handover the information about the patient should reflect the actual condition of the patient to provide for a continuation in care.

The findings from the essomenic modelling indicate that process modelling could streamline the processes in terms of the staff roles and information and communication. Each process can be considered to determine the optimum interaction with the information sources by the relevant staff in their different roles. Pressure points can be identified and addressed.

6.3 Information Needs of Healthcare Workers in Developing Countries

The study identified that information needs of midwives are essential and play an important role in the Elsies River Midwifery Obstetric Unit (ERMOU). Therefore, midwives deal with various situations that occur during work activities in providing patients' care in the MOU. Midwives need for information occurred during patients' management such as diagnosis and solution of specific problems. So, the researcher found that midwives require information from different sources such as the maternity case record book, midwifery BANC protocol, maternity guidelines, and questions to patients and colleagues. Also midwives can obtain information either from the MOU as main source, or external facilities which they also use as sources. For instance, midwives' communication and collaboration occur with doctors from Karl Bremer and Tygerberg hospitals as a routine process of work. This communication process accounts as a source of information that midwives utilise as a significant role to accomplish their tasks during work practice.

Prasad (2000:8) indicated that information demands were based on people's quest to satisfy their needs in order to solve problems or to make appropriate decisions. Pakenham-Walsh et al. (2012:11) highlight that the needs of healthcare workers for reliable, appropriate healthcare information and knowledge is fundamental to deal with the diverse circumstances in health organisations. Furthermore, health information needs are significant and have increasingly been considered, particularly in the diagnoses of patients (Leydon et al., 2000:909). In the ERMOU midwives rarely gain access to information from text books or a

literature review due to the lack of time. Therefore midwives gain access to most information in a maternity case record book and by advice from colleagues. According to Pakenham-Walsh and Bukachi (2009), many healthcare workers have no access to practical information during work practice and the majority of them act in the light of their experiences — which may result in success or failure. In the ERMOU, midwives have a vital role and accountability in providing care to pregnant women during the various stages of their pregnancies. The empirical data resonates with the literature findings above.

The study identified that midwives gain experience and knowledge through different programmes, for instance, services programmes (see Section 4.5 in chapter four), and by reading journal articles received from Health Department for updating midwives' information and knowledge. Furthermore, midwives also update their knowledge by reading nursing magazines through subscription to the DENOSA magazine, and also the midwifery text book. All these materials are required by midwives as information needs in the MOU. It is vital for healthcare workers to update their knowledge and to continue learning to ensure they are up-to-date with current knowledge in order to support their work environment (Andualem et al., 2013:1-2). Similarly, at multilevel, it is essential for healthcare workers to continue to improve their knowledge and skills to provide quality care and healthcare outcomes (D'Aamo et al., 2012:23-24; Global Health Workforce Alliance, 2010:1-2). The empirical findings indicate that midwives do update their knowledge, but this is difficult in an under-resourced setting.

The results of this study confirms that midwives work both as individuals and in teams to provide information needs and insight into roles that satisfy their patients' care needs in the MOU. Midwives utilised information from different sources. Beside information needs, researcher has explored the variety of information sources used by healthcare workers (midwives and doctors) in the ERMOU (Reddy & Spence, 2005:694). Sources of information are maternity case record books and informal sources such as midwives' colleagues and doctors. The study identified that most of their information needs are related to the patients' treatment and most information is retrieved from various information sources. Such information sources are medical record books, communication with doctors, and with patients (Rutten et al., 2005:250). Thus, the understanding of information needs of healthcare workers is critical and it assists them in the planning and managing of their work environment (Devadason & Lingman, 1997:41-51).

6.4 Information Seeking Practices of Midwives in Developing Countries

This study identified and explored the information-seeking practice of midwives in the antenatal and intrapartum care environment. Midwives seek information from various sources that they deal with during work practice. It was found that midwives seek information both as individuals and as a group or team, using the information sources indicated in chapter four (see Section 4.7). Typically, their information-seeking practices refer to essential human behaviour in seeking and using information, based on the information needs of a specific role (Case, 2012:3). For instance, midwives seek to retrieve information regarding treatment and diagnoses to make optimal decisions in the MOU. Essentially midwives need to be able to retrieve important information from relevant sources to accomplish these tasks (Ajayi, 2005:121-122). Savolainen (1995:267) highlights that every day people seeking information — whether at home, hospital, midwifery, and many different types of situations and environments (1995:267). This is still the case today, as indicated by the findings based on the empirical data.

The study identified that midwives' information practice is based on the process of seek, organize, and use of information for informed decisions during work environment. In decision-making, midwives also access and seek other sources of information, especially from their colleagues as the most important source (O'leary & Mhaolrunaigh, 2012:379; Rebecca & Jadesola, 2013:331-332). Therefore, midwives access other healthcare organisations according to the guidelines prepared by healthcare providers who work with a health department. The purpose of the guidelines is to assist healthcare professionals to deal with and manage different emergencies and circumstances that occur in the ERMOU. Most sources of information used are critical for midwives especially for making decisions about the patient's treatment. However, the study found that a midwife does not seek information from the internet, books, or library due to the lack of digital technology and time. Usually midwives seek information from midwifery colleagues (midwives and doctors) and a maternity case record book (patients' medical record); to make appropriate decisions. Midwives seek information from maternity care guidelines to ensure safe care of patients in the ERMOU.

The researcher found that midwives collaborate and seek information during their work practices in providing patient care and for informed decision making in the ERMOU. The collaborative information seeking practice is based on information sharing among the midwives in the ERMOU. Midwives collaborate and coordinate to seek important information in their physical work environment (Talja & Hansen, 2005: 113-134 cited in Reddy et al.,

2010:74; Dee et al., 2005:213-220). Furthermore, midwives collaborate and communicate with each other to accomplish these tasks in their work setting environment (Akporido, 2013:27-28). A study of information needs identified that nursing midwives seek and collaborate to retrieve the information from different sources to achieve their tasks (Shin et al., 2012:524-525 & Newman et al., 2007:1-2; Ajaya, 2005:121-122). However, the researcher explored information seeking practice of midwives in order to understand midwives' behaviours in relationship to information practice (Wilson, 2000:49-50).

6.5 Information Provider in the ERMOU

The study identified how midwives provide information during work activities in the ERMOU (see Section 4.8). The department of health also provides information and material related to midwives' practice to support their work activities. The purpose is providing information to meet their patients' needs and to ensure safe patient care in the ERMOU (Global Health Workforce Alliance, 2010:1-3)

6.6 Communication Needs of Health Workers in Developing Countries

The researcher indicates communication needs of health workers (midwives and doctors) in chapter two (see Section 2.10). Similarly, chapter four (see Section 4.9), reflects a similar key evidence of research study particularly in the ERMOU. In this sense, communication is a cornerstone to all healthcare organizations, particularly in the midwifery where multiple activities occur in the work practice environment (Thomas & Dixon, 2012:41). Information communication of health workers is increasingly recognized as essential to the success of work settings environment (Schwartz et al., 2010:1). The researcher found that healthcare professionals or providers (midwives and doctors) always communicate with each other to address their information needs of patients' care in the ERMOU. The study found that midwives communicate and collaborate regularly among each other during the antenatal and intrapartum stage in providing care to the mothers and babies in the ERMOU. Furthermore, the Nursing Midwifery Council has noted that nurses inform and share their knowledge with colleagues to ensure the safe care of patients in maternity care environments.

In this study, the researcher found that healthcare workers transfer and share knowledge and information among themselves to make vital healthcare decisions in health organisations similar to Schwartz et al., (2010:2). The study found that midwives communicate and collaborate effectively every day during the antenatal and intrapartum care. Moreover, midwives communicate with doctors from Karl Bremer and Tygerberg Hospitals in managing

patients' circumstances especially in emergency circumstances. Midwives communicate with doctors by phone in managing patients circumstances in the MOU (see Figure 4.9). Importantly, midwives' team consider communication and sharing of information as a significant role in managing high risk circumstances in the MOU (Thomas & Dixon, 2012:42). This was confirmed by this study.

Van Bekkum and Hilton (2013:2) highlight the importance of communication practice and the role of healthcare workers to improve patients' health outcomes. In this approach, communication practices are defined in information sharing and team collaboration during work environment. So, in the healthcare environment, communication and collaboration are assisting healthcare workers in decision making (O'Daniel & Rosenstein, 2008:1-2). In the ERMOU, midwives communicate face-to-face to make appropriate decisions and inform each other in providing care and solving problems. According to Edwards et al. (2012) effective communication among healthcare workers is significant to successful collaboration on patient care and decision making. This was confirmed by the findings of this study.

The research study identified that there is a strong rapport between ERMOU and both Karl Bremer and Tygerberg hospitals in verbal communication activities. In most cases, midwives communicate and collaborate with doctors from both hospitals in order to manage patients care circumstances and to ensure safe care delivery. Furthermore, information communication and sharing of knowledge are integral to the cooperative work of healthcare for safe delivery of patient outcomes (Wright and Endsley, 2008:97-98). However, midwives work as a team to communicate and seek information from colleagues in both hospitals regarding safe patient care (Mesmer-Magnus & Dechurch, 2009:535-536; Moorman, 2007:173-175). Sakyi (2010, 158-159) indicates that communication is an important process of interaction, information exchange, ideas, care plan, managing patients and decision making by healthcare workers. This was confirmed by the findings of this study.

6.7 Information Flow of Health Workers in the ERMOU

At ERMOU, the researcher found that communication needs are essential and their knowledge of midwives well communicated. It is also necessary to describe the information flows to indicate information sharing in the midwives' work practices environment. The researcher explored that midwives share, seek information, and collaborate during work practice as indicated by the journey model depicted in the essomenic models. It was found that midwives collaborate with colleagues and share their experiences and knowledge. To satisfactorily accomplish this task of midwives; adequate knowledge of information needs

and information seeking practice must be provided. It is however important to note that the provision of information is dependent on the availability of the information sources. In this sense, midwives communicate and share their information so that it can be fully utilised in the ERMOU.

In this research context, the findings of information and communication practices are determined by the midwives' tasks such as MOU decision support, information exchange, and collaboration with other midwives and colleagues. Although midwives share and communicate with doctors from both Tygerberg and Karl Bremer hospitals they often do not get the required information in the form of advice from the doctors when needed.

6.8 Essomenic Model in the ERMOU

The researcher found that the essomenic model could describe all the episodes of midwives that occured in the ERMOU. For instance, first antenatal visit (see Section 5.2), second antenatal visit (Section 5.3), subsequent visits (Section 5.4), intrapartum care (Section 5.5), midwives' handover activities (Section 5.6) and communication process (Section 5.7) together represent all the midwife activities in the ERMOU. The models supply more details about what is occurring in the different processes. The models also identified the gaps for further research, especially the consideration of information communication technology (ICT) to facilitate better information recording, retrieving, sharing, and exchanging in the ERMOU. The consideration of ICT solutions within a MOU has the potential to improve the information practices of midwives to enhance the quality of care for patients (Bath, 2008: 504-508). According to Bath, the development of a health information system could make an important contribution to health organisation (2008: 205). This could lead to computer supported cooperative work that will suit the collaborative nature of the midwifery practices in the ERMOU as well.

6.9 Conclusion

As established in the introduction, this chapter endeavoured to discuss the findings of the research topic within relevant knowledge. However, the research chapter covered findings of information needs and information seeking practice of midwives, as well as communication needs and information providers. In addition, the researcher presented the findings of essomenic models within a brief representation of health informatics in midwifery practice.

Chapter Seven: Conclusions and Recommendations

7.1 Introduction

The previous chapter presented the findings and discussions of the research context. In this final chapter a brief summary of the research process will be highlighted as conclusions and recommendations that resulted from this study. Essentially, the main purpose of this chapter is to summarize the study of information need and information seeking behaviour or practice of midwives during the intrapartum care environment. In addition, the chapter encompasses communication needs of midwives during the antenatal and intrapartum care environment. The research was conducted in the Elsies River Midwife Obstetric Unit. Furthermore, the researcher provides the outline of the research project with a summary of findings. Finally, this chapter includes a section which points to possible future research in this field.

7.2 Summary of Chapters

Firstly, the research gives an overview of the information needs and information-seeking behaviour or practice of midwives in developing countries, particularly in South Africa. As an essential domain of the health sector, little research has been conducted into information needs and information-seeking behaviour or practice of midwives. Health information systems became an important domain in the health sector which addresses the issue of development in the health organization, especially related to health workers (midwives and doctors). The development of a health information system is based on stakeholder needs which are described by the study of human behaviour to address their requirements, their demands, and needs. However, this research focuses on information needs and information-seeking behaviour or practice of midwives during the antenatal and intrapartum care environment. The research was conducted in the Elsies River Midwifery Obstetric Unit as a case study.

Furthermore the research includes the communication needs of midwives during the antenatal and intrapartum care environment. In chapter one, the research highlighted the problem statement “the information-seeking behaviours and communication needs of birth attendants in the antenatal and intrapartum care environment are unclear and undefined”. Therefore, information-seeking behaviour and communication needs of midwives are significant areas of the health sector and play an important role in a midwifery setting. A midwife is an important source of information and has many functions during work practices within patient support. The midwife also provides a patient with information and necessary support to make an appropriate decision or to resolve a problem. Further, midwives communicate with colleagues to seek information needed to make a diagnosis or decision.

Again the communication is very important for midwives to be in a position to give the necessary care to mothers and babies during work practice environment.

The research presents an overview of the study context in order to realize the research objectives through several processes and the time frame to achieve this research context. Indeed, the research project presented research questions and objectives as well (see Table 1.1 and 1.2). A major focus of the study was to explore the study context as indicated in chapter one and repeated in later chapters. In addition, the research provided midwifery information practice and midwifery guidelines, which are indicated in the literature review. In addition, the research demonstrated information needs and information seeking behaviour or practice of midwives, including the model of information seeking behaviour by Wilson (1981) (see Section 2.7 in chapter two). Mainly used by midwives as sources of information are the maternity case record books, midwifery guidelines, midwifery protocol, and midwives colleagues. The research considered communication needs and practices of midwives in the midwifery obstetric unit as described in the literature review as an essential part of the midwives' function. Moreover, midwives teams are an important aspect of healthcare. Midwives communicate and collaborate with each other regarding the care of patients and decision making. Midwives communicate and collaborate while seeking information to provide good care to women and their babies during work practice environment.

The central theme of midwives during work activities is cooperative work practice as it is indicated in the literature review (see Section 2.12). Midwives form collaborative teams working together and communicating, sharing, and exchanging information in order to implement a successful task. Therefore, Computer Supported Co-operative Work (CSCW) is also described in the literature review. The purpose of CSCW is to present the possibility of a co-operative team working together as network in the organization. Again CSCW is made in order to enhance the situations, process and activities that occur during work environment in midwifery. Basically, the benefit of CSCW is to improve the collaborative work groups and the activities in midwifery practice. Furthermore, the research again included Computer Supported Collaborative Information Seeking (CSCIS) which investigates how people can seek information and collaborate through using technology.

CSCIS is based on members of a team or organization collaborating, seeking, and exchanging information sources such as documents, notes, medical textbooks, electronic medical records within a network of enabling technologies. This technology includes tools for searching, sorting and filtering the shared repository among the team of midwives and their collaborators to seek and retrieve needed information in the work environment. Through CSCIS midwife teams can collaborate, seek, and share information from medical records in

midwifery. Thus, an important source of sense-making regarding information is found, shared and used during work practice. In addition, health informatics use information and information technology in healthcare and midwifery practice as has been highlighted in chapter two literature review. The contribution of health informatics is to ensure the enhancement of several situations and well-being of patients in midwifery.

The researcher obtained permission for the research from the Faculty of Informatics & Design at CPUT, and from the Western Cape Provincial Health Department. The permission was required to gain access and conduct research in the ERMOU. The researcher provided a letter of informed consent to each of the midwives so that the participants were aware of the research process, particularly in gathering data during observation, and an interview. The letter of Informed consent demonstrates the principles of the research process and includes voluntary participation, anonymity, and confidentiality. The purpose of informed consent is to avoid any harm that can emerge, and also to protect the researcher, the supervisors, and the institution (CPUT). It was significant for the researcher and midwives' participants to be aware about the issue of research ethics. The researcher built rapport with participants for comfortable communication and conversation during the interview process.

In chapter three the researcher presented research methods and designs to obtain data from participants in the ERMOU. The researcher employed a case study and used interpretive research as it is able to explore information-seeking behaviour and communication needs of midwives. Furthermore, interpretive research was used to achieve insight into the situation and to gain knowledge in the study context. The researcher employed a purposive sampling technique and conducted in depth semi-structured interviews and observations with nine participants. Data was transcribed and interpreted, after which the researcher used thematic analysis to identify and analyze themes that had emerged from the study context.

Chapter four presented data analysis and interpretation of information-seeking behaviour or practice and communication needs. In chapter five the researcher discussed the application of the essomenic model in the ERMOU, demonstrating the midwives' journeys during various activities. Chapter six discussed findings of the research context within the relevant knowledge of the literature review. Eventually, chapter seven provided research conclusions and recommendations.

7.3 Research Question Revisited

The findings reported in the research study are summarized by returning to the research questions and objectives that were stated in chapter one (see Table 1.1 and 1.2). The main research questions indicated the key components of the research topic and concern in

conducting the research study. The research sub-questions demonstrated information needs and information-seeking behaviour or practice, as well as communication needs of midwives in the ERMOU. The answers of the research questions are discussed in chapter four. The research sub-questions were based on interviews, observation, case study and literature analysis. The researcher conducted the interviews with individual midwives to obtain the research results. All midwives responses were examined in chapter four in different sections. In fact chapter four demonstrated all the answers to the research questions and including data collected through the observation as well.

The research sub-questions are answered as follows:

What information is needed by the midwife to provide healthcare services in an antenatal and intrapartum environment? The midwives need information from different sources relevant to the care of the patient. The information is supplemented with information from guideline documents and protocols, complemented by advice from doctors at the referring hospitals for patients with complications. The patient information and details about the pregnancy and labour process is captured in, and retrieved from, the maternity case record.

How is the information sought by midwives? The midwives have to locate the maternity case record books of patients to obtain details and record their observations and treatment. They also consult with guidelines and protocols to guide them and in some cases also additional sources. In the case of complications they phone the doctors and then consult telephonically about the patient's condition. They then take a decision about what to do with the patient based on the doctor's response. Midwives exchange information among each other.

How is the information provided? The information is paper-based and they have to locate the actual documents with the information. Information is also provided telephonically by doctors from the referral hospitals.

Who/what are the information providers? The midwives provide information based on their observations and to record their healthcare activities. Doctors at referral hospitals also provide information in the case of potential complicated cases. The Department of Health provides guidelines and protocols. The patients provide information about themselves and their pregnancy condition.

The above sub research questions provide the basis for the first main research question: What are the information seeking and communication practices based on the needs of

midwives in the antenatal and intrapartum environment? The answer to this question is that midwives use information as an integral part of their care practices and therefore one can conclude that their work practices include their information practices. They obtain information from different paper-based sources and also from other healthcare professionals in a face-to-face manner or telephonically.

The answers to the sub research questions for the second main research question are:

What are the contextual factors that influence the care services in a MOU? The ERMOU is under-sourced for the number of patients they have to service. The entire service is still paper-based and the recording of information is taking up a lot of time. There is not a specialist doctor at the ERMOU and if midwives suspect complications they have to phone the doctor at the referral hospitals who may not be available when needed. In such cases the midwives have to use their own discretion to decide what to do with the patient.

How is information sourced and communicated during the antenatal and intrapartum stages? Information is sourced from the maternity care record as a normal part of the antenatal and intrapartum care processes. Information is sourced from the guidelines and protocols when needed. Information is sourced telephonically from doctors at the referral hospitals in the case of a suspected complicated pregnancy. Midwives exchange information with each other during the care processes and specifically as part of the hand over processes.

How do midwives exchange information as they communicate to each other during the difference phases of the antenatal and intrapartum stages? Midwives work in teams and exchange information during their collaborative care practices to ensure that each person providing the care service to the patient has all the details of the patient.

The above research sub-questions form the basis of the second main research question: **How does the context influence the information seeking and communication practices during the antenatal and intrapartum stages?** The contextual factors contribute towards a more complicated environment making it difficult for midwives to source the relevant information that could hamper the healthcare service to the patients.

7.4 Recommendations

This study explored the information needs and information-seeking behaviour or practice of midwives including communication needs of midwives. The following are recommendations for future work and research:

- Conduct more studies at other midwifery obstetric units in different contexts to compare all the results for a better understanding of the role of information within a MOU environment. The feedback would contribute to midwifery research and health sectors in general.
- Include more participants in the study for instance doctors and nursing assistants to get a more comprehensive view of information practices of all the staff at a MOU.
- Conduct research on the possibility of implementing electronic health record systems. It could assist midwife teams and other healthcare facilities such as Tygerberg and Karl Bremer Hospitals. It could help health professionals to manage patients' information and procedural requirements and also with the valuable information that they need during delivery of healthcare services. A proper understanding of the information practices of the healthcare professionals for the different processes will contribute towards the design of a relevant information system.
- Specifically include good information practices in relevant midwifery educational programmes to improve midwives' practices and education.

7.5 Future Research

The study context in this thesis provides suggestions for future research. It would be important to continue research in health informatics among health professionals in order to address the gaps in maternal healthcare services. In this study context, there are a variety of gaps and it would be important to continue for further research. Again this research study may be considered as a source for further investigations in areas not covered. For instance, midwives communication needs, midwives' use of electronic health records system, and midwifery education and informatics.

7.6 Conclusions

The conclusions of this chapter are presented as general conclusions of the research thesis. In this research study the knowledge is based on exploring of information needs and information seeking practice of midwives during the antenatal and intrapartum care environment. The research encompasses communication needs of midwives as well. Moreover, the summary of chapters and research were demonstrated and research questions were revisited. Additionally, the recommendation and future research were indicated as well. In this sense, the researcher has covered what is of significance in the research topic. Again the researcher has indicated the importance of continuity of research in future for more health informatics and midwifery education.

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Appendices

Appendix A: Permission Letter from Faculty of Informatics & Design

Cape Peninsula
University of Technology

P.O. Box 652 • Cape Town 8000 South Africa •Tel: +27 21 469 1012 • Fax +27 21 469 1002
80 Roeland Street, Vredehoek, Cape Town 8001

Office of the Chairperson Research Ethics Committee	Faculty of Informatics and Design

At a meeting of the Faculty Research Ethics Committee on 25 October 2012, ethics approval was granted to Mr Alrasheed Mustafa, student number 212107852 for research activities related to the MTech: Information Technology at the Faculty of Informatics and Design, Cape Peninsula University of Technology.

Title of dissertation/thesis:	Information behaviour in midwifery: a case study of an intrapartum care environment in the Western Cape, South Africa

Comments

Research activities are restricted to those detailed in the research proposal.

Signed: Faculty Research Ethics Committee	Date
	26/4/2013

FACULTY OFFICE
INFORMATICS & DESIGN
26 APR 2013
Cape Peninsula
University of Technology

Appendix B: Permission Letter from Western Cape Provincial health authority

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 6857: fax: +27 21 483 9895
5th Floor, Norton Rose House,. 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za

REFERENCE: RP 064 /2013
ENQUIRIES: Ms Charlene Roderick

25 Bradwell Road
Vredehoek
Cape Town
8001

For attention: Alrasheed Mustafa

Re: Information Behaviour in Midwifery: A Case Study of an Intrapartum Care Environment

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.
Please contact the following people to assist you with any further enquiries in accessing the following sites:

Karl Bremer	**L Naude**	**Contact No,.021 918 1222**
Elsies River MOU	**R Kasker**	**Contact No. 021 931 0213**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final report within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
3. The reference number above should be quoted in all future correspondence.

We look forward to hearing from you.

Yours sincerely

DR NT Naledi
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE: 21/11/2013
CC **L BITALO** **DIRECTOR: NORTHERN / TYGERBERG**

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Appendix C: Letter of Informed Consent

Cape Peninsula
University of Technology

Letter of informed consent

In this study, the focus is on Health Informatics which is a programme available in the Information Technology department at CPUT for continuing research, education and adding knowledge to the students for life improvement.

The researcher will conduct a face to face interview with a nursing midwife and student midwives as a focus group and individual to gather sufficient information. This interview will be audio recorded and a picture will be captured without involving patients. Midwives are taking an active role in this research and developing new knowledge. It is important to make a potential participant as comfortable as possible about discussing the research, so that you can be able to give more information in this research and feel confident enough and comfortable to ask questions. All of your information and interview responses will be kept confidential.

A major role is your voluntary participation in this study. It is up to you to decide whether or not to take part in this study but you will be asked to sign a consent form. If you decide to take part in this study, you are still free to withdraw at any time and without giving a reason. You are free to answer any questions if you choose. This will not affect the relationship you have with the researcher. Also there are no potential risks, no harms as well.

Only the researcher will have access to the study data and information gathered during this project. There will not be any identifying names on the interview transcripts, they will be coded and the key to the code will be kept locked away. Your names and any other identifying details will never be revealed in any publication of the results of this study. The audio recorded will be destroyed at the completion of the study. The result of the research will be published in a professional journal or presented at professional meetings. It may also be published in book form. The knowledge obtained from this study will be of great value in guiding professionals to be more effective in nursing informatics research.

If you have any questions or concerns, please contact the researcher or his/ her supervisor.

By signing this consent form below, I acknowledge that I have read and understand the above information. I am aware that I can discontinue my participation in the study at any time.

Participant	Date	Signature
Researcher	Date	Signature

Appendix D: Interview Questionnaire

Cape Peninsula
University of Technology

Interview Protocol Form

Title research project: Information Behaviour in Midwifery: A Case Study of an Intrapartum Care Environment.

Purpose of research interview:

The research project focus on information needs, information seeking practices or information behaviour and communication needs of midwives during intrapartum care. The research area focus on context of how midwives are going to seek and search for this information, interact, collaborate and communicate with colleagues during intrapartum care environment in a work setting.
Before we start to conduct the research interview the researcher will describe some keywords to be clearer than in the interview and scope subject to understanding and providing specific information related to this interview.

Information-seeking behaviour: is the purposive seeking for information as consequence of a need to satisfy some goal. The individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web).

Notes to interviewee:

To facilitate our note taking, the researcher would like to record our conversations today. Please sign the release form. For your information, only researchers on the project will be privy to the records which will eventually be destroyed after the researcher has transcribed. In addition, you must sign a form devised to meet our human subject requirements. Essentially, this document states that: (1) All information will be held confidential, (2) Your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) We don't intend to inflict any harm. Thank you for agreeing to participate.
I believe your input will be valuable to this research and in helping grow all of our professional practice.

Confidentiality of responses is guaranteed.

Approximate length of interview: an hour, eleven major questions

The research provide several questions related to this particular study, if there is a situation during your work setting and also your experience is very important perhaps it will give a full picture about this research and the benefit of this study.

Interview questions:

1) What kind of information do you need before you start to prepare for work practice or during work practice?

2) How do you seek or find this information?

3) When do you seek the information during work practices?

4) How do you provide the information during an intrapartum care practice?

5) What information is available?

6) What do you think about this information as you are a midwife? Is it critical information?

7) Do you seek this information always or sometimes? Which situation do you search about this information?

8) Who provide this information?

9) What are the information providers?

10) How do you communicate with colleagues when you seek information during work practices?

11) How do you share the information with colleagues during practice?