

**EQUIPMENT AS A POTENTIAL IMPEDIMENT TO OPTIMAL INTRAPARTUM
MONITORING AND DELIVERY OF PREGNANT WOMEN IN PUBLIC
HOSPITALS OF SEKHUKHUNE DISTRICT, LIMPOPO PROVINCE, SOUTH
AFRICA**

by

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DISSERTATION

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DEDICATIONS

To my family, I would like to dedicate this dissertation to my late father and late mother, who had always encouraged me to work hard in my studies. I also want to dedicate the dissertation to my siblings Kabelo, Thabo, and Mahlatse for their support and encouragement provided during my studies. This dissertation is also dedicated to all midwives who participated in the study from Sekhukhune district hospitals.

DECLARATION

I declare that "*Equipment as a potential impediment to optimal intrapartum monitoring and delivery of pregnant women*" (dissertation) hereby submitted to the University of Limpopo, for the degree of Masters in Nursing has not previously been submitted by me for the degree in at this or any other university; that it is my work in design and that it is my work in design and in execution, and that all material contained herein has ben duly acknowledged.

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Date

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ABSTRACT

Background: Medical equipment is an important tool in a Labour Unit to assess, monitor, diagnose and prevention of complications during labour. The purpose of the study was to investigate how equipment is a potential impediment to optimal intrapartum monitoring and delivery of pregnant women.

Research method: Across-sectional descriptive design of quantitative research approach was used to investigate how equipment impede monitoring and delivery of pregnant women. A total of 59 midwives were recruited for participation in the study. Data collected using an electronic structured questionnaires were analyzed with descriptive statistics on a Statistical Package for Social Sciences (SPSS) version 28.0.

Results: Midwives described a lack of equipment, and non-functionality of some equipment as barriers for intrapartum monitoring and delivery of pregnant women. Midwives expressed that improving the equipment is significant for optimum labor practice. However, midwives noticed that the use of equipment for infection control and prevention during intrapartum was of optimum practice.

Conclusion: The availability of good working equipment in the labor unit is needed to enhance optimal intrapartum monitoring and delivery of pregnant women. Therefore, it is recommended that quality and quantity of equipment in labour unit need to be monitored with daily checklist, improved effectively by fixing or replacing to minimise barriers to optimal care of pregnant women during labour.

Keywords: Delivery pregnant women, Impediment, intrapartum, monitoring, optimal.

DEFINITION OF CONCEPTS

Delivery

Delivery refers to the birth of the baby, placenta, and membranes (Sellers, 2018). In this study, delivery will be focused on how midwives utilize the equipment to deliver the baby, placenta, and membranes from a pregnant woman.

Equipment

Equipment refers to the instruments that are needed for a particular purpose or activity (Deuter, Bradbery & Turnbull, 2015). In this study, equipment will be all apparatus, materials, utensils, and furnishings in labor units that are essential to midwives for practising optimal intrapartum monitoring and delivery of pregnant women.

Impediment

Impediment refers to something that delays or stops the progress of something or an obstacle (Deuter, et al., 2015). In the study, impediment will refer to hindrances or difficulties from the use of equipment to provide optimal intrapartum monitoring and delivery of pregnant women.

Intrapartum

Intrapartum care refers to the period from the commencement of true labor throughout the first, second, third, and fourth stages of labor, which lasts 1 to 2 hours after delivery of the placenta (Lowdermilk, Perry, Cashion & Alden, 2012). In the study, Intrapartum will refer to the period from the onset of labor to the birth of a child.

Pregnant women

Pregnant women refer to the state in which a woman carries a developing fetus, normally in the uterus (Elizabeth & Martin, 2015). In the study, pregnant women will be women at term whom care is administered to, during intrapartum and delivery.

Optimal

Optimal means best possible or producing the best possible results (Deuter, et al., 2015). In the study, optimal will refer to all measures taken to monitor pregnant women during intrapartum and delivery about the use of equipment.

Potential

Potential refers to the possibilities of something happening (Waite, 2013). For purpose of the study, potential will refer to possibilities in which equipment may be a barrier for optimal intrapartum monitoring and delivery of pregnant women.

LIST OF ABBREVIATIONS

BP	Blood Pressure
CEO	Chief Executive Officer
CTG	Cardiotocography
DoH	Department of Health
EFMR	Electronic Foetal Heart Monitoring
FHR	Foetal Heart Rate
FHRM	Foetal Heart Rate Monitoring
IPC	Infection Prevention and Control
LMIN	Low and Middle In-come Countries
MMR	Maternal Mortality Rate
OPV	Operative Vaginal Delivery
SANC	South African Nursing Council
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goals

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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Equipment is important tool in the labor unit to assess, monitor, diagnose and prevent complications during labour. Medical equipment has a lifecycle requiring calibration, maintenance, repair, user training and, finally, retirement to achieve its effective use (World Health Organisation, 2011). Therefore, labour units must be equipped with functional equipment to achieve good childbirth when monitoring and delivering pregnant women. Childbirth should be a safe and rewarding experience for women and their families - however, it is estimated that globally over 300 000 women die during pregnancy and delivery every year largely due to substandard care in labor wards (Chandrahara & Arulkumaran, 2021). World health Organisation (2018) reports that it is a requirement that basic and adequate equipment for utilization during labor and childbirth is always available in sufficient quantities in the maternity units. Therefore, it is vital to have available equipment in labor unit, that ensures a physiologically safe birth as well as a positive childbirth experience (Cheyne & Duff, 2019).

A good childbirth is a beautiful, passionate, and life-changing experience with- a deep and empowering rite of passage into motherhood (Haydock, 2014). Available non-functional equipment can hinder service delivery for a pregnant woman in labor, hence can impede optimal care. A study in Sierra Leone indicated that the checklist entries for labor on delivery equipment could assist in improving optimum care during intrapartum monitoring and delivery for pregnant women (Koroma, Kamara, Keita, Lokossou, Sundufu & Jacobsen, 2019). The checklist included a blood pressure monitor, a stethoscope, an infant weighing scale, a foetal stethoscope, a sterilizer, a thermometer, a manual vacuum aspirator, protective clothing, specula, a vacuum extractor, obstetric forceps, scissors, needles, suture materials, needle holders, clean towels, blankets, and neonatal resuscitation equipment. Koroma, et al. (2019). Further indicated that the items deemed to be unsatisfactory when they were not functional, unhygienic

or had missing parts, should be prioritized for maintenance to effectively achieve optimum monitoring and delivery of a pregnant women.

Cardiotocography (CTG) is one of the essential equipment used to assess fetal wellbeing during intrapartum. In a study conducted in England, intrapartum Electronic Fetal Monitoring (EFM) using CTG is the recommended method for monitoring the fetal heart rate during labor for high-risk births (Kelly, DixonWoods, Lame, Liberati, Canham, Hinton, Kuhn, Draycott, Winter & Burt, 2020). Hence, an abnormal CTG indicates the need for further review and management, including potential urgent intervention to minimize risk of serious long-term harm to the baby or stillbirth (Kelly, et al., 2020).

Health facility services need to improve by providing equipment and supplies to increase women's satisfaction with services received during intrapartum of pregnant women (Sigalla, Bakar & Manongi, 2018). However, Midwives in SubSaharan Africa experience difficulties to provide optimum care which is challenged by an increasing number of deliveries in the facility, with a lack of resources within the facility (Bradley, Mc Court, Raymond & Parmar, 2019). Similarly, in Philippines the essential routine monitoring and assessment during labour are not sufficiently conducted despite being compounded by inappropriate infrastructure and supplies (Masuda, Ferolin, Masuda, Smith & Mutsai, 2020). Therefore, mentioned authors demonstrate that although the use of equipment is significant during intrapartum monitoring and delivery of a pregnant woman, sufficient allocation and effective utilization of equipment by midwives remain a barrier for achieving optimum service delivery in maternity units.

Locally in South Africa, a study showed that a shortage of medical equipment, due to either unavailability or non-functioning is a barrier to the ability of the health system to deliver quality health services (Moyimane, Matlala & Kekana, 2017). Midwives are important personnel in maternal and new-born care because they are the fundamental role players in the provision of care throughout antepartum, intrapartum and post-partum periods (Sumbane, Phaladi-Digamela & Mbokazi, 2017). According to the South African Nursing Counsel (SANC) regulation

R.2488 (1990 as amended), there are conditions under which a registered midwife may carry on her profession which indicates that in the course of her practice, a registered midwife shall, at all times, have available equipment and materials that are required for the practice of midwifery, including the equipment and material necessary to perform an episiotomy and to suture an episiotomy or a first/second degree tear of the perineum.

Therefore, there is a need for accessible functional equipment to ensure the provision of high-quality care during the intrapartum stage to minimize substandard care practices thereby reducing risks of preventable mortality and morbidity among mothers and new-born babies.

1.2 PROBLEM STATEMENT

The researcher observed that there were potential hindrances related to equipment used to deliver quality optimal care to pregnant women during intrapartum and delivery. Equipment such as cardiotocography (CTG) and blood pressure (BP) machines was of inadequate to monitor all pregnant women at the same time during intrapartum. Often seen that pregnant women were monitored on one CTG machine in the entire Labor Unit, also one BP machine will be used to monitor women during intrapartum and further in the fourth stage of labor. This can affect the quality of service rendered to mothers while making it difficult for early diagnosis of fetal conditions, hypertension related conditions and prevention of complications and further creating barriers in the service administration for pregnant women in labor.

The researcher has also observed that there were limitations in conducting quality optimal care during deliveries of pregnant women due to non-functional equipment. In a situation where there were non-functional episiotomy scissors and umbilical-cord scissors, midwives seemed to improvise by utilizing razor blades to perform episiotomy and separate the umbilical cord from their mother's placenta. The use of razor blades can result in harm to a neonate, mother, and

to midwives, also a risk practice that can result in preventable birth injuries, thus providing a room for a sub-standard practice.

Given the above background, the researcher developed the interest to conduct the study to investigate how the equipment could impede intrapartum optimum monitoring and delivery of a pregnant woman, thereby promoting positive birth outcomes and minimizing harm to mothers and babies.

1.3 THEORETICAL FRAMEWORK

1.3.1 Overview of Theoretical View

The theory is defined as a set of concepts and a statement that present a view of a phenomenon (Grove & Gray, 2019), furthermore a theory represents a systematic explanation of the relationships among phenomena (Brink, Van der Walt & Van Rensburg, 2018). The nursing need theory of nurse theorist Virginia Henderson was adopted in the study.

Virginia Henderson developed the nursing need theory to define the unique functions of the nursing practice. The theory focuses on the importance of increasing patients' independence to hasten their progress in the hospital (Gonzalo, 2022). Virginia Henderson addressed four major concepts of the need theory as the individual, health, environment, and nursing. Henderson identified fourteen components of basic nursing care, based on human needs, which are required for effective nursing care (Gligor & Domnariu, 2020). The 14 components of nursing care also called 14 basic needs revolve around meeting patient's needs (Butts & Rich, 2021). The 14 basic needs identified by Virginia Henderson are: (1) breath normal, (2) eat and drink normal, (3) elimination of waste, (4) move and maintain desirable position, (5) sleep and rest, (select suitable clothing-dress and undress, (7) maintain body temperature, (8) keep body clean, (9) avoid danger in the environment, (10) communicate in expressing emotions, (11) worship with one's faith, (12) work in such a way that there is a sense of accomplishment, (13) play or participate in various form of recreation,

(14) learn, discover, or satisfy the curiosity (Gligor & Domnariu, 2020).

The 14 components of the nursing care are important in the provision of midwifery care to patients during labour. For the health of both the mother and new-born for example component no. 9 which indicates that to avoid danger in the environment, since a lack of proper or malfunctioning equipment during childbirth might endanger the life of both the mother and the new-born. As such it is of vital importance that midwives ensure that the components are adhered to when providing nursing care. Henderson's nursing need theory was used to guide the study. Figure 1.1 below shows Henderson's four major concepts of the nursing need theory that was adopted in this research study.

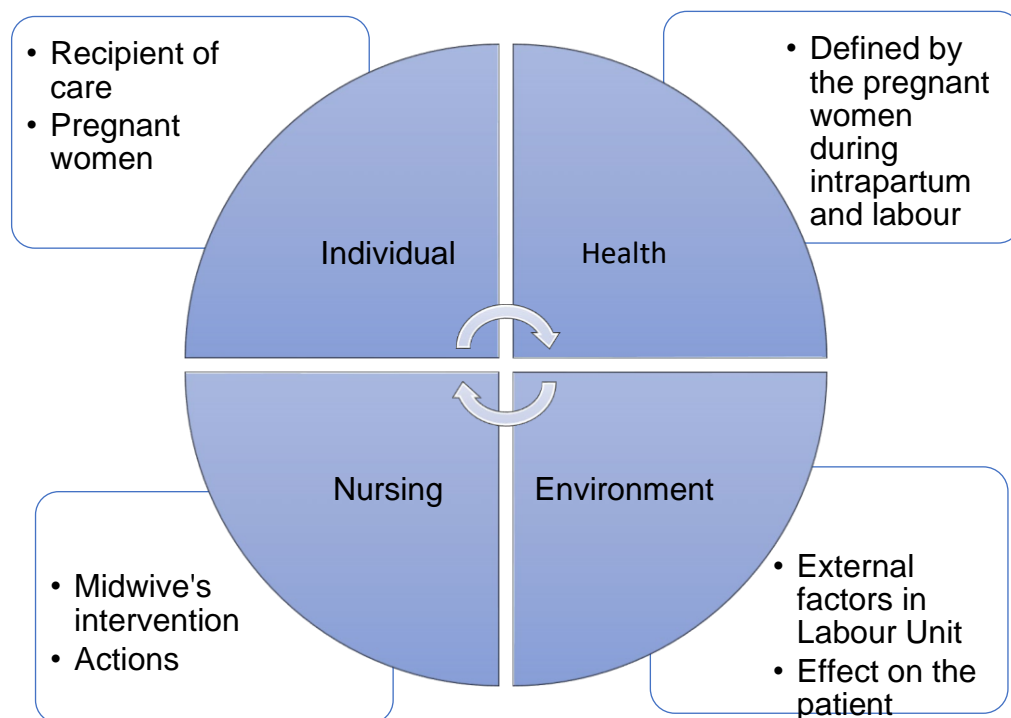


Figure 1.1: Virginia Henderson's four major concepts in the nursing need theory
(Source: adapted from Alligood, 2018)

1.3.2 The four major concepts of nursing need theory.

- **The individual**

Henderson viewed a patient as an individual who require assistance to achieve health and independence (Masters, 2015). Virginia Henderson viewed the patients as an individual who requires help toward achieving independence and completeness or wholeness of mind and body (Alligood, 2018). Concerning the study, human beings were all pregnant women during intrapartum and delivery with basic health needs to achieve health. Pregnant women in labor need nursing care with the use of equipment to monitor the progress of labor and for delivery care, to maintain optimal health and maintain independence.

- **Health**

Virginia Henderson views health in terms of the patient's ability to perform unaided 14 components of nursing care and it is the quality of health rather than life itself; that margin of physical vigor that allows a person to work most effectively and to reach his highest potential of life satisfaction (Masters, 2015). To the current study, health is the state of well-being of pregnant women during intrapartum and delivery, and how the equipment used during labor may affect the state of health of pregnant women and their babies.

- **Environment**

Virginia Henderson viewed the environment as the aggregate of all the external conditions and influences affecting the life and development of an organism (Masters, 2015). To the current study, environment was all potential hindrances to monitoring pregnant women in the context in which care was provided to pregnant women (during intrapartum and delivery), that were related to equipment used within that environment.

- **Nursing**

Virginia Henderson describes the unique function of the nurse as, to assist the individual, sick or well, in the performance of those activities contributing to health or recovery that an individual would perform unaided if he had the necessary strength, will, or knowledge (Fitzpatrick, 2018). To the current study, nursing

referred to all actions taken to contribute to health with the use of available operational equipment, in monitoring the progress of labor and delivery of pregnant women to achieve health.

1.4 PURPOSE OF THE STUDY

1.4.1 Aim of the study

The study aimed to investigate how the equipment used during intrapartum care and delivery could be a potential impediment to the optimal monitoring of pregnant women.

1.4.2 Objectives of the study

The objectives of the study were:

- To identify the potential impediment to optimal monitoring of pregnant women related to equipment used during intrapartum and delivery.
- To describe how the equipment used during intrapartum care and delivery could be a potential impediment to the optimal monitoring of pregnant women.
- To come up with recommendations to enhance optimal monitoring of pregnant women related to equipment that is used during intrapartum and delivery.

1.5 RESEARCH QUESTIONS

The following research questions guided the study:

- How is equipment likely to impede optimal intrapartum monitoring and delivery of pregnant women?
- Which equipment used during intrapartum care and delivery could be a potential impediment to the optimal monitoring of pregnant women in labour?
- What are the recommendations that can enhance optimal monitoring of pregnant women in labor related to equipment that is used during intrapartum and delivery?

1.6 OVERVIEW OF THE RESEARCH METHODOLOGY

The research methodology included in the study were research design, sampling, data collection, data analysis, reliability, Validation and objectivity, and bias. The quantitative research method was used in this study to obtain numerical data to equipment as a potential impediment to optimal intrapartum care and delivery of pregnant women.

1.6.1 Research design

A cross-sectional descriptive design was used to help the researcher describe outcomes of equipment as a potential barrier to optimal care of pregnant women during intrapartum and delivery used in the clinical setting of Sekhukhune district hospitals in Limpopo Province at a fixed point in time.

1.6.2 Population and sampling

The population of the study was 59 midwives working in the labour unit of the selected hospitals (Jane-Furse hospital, St Ritus hospital, Dilokong hospital and Mecklenburg hospital), in Sekhukhune District. Non-probability sampling was used to select midwives who will partake in the study. Total population sampling was used due to the small population, to enable the researcher to select and examine the entire population for a set of knowledge and skill.

1.6.3 Data collection

Data collection was conducted by using self-developed questionnaires which were self-administered to 59 midwives at the selected hospitals. All distributed questionnaires were completed and returned to the researcher.

1.6.4 Data analysis

The completed questionnaires were captured on the Microsoft Excel programme on the computer and analyzed using a Statistical Package for Social Science (SPSS) software program version 28.0, descriptive statistics were used to describe and facilitate the interpretation of the findings. Categorical variables (such as, Age, qualification and gender) were presented as numbers and percentages. Continued variables were presented as mean standard deviations.

Chi-square was used to determine relationship and differences between the two categorical variables on a nominal scale.

Reliability, Validity and Objectivity

The same structured questionnaires were given to all midwives to ensure reliability. Midwives were instructed to complete all questions on the questionnaires to ensure the validity of the study. The researcher distanced herself during the process of the completion of the questions to ensure the finding depends on the nature of the study is about than the beliefs and views of the researcher to ensure objectivity.

1.6.5 Bias

The researcher ensured that expected outcomes were not communicated to midwives, avoided the use of preferences when selecting a sample but rather used the total population sample, all respondents were given a chance to partake in the study equally, and further provided clear information to the respondent on how they will be participating in the study. Bias refers to any influence that produces a distortion in the results of the study or that strongly favours the outcome of a particular finding of a research study (Brink, et al., 2018).

- **Researcher subjectivity**

The researcher has ensured this by not communicating the expected outcomes to the midwives.

- **Sampling bias**

The researcher has ensured this by avoiding the use of preferences when selecting a sample, but rather tried to recruit all 59 midwives to partake in the study.

- **Midwives bias**

The midwives have been provided with clear information on how they will be participating in the research study.

1.7 ETHICAL CONSIDERATIONS

1.7.1 Ethical clearance and permission to conduct the study

Ethical clearance was obtained from Turfloop Research Ethics Committee (TREC). Permission to conduct the study was obtained from the Limpopo Department of Health, Hospital managers, and unit managers at the selected hospitals. Permission was also obtained from the midwives working in labor units.

1.7.2 Informed consent

Informed consent entails that the researcher provides adequate information about the proposed study, the prospective midwives understand the information that is being provided, and the prospective respondent decides based on the information provided whether to join the study (Kruger & Ndebele, 2014). The researcher gave adequate information to midwives, regarding the proposed research study. The midwives were briefed on how the research; study will be conducted. The researcher also allowed the respondent to decide on whether to take part in the study or not after information was provided about the study. In an agreement to join the research study, the respondent was given a Consent Form to sign prior to the data collection. The researcher informed midwives that, should they wish not to take part in the study, there will not be penalties or punishment. Lastly, the researcher has not attempted to use coercion toward midwives in situations where midwives refused to partake in the research study.

1.7.3 Confidentiality

Confidentiality is taken to mean that identifiable information about an individual collected during the process of research will not be disclosed and the identity of the research midwives will be protected throughout various processes designed to anonymize those (Wiles, 2013). In this study, confidentiality was ensured by not disclosing the information of the midwives to any other person, or by using code names rather than midwives' real names. Midwives were informed that their names or their identities will not be included in the study.

1.7.4 Privacy

Privacy involves avoiding undue intrusion into a person's personal affairs (Chadwick, Tadd & Gallagher, 2016). Privacy was ensured by not disclosing any gathered information to any unauthorized person without the respondent's permission and gathered information was kept in the researcher's personal computer. Furthermore, midwives were assured that the information provided will not be disclosed to an unauthorized person.

1.7.5 Principle of autonomy

Autonomy is concerned with respect for the person, their values, preferences, and choices (Scott, 2018). In this study, midwives were informed that they have the right to volunteer to participate or not and that they can terminate at any time they wish without the risk of any penalties.

1.7.6 Principle of justice

The ethical principle of justice requires fairness in dealing with others, meaning that in a research study the risks and benefits of the study be distributed, fairly among midwives (Schneider & Whitehead, 2013). In this study, the principle of justice was ensured by using a medium language of instruction and the selection of midwives fairly using the fishbowl technique.

1.7.7 Harm

Harm includes not only hazardous medical experiments but also any social research that might involve such things as discomfort, anxiety, harassment, invasion of privacy or demeaning or dehumanizing procedures (Ranjit, 2019). In this study, harm was ensured by obtaining informed consent from midwives, giving midwives a right to withdraw from the study, protecting midwives' identity and rights to confidentiality also midwives were not persuaded to participate in the study by force.

1.8 SIGNIFICANCE OF THE STUDY

Quality midwifery care practices have positive birth outcomes for pregnant women. The research study will give an inside on care given to pregnant women with the use of equipment during labor, therefore, will enhance the optimal care to pregnant women, and their fetus during intrapartum and delivery. The research will benefit midwives to render optimal care to pregnant women during intrapartum and delivery. Based on the findings from the data gathered, the research study will help the Department of Health to identify gaps/barriers to optimal care and see a need to ensure that a budget is made towards improving equipment used in the Labor Unit. The recommendations that will be developed in the research study may help policy makers to implement changes that may facilitate improving the equipment used to deliver optimal monitoring and delivery of pregnant women.

1.9 CONCLUSION

In conclusion, Chapter 1 discussed the overview of the study which included an introduction and background of the study, problem statement, theoretical framework, purpose of the study, research questions, objectives of the study, overview of the research methodology, ethical considerations related to the study and significance of the study. Chapter 2 will discuss the literature reviewed in this study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A literature review of the research report is an interpretative, organized, and written presentation of what the study's author has read (Aveyard, 2019). The purpose of conducting a literature review is to discover the most recent, and most relevant, information about a particular phenomenon (Burns, Gray, & Grove, 2020). Literature was obtained from articles on the internet such as science direct, google scholar, etc, electronic books, books from the library, and another electronic search engine (e-Resources) on the University of Limpopo online library. Literature obtained will be in the following sub-topics: a shortage of equipment, non-functional available equipment, and lastly infection control and prevention related to the study.

2.2 RATIONALE FOR LITERATURE REVIEW

The literature review aimed to help the researcher find current information related to the research study. The literature search will help to identify the gaps in the literature that led to the study and help evaluate the progress of knowledge in the research relevant to the study. Globally, there was less literature obtained, related to the study. From sub-Saharan Africa and local information, there was an indication that there is a shortage of equipment in Labor Unit related care given to pregnant women.

2.3 EQUIPMENT AS A POTENTIAL BARRIER TO OPTIMAL CARE

2.3.1 Shortage of Equipment

Indonesian midwives working in a government hospital perceived their difficulties in providing quality care for women as related to women's not only different needs and backgrounds but because of the shortage of midwives, availability of beds, and lack of necessary equipment. Indonesian midwives faced shortages of resources necessary to provide quality health services. Shortages of resources included basic equipment such as sterile sets, dopplers, and gloves. Moreover,

Shortages were due to insufficient supplies and lengthy repair time (Nagamatsu, Tanaka, Oka, Maruyama, Agus & Horiuchi, 2017). Shortage and a lack of basic equipment affects midwives care during labor to assess, diagnose and early prevention of complication from the pregnant women and their unborn baby, hence hinderers midwives to deliver good quality care to pregnant women and can result in substandard care practices.

According to Housseine, Punt, Mohamed, Said, Maaløe, Nicolaas, Zuithoff, Meguid, Franx, Diederick, Grobbee Browne and Rijken (2020), Fetal Heart Rate Monitoring (FHRM) was not optimally performed according to the locally tailored guidelines at Mnazi Mmoja Hospital in Zanzibar, Tanzania. For example, a baby's heart was monitored every 105 min on average instead of the recommended 60 min. Difficulties encountered with FHRM devices were their scarcity or misplacement, unavailability of gel for hand-held Dopplers and ultrasound, and non-functioning hand-held Dopplers (Housseine, et al., 2020). FHRM devices are essential in labor to monitor fetal heart rate (FHR), a lack or scarcity hinders maternity care practices to monitor FHR during labour, and for early detection of fetal complications, resulting in risks of long-term harm to the fetus and fresh stillbirths, therefor endangers lives of the fetus.

A study conducted in healthcare facilities in Zanzibar confirmed the shortage of equipment and added that some of the available equipment was worn out or outdated; and midwives indicated that they are still using the old pumping BP (blood pressure) machine that uses not less than 10 minutes to attend to one patient, instead of using a monitor that takes one minute to measure BP, PR, Temperature, oxygen saturation (Pembe, Sunguya, Mushy, Leshabari, Kiwango, Masaki & Mlunde, 2019). The use of worn-out and outdated equipment compromises midwifery care services to monitor women during labour. Advanced BP monitors are time efficient and can improve quality care to pregnant women in labour.

A study conducted in Tanzania reported that the government does not provide hospitals with enough equipment to cover most basic needs, midwives lacked everything, to more advanced material like digital monitors of blood pressure and fetal heart rate, and further indicated that there was low amount of equipment compared to women in the ward (Bremnes, Wiig, Abeid & Darj, 2018). The lack of equipment may results in missed opportunities to monitor, diagnose and prevent complications therefor may affect the health of pregnant women and their baby at birth.

A skilled birth attendant's ability to provide quality care was, also limited by a lack of equipment in the maternity unit (Munabi-Babigumira, Glenton, Lewin, Fretheim & Nabudere, 2017). Munabi-Babigumira et al (2017) alluded that a lack of equipment reduces skilled birth attendants' morale, increases their workload and infection risk, and make them less efficient in their work.

Operative Vaginal Delivery (OVD) refers to a delivery which uses instruments (forceps or vacuum device) to assist the mother in transitioning the foetus to extrauterine life (Sharma, 2016). The Operative Vaginal Delivery (OVD) help improve the maternal and foetal outcomes associated with the delayed second stage of labor despite its known benefits of OVD. Available data on the use of OVD in low-and middle-income countries show very low rates; mostly due to a lack of skilled healthcare workers and a shortage of equipment (Vannevel, Swanepoel & Pattinson, 2019). The availability of OVD in labor enhances care delivered to women, is time efficient, and often faster than the caesarean section in case of a delayed second stage of labor.

Midwives differ in their views of equipment and facilities needed to utilize alternative birth positions. Some midwives complained that there is a shortage of necessary equipment in assisting birthing women, such as a birthing stool, birthing ball, and a birthing pool in the labour ward (Musie, Peu & Bhana-Pema, 2019). The district hospital in South Africa found that there is a critical shortage of equipment and that the availability of equipment is of low quality that it was

concluded that for quality care to be provided, functional equipment needs to be provided (Mothiba, Skaal & Berggren, 2019).

Midwifery practitioners evidenced that essential equipment is scarce, namely, baumanometers and hemoglobin meters; doptone, CTG and NST as well as tracing paper; good working episiotomy scissors; and vaginal packs from a study conducted in hospitals in Limpopo province. This equipment is essential because they are, utilized for appropriate monitoring of maternal and fetal conditions (Thopola, 2016). Lack of basic equipment limit midwives to render optimal services to the pregnant women, hence results in suboptimal practices and may endangers health of pregnant women.

This is also the recommendation of DoH (2010) in the Saving Mothers Report, ensuring basic monitoring equipment such as baumanometers, pulse oximeters, haemoglobin meters, on-site HIV testing kits are available at all institutions conducting deliveries. If pregnant women not monitored efficiently, and effectively, it gives the picture of an inadequate clinical practice environment, suboptimal midwifery practice environment and challenged midwifery care in South Africa.

2.3.2 Non-Functional Available Equipment

Barriers to adequate Foetal Heart Rate Monitoring (FHRM) in a public hospital at Northern Uganda was due to a shortage of devices to monitor fetal heart rate was mainly monitored using a fetoscope but some midwives reported that the number of fetoscopes was not enough for the unit. Not all midwives had a watch for counting the FHR and the wall clock was sometimes out of sight. Other devices such as Doppler and electronic fetal monitors were sometimes available, but the gel was not always available. A knowledge gap in the use of the Doppler and fetal monitors was reported. Accessing the ultrasound scan when health workers needed to confirm fetal heartbeat was a challenge (Ayebare, Jonas, Ndeezi,

Nankunda, Hanson, Tumwine & Hjelmstedt, 2020). Barriers to FHR monitoring endanger the lives of fetus and midwives' care is compromised.

A study conducted in Ghana showed that there was other necessary (and essential) equipment available for checking vital signs at the health centers. These includes blood pressure apparatus, thermometer, and weighing scale—including a fetoscope and fetal doppler, but not all were in usable condition (Sumankuuro, Judith Crockett, & Wang, 2018). Thus, this poses a risk of impeding health care services rendered to pregnant women on intrapartum monitoring and delivery of a pregnant women.

Episiotomy scissors might be available although blunts not functioning well. This is, supported by the narrative data from learner midwives at Limpopo province hospitals in South Africa that revealed that episiotomy scissors were blunt, thus participants improvised and used a scalp blade to cut an episiotomy. This is an indication of suboptimal care that could cause medico-legal hazards. Vaginal packs were few.

This might influence unsterile per-vaginal examinations, thus hindering the good practice of performing sterile per-vaginal examinations procedurally as stipulated (Thopola & Lekhuleni, 2019). Blunt episiotomy scissor hinders quality care during delivery can endanger mother and midwives.

2.3.3 Infection Control and Prevention

Sterile equipment is essential in the birth room to ensure asepsis during delivery. Referral hospitals in Ouagadougou of Burkina Faso showed that sterile scissors were found in all maternity hospitals. However, although scalpels and sterile fields existed, they were not in enough quantity, and not all maternity hospitals had an autoclave machine (Same, Tougma, Outtarra, Yonaba, Poda, Yameogo, Kam, Traore, Sib, Thieba & Dao, 2020). Not having adequate equipment and a functional autoclave machine hinders infection control and prevention practices in labor. Financial, equipment and human resource constraints are obstacles to

the effective implementation of Infection Prevention and Control (IPC) in labor and delivery wards in the centers included in a study conducted at Nigeria (Buxton, Flynn, Oluyinka, Cumming, Mills, Shiras, Sara & Dreibelbis, 2019).

According to another study conducted in South Africa, Limpopo province midwives complained of the shortage of medical equipment and supplies is another factor that puts the training of midwives at risk, the study also showed that there was an absence of packs which made it difficult for healthcare practitioners to demonstrate sterile and other surgical procedures (Mawela, Maputle & Lebese, 2016). The absence of packs compromises care for pregnant women may put them at risk of infections hence which has an impact to the optimal care for pregnant women.

2.3 CONCLUSION

This chapter discussed a literature review regarding how equipment can be a potential impediment to optimal intrapartum monitoring of pregnant women during intrapartum and delivery. The aim of the literature review was to help the researcher find current information related to the research. The literature was discussed under the following topics shortage of equipment, non-functional available equipment, and lastly infection control and prevention. The next chapter will discuss the research methodology used in this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter outline research methodology of the study. The research methodology discussed includes research method, research design, data collection and ethical considerations related to data collection.

3.2 RESEARCH METHOD

A quantitative research method was used in this study to obtain numerical data to allow the researcher to produce objective data that will be presented through statistics and numeric data, pertaining to equipment used in the labor unit as a potential impediment to optimal intrapartum care and delivery of pregnant women. Quantitative research is a formal, objective, rigorous, systemic process for generating information about the world (Burns, Grove & Gray, 2014).

3.3 RESEARCH DESIGNS

According to Burns, Grove and Gray (2014), the research design is a blueprint for conducting research. In this study, a descriptive cross-sectional research design was used to identify and ascertain potential impediments to optimal intrapartum monitoring and delivery of pregnant women related to equipment utilized at the labor unit.

3.3.1 Cross-sectional design

A cross-sectional design is used to collect data at one point in time (Pilot & Beck, 2020). Cross-sectional surveys are research designs that provide the researcher with a picture of what might be occurring in sampling or population of people at a particular point at a time (Maltby, Williams, McGarry & Day, 2014). In this study a cross-sectional study was used to help the researcher describe outcomes of equipment as a potential barrier to optimal care of pregnant women during intrapartum and delivery used in the clinical setting of Sekhukhune district hospitals in a fixed point in time, Further-more cross-sectional design was to find

out the potential barriers to optimal intrapartum care and delivery of pregnant women that are related to equipment used in the labor ward.

3.4 RESEARCH SETTING

The study was conducted in selected district hospitals in Limpopo province, Sekhukhune District. Limpopo province is one of the nine provinces in South Africa. Sekhukhune District is divided into four sub-districts (Fetakgomo/Greater Tubatse, Makhuduthamaga, Ephraim Mogale, and lastly Elias Motswaledi). The researcher used four hospitals in the Sekhukhune district. Two of the selected hospitals are in the Makhuduthamaga Sub-District, whereas two other selected hospitals are in the Fetakgomo/Tubatse Sub-District. All the hospitals provide 24hours emergency services with midwives rendering 24hours emergency service.

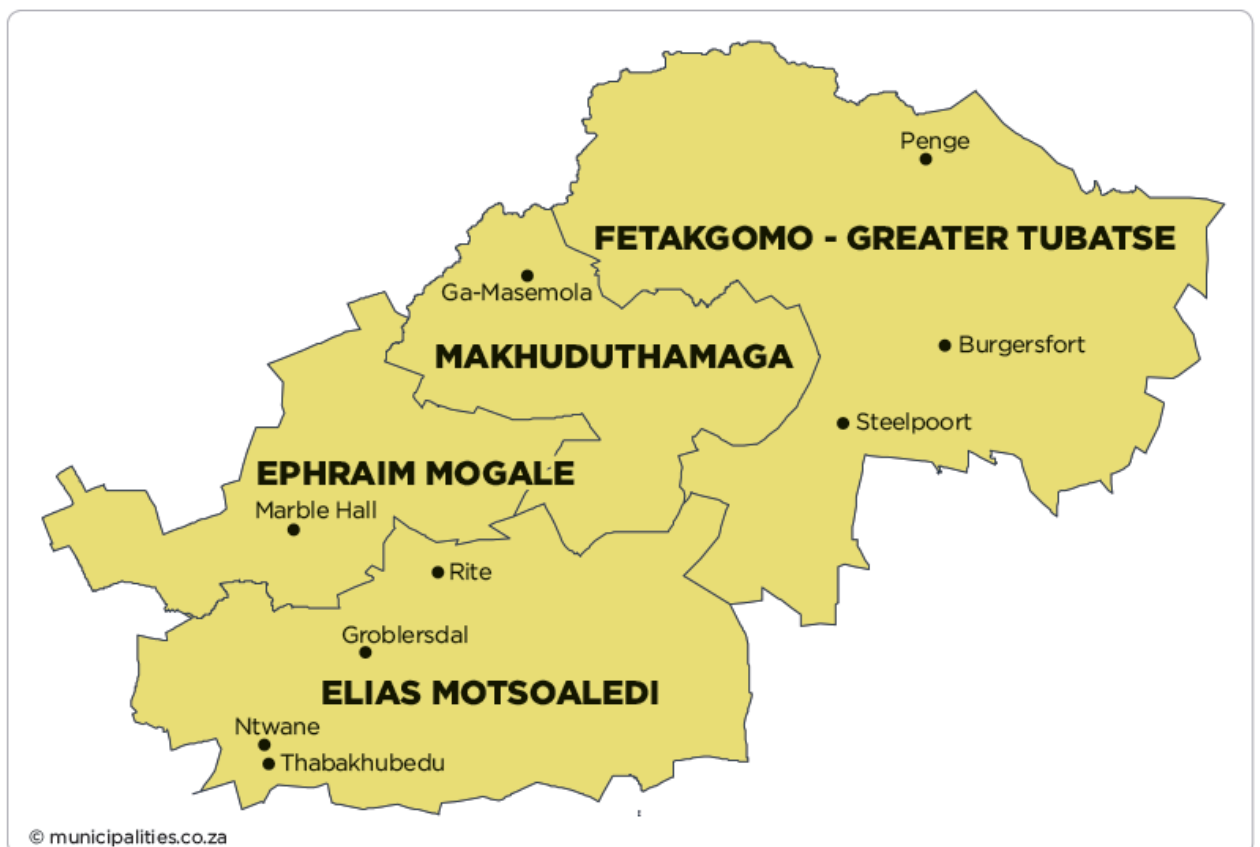


Figure 3: Sekhukhune District Map

Source: *at municipalities.co.za*

3.5 POPULATION

A population is a group of persons or objects who are the focus of the research (Burns, et al., 2014). The study population was 59 Midwives, only those working in the labor unit in hospitals of Sekhukhune District, who provide care to women during intrapartum and delivery of pregnant women.

3.6 SAMPLING

Sampling refers to the researcher's process of selecting the sample from the population to obtain information regarding a phenomenon in a way that represents the population (Brink, et al., 2018). In this study, non-probability sampling was used to help the researcher select midwives that are interested to take part in the study. A total population sampling was used to enable the researcher to select a sample and examine the sampled population for a set of knowledge the population has to the research study.

3.6.1. Ethical issues related to sample

The researcher has ensured this by avoiding the use of preferences when selecting a sample, but rather following the rules of purposive sampling to obtain the sample. The principle of informed consent was adhered to, regarding to the risks and discomfort, the midwives were allowed to make an informed decision to decide whether to participate in the research study for the benefit of the health care of pregnant women during intrapartum and delivery within labour unit.

3.6.2. Sampling technique

Total population sampling was used in the study to determine the sample of study. Total population sampling is a type of purposive sampling where the whole population of interest is studied (Glen, 2018). Most of the time, researchers use total population sampling method when the entire population is so small and well defined, and a fraction of which may no measure what is required and can eliminate any potential bias (Canonizado, 2020). In the study, the total population sampling was used due to the small number of the population of midwives to be

studied. The total number of the population, sample was 59 midwives who were enrolled in the study.

- **Inclusion criteria**

Inclusion criteria is defined as the main characteristics of the population (Houser, 2016). All midwives allocated in labour Unit at select Sekhukhune district hospitals who were on duty at times of data collection and had given their consent to participate in the study were eligible and included in the study. Those midwives were appropriate in that they monitor pregnant women during intrapartum and conducting deliveries of pregnant women.

- **Exclusion Criteria**

Exclusion criteria indicate subjects that are not suitable for the research question (Houser, 2016). Exclusion criteria were midwives in the maternity ward located at ANC, and postnatal care who are not concerned with monitoring women during intrapartum and do not conduct deliveries of women as their daily duty. Midwives on leave in labour unit and midwives who were not willing to participate in the study (Grove, Gray & Burns, 2014).

3.7 DATA COLLECTION

Data collection is the precise, systematic, gathering of information relevant to the research purpose or a specific objective, questions, or hypothesis of the study (Grove, et al., 2014).

3.7.1 Data collection approach and method

The researcher scheduled an appointment to meet with the Chief Executive Officers (CEO) of the hospitals and nurse managers of the selected hospitals prior data collection. During the meeting with the Chief Executive Officers (CEO) of the hospitals and nurse managers, the researcher presented the official document and requested permission to conduct the study. The meeting discussed the objectives and layout of the study, also how the study will benefit the quality of healthcare provided to pregnant women in labour unit. The research project was

discussed with the nurse managers of labor unit from the selected hospitals, to select a date for data collection which was communicated to the researcher. Midwives were met on the given appointment dates at their respective hospitals, most of the dates were on Wednesdays when all staff are likely to be present on duty due to the change in shifts.

3.7.2 Development and testing of the data collection instrument.

Data collection was done by using self-developed questionnaires to determine the equipment that may likely impede optimal intrapartum care and delivery of pregnant women in labor units of the selected hospital. The questionnaires were developed after an in-depth literature review. The final questionnaires were discussed with the supervisors and with assistance from a statistician. A pilot study was conducted with a convenience sample of 10 midwives in the different setting to assess direct feedback on the readability, difficulty of questions, and time taken to complete the questionnaires. Ten midwives who participated in the test were not included in the main study. The purpose of conducting a pre-test was to assist the researcher to get information, to assess and test the validity and reliability of the main study, to assess if the questionnaire answers the aims and objectives of the study, furthermore, to assess the appropriateness of questions; seek clarity, and refine questionnaires, should there be a need, prior to main data collection of the study.

3.7.3 Pilot study report

A pilot study is defined as a small-scale preliminary study conducted before any large-scale quantitative research to evaluate the potential for a future, full-scale project (Simkus, 2022). A pilot study was used in the study to help the researcher find out the feasibility of the study before the main study was going to be conducted. In this study, questionnaires were completed by 10 midwives in one of the settings in hospitals of Sekhukhune district and the results were as follows:

- Feedback on the readability of the questionnaire was good. Midwives were able to read and answer the questions.

- Comments on understanding the questions were also good, midwives were able to answer the questionnaire without leaving any blank spaces.
- There was a typing error that was highlighted by respondents, and it was corrected.
- The questionnaire took 15-20 minutes to be completed.

3.7.4 Characteristics of the data collection instrument

Data was collected by using self-developed questionnaires, which consisted of four (4) sections with 57 questions:

- *Section A:* Demographic data, which consists of 05 questions.
- *Section B:* The midwife, consists of 05 questions.
- *Section C:* Equipment used during intrapartum and delivery which consists of 34 questions; and
- *Section D:* Infection control and prevention consists of 13 questions.

3.7.5 Recruitment of midwives

The researcher met with the midwives in the labor unit, within the nurse's station, introduced herself to the midwives, addressed the purpose of meeting them, the topic of the research, the purpose of conducting the research, and the aims of conducting the research including the ethical considerations, particularly privacy, anonymity, and confidentiality. The researcher further explained how midwives' contribution to the study will benefit them in their work environment, the pregnant mothers, and the Department of Health. The researcher met respondents during the day and waited till evening for night duty staff. Lastly, researcher explained that it is completely voluntary to partake in the study.

3.7.6 Data collection process

After obtaining permission from the midwives to partake in the study. The researcher explained the instructions as to how the respondents are to fill and

complete the questionnaires. The questionnaires were self-administered to 59 midwives with assistance of the researcher in an empty and quiet cubicle to avoid disruptions of ward routines from different selected hospitals. The researcher utilized midwives' time when they did not have patients at that moment and their lunch breaks with their agreement to complete the questionnaire, completion of the questionnaire took 20-30minutes. The completed questionnaires were returned, and two questionnaires were spoiled because they were incomplete. The completed questionnaires were submitted to the supervisor, and 57 questionnaires were analysed.

3.8 ETHICAL CONSIDERATIONS RELATED TO DATA COLLECTION

Prior to administering questionnaires to midwives complete clear information about the research study was explained, including informed consent, anonymity, privacy, and confidentiality were also alluded. Respondents were not forced to partake in the study, consent forms were completed and the purpose of completing the consent form was explained. Midwives were allowed to make their decision to partake in the study.

- **Ethical clearance and permission to conduct the study**

Ethical clearance was obtained from Turfloop Research Ethics Committee (TREC) (see appendix A). Permission to conduct the study was obtained from Limpopo Department of Health (see appendix B), Den of selected district hospitals (see appendix C), selected hospital managers (see appendix D Jane Furse hospital and appendix E Dilokong hospital), two other hospital managers (of St Ritus hospital and Mecklenburg hospital) gave a verbal consent and unit managers at each maternity wards who also gave verbal consent to continue with data collection. Permission was also obtained from the individual midwives working in labour unit, consent forms were signed as to indicate they were agreeing to partake in the study.

- **Informed consent**

Informed consent entails that the researcher provides adequate information about the proposed study, the prospective midwives understand the information that is being, provided and the prospective respondent makes a decision based on information provided on whether or not to join the study (Kruger & Ndebele, 2014). The researcher gave adequate information to midwives, regarding the proposed research study. The midwives were briefed on how the research study will be conducted. The researcher also allowed the respondent to decide on whether to take part in the study or not after information was provided about the study. In an agreement to join the research study, respondent was given a consent form to sign prior the data collection. The researcher informed midwives that, should they wish not to take part in the study, there will not be penalties nor punishment. Lastly, the researcher has not attempted to use coercion towards midwives in situations where midwives refused to partake in the research study.

- **Confidentiality**

Confidentiality is taken to mean that identifiable information about an individual collected during the study will not be disclosed to unauthorised person including the identity of the research midwives which were protected throughout various processes designed to anonymise those (Wiles, 2013). In this study, confidentiality was ensured by not disclosing the information of the midwives to any other person, or by using code names rather than midwives' real names. Midwives were informed that their names or their identities will not be included in the study.

- **Privacy**

Privacy involves avoiding undue intrusion into a person's personal affairs (Chadwick, Tadd & Gallagher, 2016). Privacy was ensured by not disclosing any gathered information to any unauthorized person without the respondent permission and gathered information were kept in researcher's personal computer. Furthermore, midwives were assured that the information provided will not be disclosed to unauthorised person.

- **Principle of autonomy**

Autonomy is concerned with respect for person, their values, preferences, and choices (Scott, 2018). In this study, midwives were informed that they have the right to volunteer to participate or not and that they can terminate their participation in the study at any time they wish without the risk of any penalties.

- **Principle of justice**

The ethical principle of justice requires fairness in dealing with others, meaning that in a research study the risks and benefits of the study be distributed, fairly among midwives (Schneider & Whitehead, 2013). In this study, principle of justice was ensured by using medium language of instruction and selection of midwives fairly using the fishbowl technique.

- **Harm**

Harm includes not only hazardous medical experiment but also any social research that might involve such things as discomfort, anxiety, harassment, invasion of privacy or demeaning or dehumanising procedures (Ranjit, 2019). In this study, harm was ensured by obtaining informed consent from midwives, giving midwives a right to withdraw from the study, protecting respondent's identity and rights to confidentiality also midwives were not persuaded to participate in the study by force.

3.9 DATA ANALYSIS

Data analysis entails categorizing, ordering, manipulating, and summarising the data and describing them in meaningful terms (Brink, et al., 2018). In this research study, data from questionnaires were captured using the Microsoft Excel program on the computer and analyzed using Statistical Package for Social Science (SPSS) version 28.0 program with the assistance of a data statistician. Descriptive statistics was used in the study to describe and facilitate in the interpretation of the findings. Frequency and cross-tabulation analysis were used to summarise the data. Categorical variables are presented as numbers and

percentages. Continuous variables are presented as mean and standard deviation such as age. The chi-square was used to determine relationship and differences between the two categorical variables in a nominal scale. The Chi-square was used to measure whether the two variables are independent.

3.10 Reliability and validity of the study

3.10.1 Reliability

According to Grove et al. (2014), reliability is concerned with the consistency of the measurement, reliability-testing focus on equivalence, stability, and homogeneity. In this study, reliability was ensured by giving the same structured questionnaire to all midwives, a pilot study was conducted to ensure if midwives were able to answer the questionnaire.

3.10.2 Validity

Validity seeks to ascertain whether an instrument accurately measures what is supposed, to measure, given the context in which it is applied (Brink, et al., 2018). In this study, validity was ensured by instructing all midwives to complete all questions included on the questionnaire.

- **Content validity**

Content validity refers to the extent to which a data collection tool encompasses all aspects of the variable being measured (Harvey & Lucy, 2017). In this research study, content validity was ensured by using literature review data to develop questionnaires relevant to the study, and self-developed questionnaires were submitted to the supervisor and statistician to ensure all aspects of the variable are being measured.

- **Face validity**

Face validity refers to the extent to which a data collection tool appears to measure what it intends (Harvey & Lucy, 2017). In the research study, a pre-test was conducted on 10 midwives in Labour Unit to assess whether questionnaires

measure what they intend to measure. Ten midwives who participated in the test were not included in the main study.

3.11 CONCLUSION

This chapter discussed the research methodology of the study, research design, data collection, data analysis, and internal and external validity of the study. A quantitative research method was used in the study, in the setting of Sekhukhune district hospitals, with a total population of 59 midwives. Questionnaires were used to collect data from the midwives. Collected data was captured using Microsoft excel program, data analysis was done with the assistant of a data statistician. The following chapter will show presentation of the study results.

CHAPTER 4

PRESENTATION OF THE STUDY RESULTS

4.1 INTRODUCTION

This chapter will present the statistical quantitative results from the collected data and data management of the study. The results of the study will be presented according to the structure of the questionnaires, and the pie charts, graphs, and tables are used for visualization of the findings.

4.2 DATA MANAGEMENT AND ANALYSIS

Data collected in the study were captured using Microsoft excel, and 57 questionnaires were analysed using the SPSS version 28.0 program with the assistant of the data statistician. Data was analysed about the aim of the study which was to ascertain the potential impediment to optimal monitoring of pregnant women related to equipment used during intrapartum and delivery. Descriptive statistics were used to describe and in the interpretation of the data findings. The results of the study are presented in form of a pie chart, frequencies, and crosstabulations analysis to summarise the data. The results presented as percentages represent midwives who took part in the study, and (n) is the total number of the population sampled.

4.3 RESEARCH RESULTS

4.3.1 Section A: Demographic data

Demographic data in the study represented age, gender, qualification, years working in labour unit and work allocation (day or night duty).

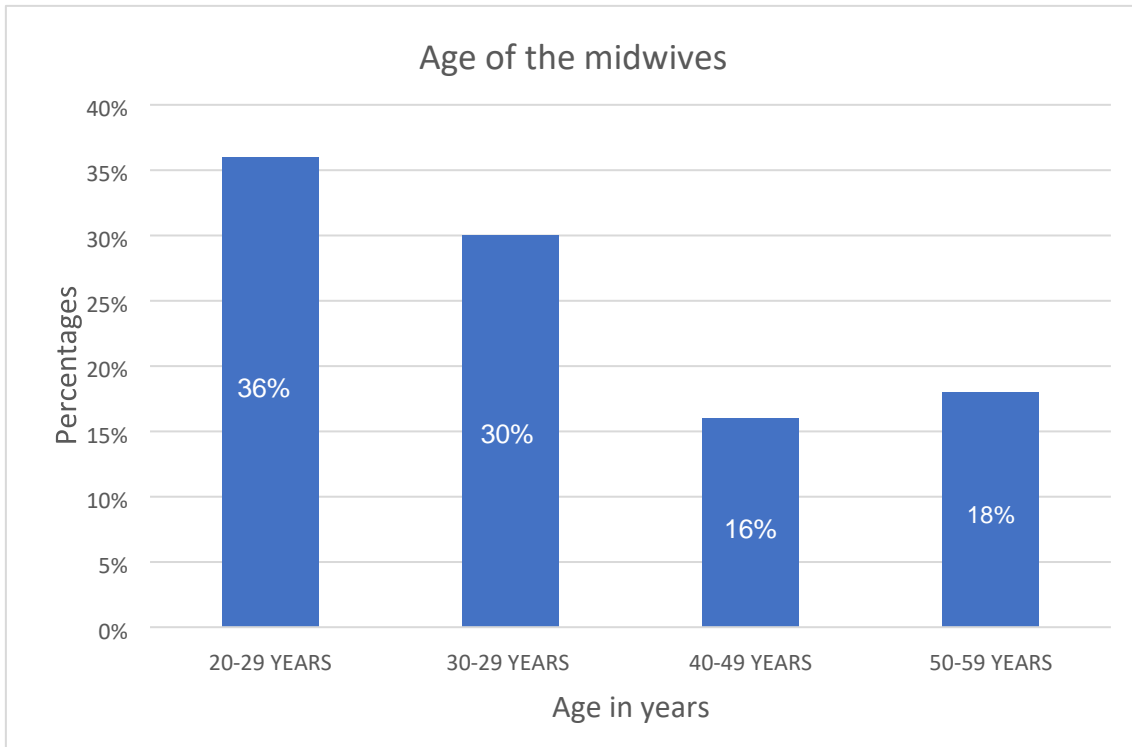


Figure 4.1: Age of the midwives N=57

Figure 4.1 represents age of midwives from age 20-29years with percentage of (37%), 30-39years with percentage of (30%), 40-49years with percentage of (16%) and 50-59years with percentage of (18%). Midwives' age ranged from 20 years to 59 years. Recent studies indicated that there is growth in the younger generation of midwives under 39 years due to the retirement of the older generation (Callander, Sidebotham, Lindsay & Gamble, 2021).

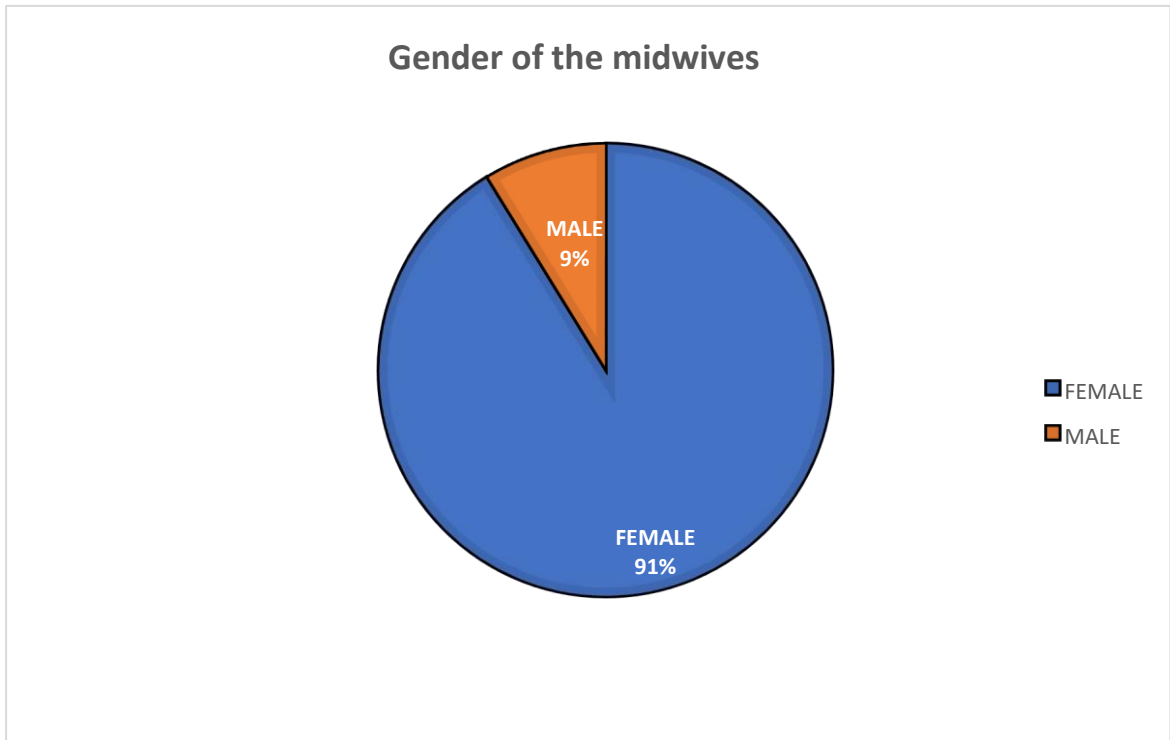


Figure 4.2: Gender

Results shown in figure 4.2 shows more females n= at 91% and lesser males at 9% that took part in the study. This shows that female midwives were dominant than male midwives. Midwifery is a profession that is composed almost entirely of women (Likis & King, 2020). Historically, midwifery care has remained a female domain, largely due to the commonly held belief that midwifery is about a female relationship (Madlala, Nxongo & Sibiya, 2020).

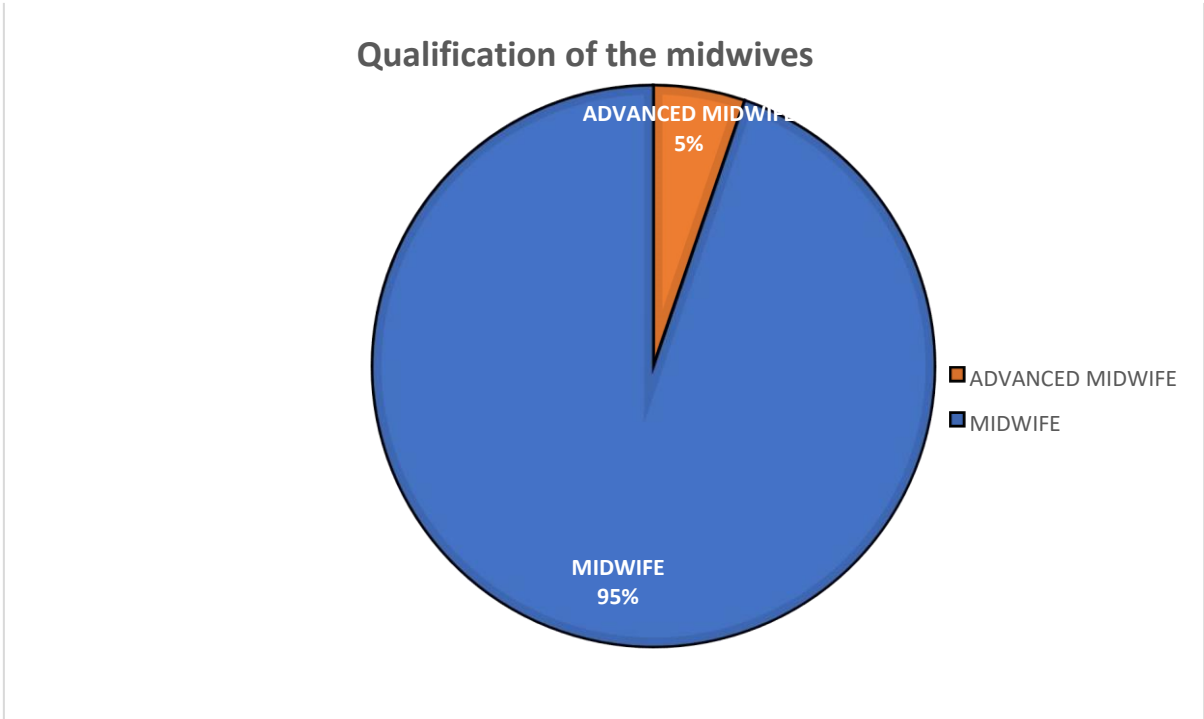


Figure 4.3: Show qualifications of the midwives

Figure 4.3 indicates that 95% of midwives were midwives and only 5% were advanced midwives who took part in the study. This indicates that most midwives did not have advanced midwifery qualification. This may be due to the new entry of midwives and that there are fewer trained advanced midwives where the study was conducted. The quality of midwifery care in the study was based on the equipment used to deliver midwifery services. The number of qualified midwives did not have an impact on the study as both advanced midwives and registered midwives were using the same equipment and encountered similar potential barriers to delivering quality midwifery care to pregnant women with the equipment they use. There was no reliable literature found to support the above research findings.

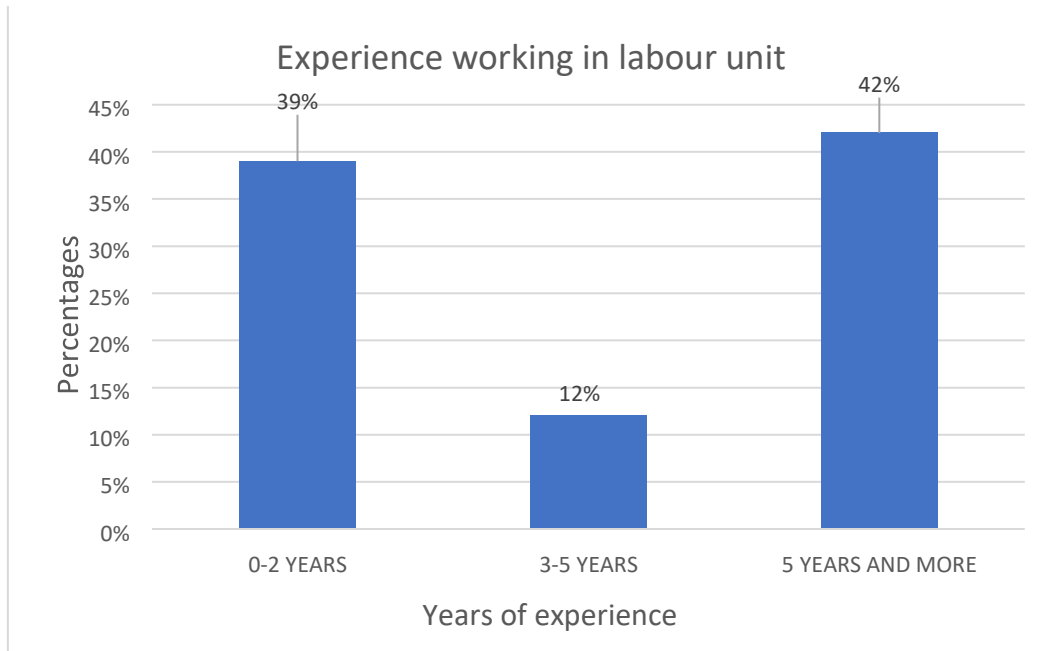


Figure 4.4: Shows midwives' experiences of working in labour unit.

Figure 4.4 shows midwives' experience of working in labor unit, 5 years and more 5years and more are 49%, 0-2 years shows 39%, and 3-5years shows 12%. The experience of midwives in the labour unit had no impact on midwifery service related to the study, however, barriers to quality of care were assessed on the equipment used to achieve optimal intrapartum and delivery care to pregnant women. Researcher found no relatable literature to support the above research findings.

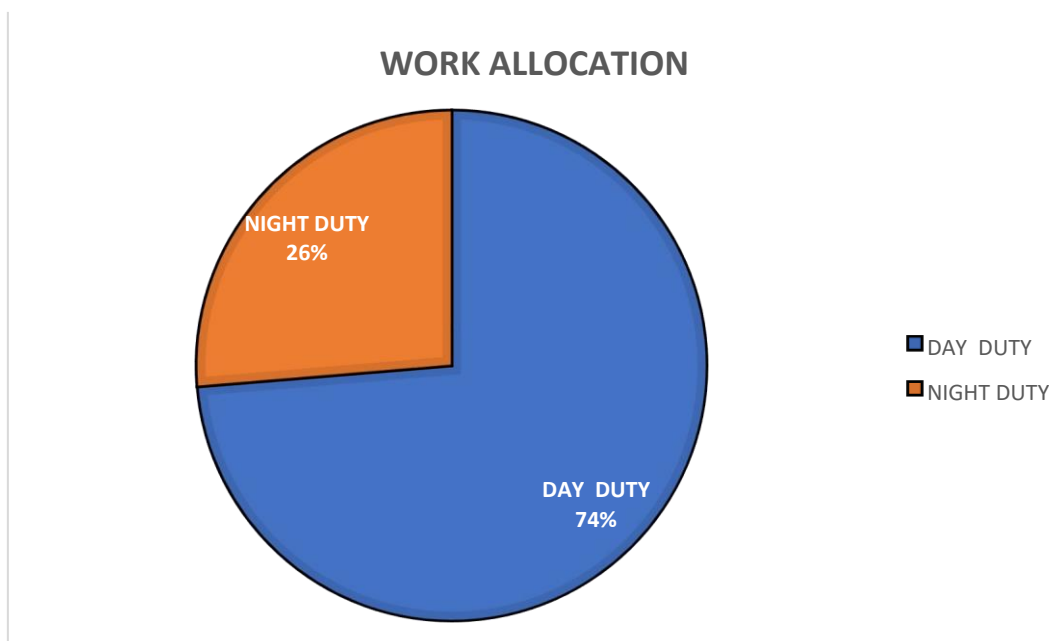


Figure 4.5: Work allocation (day or night duty)

Figure 4.5 shows the presentation of midwives working in the labour ward, for day and night duty. 74% midwives working day duty took part in the study and only 26% of midwives working in night duty took part in the study. This shows that there were more midwives were allocated in day duty compared to night duty. This is often due to having more patient admissions during the day and labor ward day routines during the day hence more staff allocated for day duty. Literature related to the above finding was not found.

4.3.2 Section B: The Midwife role regarding the use of equipment

Table 4.7: The midwife role regarding the use of equipment

Midwife	SA	A	D	SD	U
1. As a midwife, I know my role regarding the use of equipment when attending a pregnant woman during labour.	45 (76%)	12 (24%)	0 (0%)	0 (0%)	0 (0%)
2. As a midwife, I experience barrier in administration of care to pregnant women, related to use of equipment.	11 (19%)	28 (49)	8 (14)	9 (16%)	1 (2%)
3. Equipment used need improvement in my unit (labour ward).	32 (56%)	14 (25%)	4 (7%)	7 (12%)	0 (0%)

4. Reported non-functional equipment are attended to promptly.	10 (17%)	6 (11%)	19 (33%)	21 (37%)	1 (2%)
5. There is quality of care practices to pregnant women with the use of available equipment in the unit.	16 (28%)	26 (46%)	10 (17%)	4 (7%)	1 (2%)

- ***As a midwife, I know my role regarding the use of equipment when attending to a pregnant woman during labor.***

Table 4.7 shows 100% (n=57) midwives agreed that they know their role regarding the use of equipment when attending to a pregnant woman during labor. Midwives have a role in implementing assistance and monitoring maternal and child health (Indruastuti, Margawati, Rachma & Tahiruddin, 2021). However other studies showed that midwives are faced with difficulties to execute their roles to render quality midwifery care, this is evidenced when a lack of resources and equipment to perform their daily work duties results in a significant challenge (Bogren, Grahn, Kabor, & Berg, 2020).

- ***As a midwife, I experience a barrier in the administration of care to pregnant women, related to the use of equipment.***

Table 4.7 shows that 68%(n=39) of midwives agree that they experience barriers in the administration of care to pregnant women, related to the use of equipment, however, 30%(n=17) of midwives disagree that they experience a barrier in the administration of care to pregnant women, related to use of the equipment and only 2%(n=1) midwives uncertain that they experience a barrier in the administration of care to pregnant women, related to use of equipment. Similarly with the study, midwives in Ghana showed that in the face of lack of equipment and supplies, they would be driven by their motivation to improvise by borrowing and sharing equipment or alternative used equipment that can produce positive results (Ismaila, Bayes & Geraghty, 2021). Moreover, midwives in south Africa also showed that they experienced a shortage of necessary equipment in assisting birthing women (Musie, Peu & Bhana-Pema, 2019). This lack and

shortage of equipment create a barrier to delivering quality care to pregnant women in labor.

- ***The equipment used need improvement in my unit (labour ward).***

Table 4.7 shows the majority of midwives agree 81%(n=46) that the equipment used need improvement in their unit, with only 19%(n=11) midwives disagreeing that the equipment used need improvement in their unit (labor ward). This is supported by a study conducted in the Ethiopian region which showed that the quality of equipment is considered a key element in efforts to better the health outcome and improves service delivery (Hugaman, Singh & Abate, 2019). This raises a concern that midwives in South Africa have been involved in an increasing number of medico-legal cases reflecting concerns about the nature and quality of care some are due to medical negligence and poor intrapartum management in public facilities (Bloom, 2019).

- ***Reported non-functional equipment is attended to promptly.***

Table .4.7 shows the majority of midwives 70%(n=40) disagree that reported non-functional equipment are attended to promptly, with only 28%(n=16) of midwives agree that reported non-functional equipment are attended to promptly, lastly 2%(n=1) of midwives were uncertain that reported non-functional equipment are attended to promptly. In line with the study, the maintenance of basic equipment was a challenge in the eastern cape district hospital, study showed that they had a deficiency in vital equipment and for maintenance of equipment they used other government units however encountered barriers that the response will be delayed or no response at all (Mathole, Lembani, Jackson, Zarowsky, Bilmakers & Sanders, 2018). This can negatively affect the quality of equipment used and hence can hinder midwives' practice of optimum care for pregnant women in labor.

- ***There is the quality care practices for pregnant women with the use of available equipment in the unit.***

Table 4.7 show majority of midwives 74%(n=42) agree that there is the quality care practices to pregnant women with the use of available equipment in the unit.

However, 24%(n=14) midwives disagree that there is the quality care practices to pregnant women with the use of available equipment in the unit and only 2%(n=1) were uncertain that there is the quality of care practices to pregnant women with the use of available equipment in the unit. Studies show that midwives use their efforts to ensure the quality care services is given to pregnant women such as improvising when there is a lack of equipment and borrowing equipment to ensure care is given to pregnant women. Empirical evidence shows that when midwifery care is provided by educated, trained, regulated, licensed midwives, it is associated with improved quality of care (Adataru, Amooba & Afaya, 2021). Even so, a study in Limpopo province showed to be having a high rate of Institutional maternal mortality rate (IMMR) reason shown to be a lack of access to quality care from peripheral hospitals and inadequately resourced as far as personnel, and equipment to manage maternity cases (Ntuli, Mogale, Hyera & Naidoo, 2022).

4.3.3 Section C: Equipment used during intrapartum and delivery.

Table 4.8: The blood pressure monitor

Blood Pressure (BP) monitoring	SA	A	D	SD	U
1. BP machine is available.	35 (61%)	21 (37%)	0 (0%)	1 (2%)	0 (0%)
2. BP Machine is fully functional (give correct readings).	28 (49%)	25 (43%)	2 (4%)	0 (0%)	2 (4%)
3. BP machines available are adequate to monitor all women during intrapartum and labor.	16 (28%)	5 (9%)	21 (37%)	14 (24%)	1 (2%)
4. Routine maintenance/service of BP machines is done.	14 (24%)	13 (23%)	18 (32%)	10 (17%)	2 (4%)
5. Only one BP machine is used for all pregnant women in the unit.	24 (41%)	10 (18%)	17 (29%)	6 (12%)	0 (0%)

- ***BP machine is available.***

Table 4.8 shows 98%(n=56) of midwives agree that a BP machine is available, and only 2%(n=1) of midwives disagree that a BP machine is available. BP Machines are essential during labour to monitor pregnant women's blood pressure, and diagnoses of hypertension-related disorders. However, a study conducted in Limpopo province showed that there was a shortage of basic essential equipment such as blood pressure machines which made the implementation of maternal guidelines ineffective (Ramavhoya, Maputle, Lebesa, Ramathuba, & Netshukweta, 2019).

- ***BP machine is fully functional (give correct readings).***

Table 4.8 shows that 92%(n=53) of midwives agree that BP Machine is fully functional, however 4% (n=2) of midwives disagree that BP Machine is fully functional and 4%(n=2) uncertain that BP machine is fully functional (give correct readings). The accurate measurement of blood pressure in pregnancy is essential to guide medical decision-making that may affect both the mother and fetus (Bello, Wolley and Shimbo, 2018). Operational BP machines are vital in labor for BP monitoring of pregnant women to promote health and prevent complications of hypertension-related conditions.

- ***BP machines available are adequate to monitor all women during intrapartum and labor.***

Table 4.8 shows that 61%(n=35) of midwives disagree that BP machines available are adequate to monitor all women during intrapartum and labor, where as 37% (n=21) of midwives agreed that BP machines available are adequate to monitor all women during intrapartum and labor, and only 2%(n=1%) midwives uncertain that BP machines available are adequate to monitor all women during intrapartum and labor. This was supported by a study conducted by Ramavhoya, Maputle, Ramathuba, and Netshikweta, (2020) in Limpopo province, South Africa where most respondents disagreed that basic equipment such as BP machines are always available. Another study conducted in Tanzania by Bremnes, Wiig, and Abeid, (2018) where it indicated that midwives lacked essential supplies for more advanced materials like digital monitors of blood pressure.

- ***Routine maintenance/service of BP machines are done.***

Table 4.8 shows 49%(n=28) of midwives disagree that routine maintenance/service of BP machines are done, followed by 47%(n=27) of midwives agree that routine maintenance/service of BP machines are done, and 2%(n=1) midwives uncertain that routine maintenance/service of BP machines are done. Standard protocol for measuring blood pressure noted that machines should be regularly calibrated, and results should be monitored by a medical manager (Moodley & Soma-Pillay, 2019). Calibration of BP machine allows them to measure if data is accurate and reliable. Additionally, aneroid devices are used to commonly for BP measurement, but they may be inaccurate and need to be regularly calibrated (Brown, Magee & Kenny, 2018).

- ***Only one BP machine is used for all pregnant women in the unit.***

Table 4.8 shows 59%(n=34) of midwives agree that only one BP machine is used for all pregnant women in the unit. However, 41%(n=23) of midwives disagree that only one BP machine is used for all pregnant women in the unit. Close and timely monitoring of maternal blood pressure during labor is considered a good obstetrical practice that could save lives (Agena & Modiba, 2021). Though in resource variable settings, diagnosis may be limited by inadequate access to blood pressure machines, the majority of health facilities in Toronto district Uganda reported at least one working BP machine was used (Besigye, Okuuny & Armstrong-Hough, 2021). Using one BP machine may impede the monitoring of pregnant women’s BP at the correct time and miss opportunities to diagnose BP-related conditions early.

2. Table 4.9: The cardiotocography monitor.

Cardiotocography (CTG) monitoring	SA	A	D	SD	U
1. CTG Machine is available.	39 (68%)	18 (32%)	0 (0%)	0 (0%)	0 (0%)

2. CTG machine is functioning well.	27 (47%)	22 (38)	5 (9%)	2 (4%)	1 (2%)
3. CTG paper rolls are always available.	31 (54%)	17 (30%)	7 (12%)	2 (4%)	0 (0%)
4. I know the benefits of using CTG during intrapartum.	39 (68%)	18 (32%)	0 (0%)	0 (0%)	0 (0%)
5. I can interpret the CTG results.	25 (44%)	20 (35%)	7 (12%)	2 (4%)	3 (5%)

- ***CTG Machine is available.***

Table 4.9 shows 100% (n=57) midwives agree that CTG Machine is available. CTG is used to monitor fetal heart rate, and mother's contractions (Willacy & Tidy, 2021). The basic features of the CTG are the baseline FHR, the baseline variability, acceleration, deceleration, and the tocogram/uterine contraction, and a combination of these basic features gives a diagnosis when it is performed (Enabudoso, 2021). CTG availability is vital to monitor fetal well-being during intrapartum.

- ***CTG machine is functioning well.***

Table 4.9 Shows 85% (n=29) of midwives agree that CTG machine is functioning well. However, 13% (n=7) of midwives disagree that the CTG machine is functioning well, and 2%(n=1) of midwives were uncertain that the CTG machine is functioning well. A functional CTG facilitates the accurate readings of FHR and uterine contractions, also monitoring of fetal wellbeing during intrapartum. There were limited research findings to support the results.

- ***CTG paper rolls are always available.***

Table 4.9 shows 84% (n=68) of midwives agree that CTG paper rolls are always available. However, 16%(n=9) of midwives disagree that CTG paper rolls are always available. Without CTG paper, getting readings on CTG monitor may be

hindered and hence may impede assessing fetal emergencies and there was limited research found to support the results.

- ***I know the benefits of using CTG during intrapartum.***

Table 4.9 shows that 100% (n=57) of midwives agree that they know the benefits of using CTG during intrapartum. On utilization of CTG machines midwives should be constantly provided with post-basic midwifery courses to improve their knowledge, and in-service training programs, as well as a workshop, should be frequently conducted (Mazwi, 2020). Knowledge of use of CTG machines enhances midwifery care and interventions during intrapartum.

- ***I can interpret the CTG results.***

Table 4.9 shows that 79% (n=45) of midwives agree that they can interpret the CTG results, however 16%(n=9) of midwives disagree that they can interpret the CTG results, and 5% (n=3) of midwives were uncertain that they can interpret the CTG results. Midwives are the constant care givers of laboring women, it is fundamental that they have adequate knowledge of CTG to interpret cardiocotographs accurately therefore this knowledge is necessary for critical decision-making during intrapartum monitoring activities (Sandiwe, Ntshepiseng & Maduna, 2019).

Table 4.10: Fetal heart rate monitoring

Foetal Heart Rate (FHR) monitoring	SA	A	D	SD	U
1. FHR monitor is available.	28 (49%)	26 (45%)	1 (2%)	1 (2%)	1 (2%)
2. Equipment for monitoring FHR gives accurate readings.	20 (35%)	29 (51%)	3 (5%)	2 (4%)	3 (5)
3. There is a need to improve the equipment used for monitoring FHR.	24 (42%)	17 (29%)	6 (11%)	9 (16%)	1 (2%)

- ***FHR monitor is available.***

Table 4.10 shows 94% (n= 54) of midwives agree FHR monitor is available, with 4%(n=2) of midwives disagreeing that FHR monitor is available and 2%(n=1) midwives of midwives were uncertain that FHR monitor is available. To prevent intrapartum asphyxia, early detection of fetal responses to fetal hypoxemia, as indicated by FHR abnormalities, is crucial (Mdoa, Ersdal & Mduma, 2018). The availability of FHR monitor thereof helps evaluate fetal well-being and early detection of fetal complications.

- ***Equipment for monitoring FHR gives accurate readings.***

Table 4.10 shows 86%(n=49) of midwives agree that equipment for monitoring FHR gives accurate readings. However, 9%(n=5) of midwives disagree that equipment for monitoring FHR gives accurate readings and 5%(n=3) of midwives were uncertain that equipment for monitoring FHR gives accurate readings. FHR Monitoring is an essential intrapartum practice to detect signs of hypoxemia and acidosis (Masuda, Ferolin, Masuda, Smith & Mutsie, 2020). The absence of functional FHR monitoring can impede the optimal monitoring of pregnant women during intrapartum and may endanger the lives of the mothers and their babies.

- ***There is a need to improve the equipment used for monitoring FHR.***

Table 4.10 shows 71%(n=41) of midwives agree there is a need to improve equipment used for monitoring FHR. However, 27%(n=15) of midwives disagree that there is a need to improve equipment used for monitoring FHR, and 2%(n=1) of midwives uncertain that there is a need to improve equipment used for monitoring FHR. This is supported by a study conducted in Zanzibar indicating that the difficulties encountered in fetal heart rate monitor devices were their scarcity, misplacement, and unavailability of gel for hand-held dopplers and ultrasound and non-functional hand-held dopplers (Houssein, Punt & Mohamed, 2019). Another study conducted in Tanzania indicated that fetal stethoscope is mainly used for intermittent monitoring of FHR during labor in low-income countries, where perinatal mortality is still high, furthermore that hand-held doppler is rarely available and are dependent on batteries and electricity (Kamala, Kidonto & Wangwa, 2018)

Table 4.12 Equipment during delivery

During delivery	SA	A	D	SD	U
1. The bed capacity is enough to meet the patient demand.	11 (19%)	10 (18%)	16 (28%)	20 (35%)	0 (0%)
2. Examination lights are available in each delivery room.	12 (21%)	18 (32%)	14 (24%)	13 (23%)	0 (0%)
3. Examination lights are functioning well in each delivery room.	12 (21%)	11 (19%)	18 (32%)	16 (28%)	0 (0%)
4. Overhead radiant warmer is available in each delivery room.	10 (18%)	11 (19%)	21 (37%)	15 (26%)	0 (0%)
5. Overhead radiant warmer are fully functional in each delivery room.	11 (19%)	8 (14%)	29 (51%)	9 (16%)	0 (0%)
6. Overhead radiant warmer are adequate to meet the new-borns demand.	10 (18%)	9 (16%)	25 (44%)	13 (22%)	0 (0%)
7. Examination scales for new-born are available in each delivery room.	14 (24%)	12 (21%)	18 (31%)	13 (24%)	0 (0%)
8. Examination scales for new-born are functioning well.	18 (31%)	31 (54%)	5 (9%)	3 (6%)	0 (0%)

- ***The bed capacity is enough to meet the patient demand.***

Table 4.12 shows 63%(n=36) of respondent disagree that the bed capacity is enough to meet the patient demand. However, 37% (n=21) of respondent agree that the bed capacity is enough to meet the patient demand. This is supported by a study conducted in Ghana which indicated that there was inadequate infrastructure (lack of beds and physical space) to render quality care, they further bemoaned that the chronic lack of beds affects the quality of midwifery care because women must be laid on mattresses on the floor (Adatar, Amooba & Afaya, 2021). Another study in Ghana showed that some of the equipment in the health facilities were found to be outdated and inadequate, particularly beds for childbirth and postpartum care (Dalinjong, Wang, & Homer, 2018). All study hospitals in southern Ethiopian experienced patient numbers that exceeded bed

capacity (Asefa, McPake & Langer, 2020). Inadequate bed capacity to meet patient demand hinders care of pregnant women in labour.

Other studies showed that maternity wards are overcrowded, and some beneficiaries were forced to leave the hospital early to make a room for others or even sleep on the floor due to lack of beds (Gitobu, Gichangi & Mwanda, 2018). Lack of sufficient bed capacity and private birth space in maternity ward was an issue reported also in Tago and South Sudan (Dahab & Sekellariou, 2020). Lack of adequate beds in labour affect the quality of care to pregnant women, compromising their comfort, and may impede quality of management given to pregnant women in labour.

- ***Examination lights are available in each delivery room.***

Table 4.12 shows that 53%(n=30) of midwives agree examination lights are available in each delivery room, however, 47%(n=27) of midwives disagree that examination lights are available in each delivery room. Lack of reliable electricity and light in maternity facilities may contribute to poor quality of both routine and emergency obstetric care, reducing health care worker morale (Rokicki, Mwesigwe, & Schmucker, 2018). In contrast with study results, a study conducted in maternity units of 17 low- and middle-income countries in Africa stated that examination lights, were somewhat less available (Kanyangarara, Chou, Creanga & Walker, 2018).

- ***Examination lights are functioning well in each delivery room.***

Table 4.12 shows that 60% (n=34) of midwives disagree that examination lights are functioning well in each delivery room. However, 40% (n=23) of midwives agree that examination lights are functioning well in each delivery room. This is supported by a study conducted in Ghana which indicated that midwives do not have a source of light, when conducting delivery, they use a lamp also a torchlight when there is a perineal tear (Sumankuuro, Crockett & Wang, 2018). The basic functions of light are to provide visibility (Rodrigues & Shimo, 2019). Non-functional examination lights may impede examinations conducted there by affecting the quality of management given to pregnant women.

- ***An overhead radiant warmer is available in each delivery room.***

Table 4.12 shows that 63%(n=36) disagree that an overhead radiant warmer is available in each delivery room however 37%(n=21) midwives agree that an overhead radiant warmer is available in each delivery room. Nowadays death of newborns due to hypothermia is one of the vital factors, to overcome the problem infant radiant warmer has been used in hospitals to help to prevent excessive heat loss of the baby by maintaining a proper temperature (Dey & Deb, 2021). The unavailability of radiant warmer puts babies at risk of hypothermia.

- ***The overhead radiant warmer is fully functional in each delivery room.***

Table 4.12 shows 67%(n=38) midwives disagree that overhead radiant warmer are fully functional in each delivery room. However, 33%(n=19) midwives agree that overhead radiant warmer is fully functional in each delivery room. There was limited studied to support this data. Fully functional overhead radiant warmer are vital to keep baby warm, minimises risks of hypothermia in newborns.

- ***Overhead radiant warmer are adequate to meet the new-borns demand.***

Table 4.12 shows 66%(n=38) midwives disagree that overhead radiant warmer are adequate to meet the new-borns demand, however 34%(n=19) respondent agree that overhead radiant warmer are adequate to meet the new-borns demand. Inadequate overhead radiant warmer may impede management of the neonate post-delivery.

- ***Examination scales for new-born are available in each delivery room.***

Table 4.12 shows 55%(n=31) respondent disagree that examination scales for new-born are available in each delivery room, however 45%(n=26) midwives agree that examination scales for new-born are available in each delivery room. A lack of sufficient and suitable weighing devices was described as a major impediment to birthweight measurement, most midwives in a study conducted in Kenya expressed that there was no scale in their units, even when scale was

available it was sometimes in poor conditions, device was described as malfunctioning or giving imprecise measurements (Gladstone, Salim & Ogilo, 2021).

- **Examination scales for new-born are functioning well.**

Table 4.12 shows 85%(n=49) midwives agree that examination scales for newborn are functioning well, however 15%(n=8) midwives disagree that examination scales for new-born are functioning well. A study conducted in Tanzania indicated that a high-quality birthweight information requires functioning, calibrated, accurate weighing scales, also that more accurate birth weight data are vitally important for all babies and specifically to track progress in preventing and improving immediate and long-term care for low birthweight children (Gladstone, Salim & Ogilo, 2021).

Table 4.13 The delivery pack

The delivery pack	SA	A	D	SD	U
1. Delivery packs are available.	37 (63%)	20 (37%)	0 (0%)	0 (0%)	0 (0%)
2. Delivery packs are always complete inside. Delivery packs are available.	20 (35%)	15 (26%)	15 (26%)	7 (13%)	0 (0%)
3. Arterial forceps are available in each delivery pack.	24 (42%)	29 (51%)	3 (5%)	1 (2%)	0 (0%)
4. Arterial forceps in each delivery packs are functioning well.	20 (35%)	21 (38%)	11 (19%)	3 (5%)	2 (3%)
5. Needle holder is available in all delivery packs.	21 (37%)	22 (38%)	12 (21%)	2 (4%)	0 (0%)
6. Needle holder in each delivery packs is functioning well.	10 (17%)	18 (32%)	23 (40%)	5 (9%)	1 (2%)
7. Some midwives do not use needle holders but their own hand when suturing tears and episiotomy cuts.	5 (9%)	14 (25%)	17 (29%)	20 (35%)	1 (2%)
8. Umbilical cord scissor is available in each delivery pack.	19 (34%)	27 (49%)	11 (19%)	0 (0%)	0 (0%)

9. Some umbilical cord Scissors are blunt (cannot cut).	22 (38%)	26 (46%)	4 (7%)	5 (9%)	0 (0%)
10. I utilise a razor blade for cutting umbilical cord in absence of functional umbilical cord scissor.	21 (37%)	29 (50%)	1 (2%)	6 (11%)	0 (0%)
11. Episiotomy scissors are available in each delivery pack.	15 (26%)	29 (51%)	9 (16%)	4 (7%)	0 (0%)
12. Some episiotomy scissors are blunt.	33 (57%)	18 (32%)	1 (2%)	5 (9%)	0 (0%)
13. Razor blade is utilised to perform episiotomy in the absence of functional episiotomy scissor.	20 (35%)	23 (41%)	3 (5%)	11 (19%)	0 (0%)

- ***Delivery packs are available.***

Table 4.13 shows 100%(n=57) midwives agree that delivery packs are available. Pre-prepared delivery packs necessitate several full sets of equipment (de Barra, Gon & Penn-Kekana, 2021).

- ***Delivery packs are always complete inside.***

Table 4.13 shows 60%(n=35) of midwives agree that delivery packs are always complete inside, and 40%(n=22) of midwives disagree that delivery packs are always complete inside. However, a study conducted in Zanzibar midwives noted that delivery packs are often incomplete also listed equipment shortage as reason delivery packs were not always available (de Barra, Gon & Penn-Kekana, 2021). Full set of delivery packs enhances good quality care during deliver.

- ***Arterial forceps are available in each delivery pack.***

Table 4.13 shows 93%(n=53) of midwives agree that arterial forceps are available in each delivery pack and 7%(n=4) of midwives disagree that arterial forceps are available in each delivery pack. In contrast with the study results, the study in Zanzibar indicated that the least found items in the delivery set pean artery forceps which were found in only 13.7% and 37.3% of all the facilities in Zanzibar, and the shortage of equipment affected lower-level facilities more than higher

level facilities (Pembe, Sunguya, Mushy, Leshabari, Kiwango, Masaki & Mlunde, 2019).

- **Arterial forceps in each delivery packs are functioning well.**

Table 4.13 shows 73%(n=41) of midwives agree that arterial forceps in each delivery packs are functioning well, 24%(n=14) of midwives disagree that arterial forceps in each delivery packs are functioning well and 3%(n=2) of midwives uncertain that arterial forceps in each delivery packs are functioning well. Functional arterial forceps necessitates safe use and enhance midwifery care with the use of the arterial forceps. There are limited studies done to support the study findings.

- ***Needle holder is available in all delivery packs.***

Table 4.13 shows 75%(n=41) of midwives agree needle holder is available in all delivery packs, however 25%(n=14) of midwives disagree that needle holder is available in all delivery packs. Needle holders facilitates in holding needle when suturing, and its availability enhance safety when suturing and quality midwifery care. There are limited studies to support this study.

- **Needle holder in each delivery packs is functioning well.**

Table 4.13 shows 49%(n=28) of midwives agree needle holder in each delivery packs is functioning well and equally 49%(n=28) of midwives disagree needle holder in each delivery packs are functioning well. However, 2%(n=1) of midwives were uncertain that needle holder in each delivery packs is functioning well. There are limited studies to support that. Functional needle holders necessitate good midwifery practice and may reduce chances of needle pricks while suturing, therefore not having a functional needle holder puts midwives at risks of sustaining needle pricks and hinders safety when suturing tears and episiotomy cuts.

- ***Some midwives do not use needle holders but their own hand when suturing tears and episiotomy cuts.***

Table 4.13 shows 64%(n=37) of midwives disagree that some midwives do not use needle holders but their own hand when suturing tears and episiotomy cuts, however 35%(n=19) of midwives agree that some midwives do not use needle holders but their own hand when suturing tears and episiotomy cut and 2%(n=1) of midwives uncertain that some midwives do not use needle holders but their own hand when suturing tears and episiotomy cuts. When needle holders are not utilised and midwives tend to use their own hands to suture, they put them-selves and mothers at risks of cross infections from needle prick, avoidable injuries as the needle can easily slip's. There were no studies found to support the results.

- ***Umbilical cord scissor is available in each delivery pack.***

Table 4.13 shows 81%(n=46) respondent agree that umbilical cord scissor is available in each delivery pack and 19%(n=11) midwives disagree that umbilical cord scissor is available in each delivery pack. A study in northern Ghana showed that a wide variety of tools were used in umbilical cord cutting, the most used being razor blades or scissors (Udosen, Olaoye, Esienumoh, Udosen & Amaechi, 2019).

- **Some umbilical cord Scissors are blunt (cannot cut).**

Table 4.13 shows 84%(n=48) midwives agree disagree that some umbilical cord scissors are blunt (cannot cut), however 16%(n=9) midwives disagree that some umbilical cord scissors are blunt (cannot cut). Umbilical cord scissors are safe way to separate the umbilical the cord, with minimal effort. Having blunt umbilical cord scissor may results in midwives improvising by utilising razors which can be unsafe and may results in injuries to neonate and midwives.

- **I utilise a razor blade for cutting umbilical cord in absence of functional umbilical cord scissor.**

Table 4.13 shows 87% (n=44) of midwives agree that they utilise a razor blade for cutting umbilical cord in absence of functional umbilical cord scissor and 13% (n=7) of midwives disagree that I utilise a razor blade for cutting umbilical cord in absence of functional umbilical cord scissor. Number of studies reported a use of razor blade to cut umbilical cord. A study in Uganda reported the use of brand-

new razor blades or surgical blades, usually as part of delivery kits, during the cutting of their baby's umbilical cord, midwives further reported that they have been using razor blades but if they are to use a razor blade, they usually have new razor blades, and now they mostly use scissors (Mukunya, Haaland, Tumwine, Tylleskar, Nankabirwa & Moland, 2020).

The study showed diversity in methods of cutting and caring the cord after birth among the rural population district of Attock, that surgical blade usage for cord cutting was 50%, 48.7% used scissors while 1.3% used knife to cut the umbilical cord after birth (Khan, Aleem, Mushtaq & Mian, 2020). Additionally, a study in Ghana showed that it is important to know that approaches to cord care differ and have been evaluated in terms of their impact on timing of cord separation, bacterial colonization, and infections (Udosen, Olaoye, Esienumoh, Udosen & Amaechi, 2019). However, a study in Dhaka, Bangladesh indicated that the presence of injury at birth, and cutting of umbilical cord by blade during delivery were associated with higher number of danger signs (Siddika, Hossain, Moni, Nabi, Akhtar, Siddika, Mazid & Tabassum, 2021).

- ***Episiotomy scissors are available in each delivery pack.***

Table 4.13 shows 77%(n=44) of midwives agree that episiotomy scissors are available in each delivery pack, however 23%(n=13) of midwives disagree that episiotomy scissors are available in each delivery pack. The episiotomy is a technique originally designed to reduce the incidence of severe perineal tears (third and fourth degree) during labour. The general idea is to make a controlled incision in the perineum, for enlargement of the vaginal orifice, to facilitate difficult deliveries, the major goal of an episiotomy is to prevent serious tears to the perineum, and therefore, it is vital to list the varying degrees of vaginal tears ranging from first to fourth degree (Barjon & Mahdy, 2022). Available episiotomy scissors enhance quality care practices during delivery.

- ***Some episiotomy scissors are blunt.***

Table 4.13 shows 89%(n=51) of midwives agree that some episiotomy scissors are blunt but only 11%(n=6) of midwives disagree that some episiotomy scissors are blunt. According to a study conducted by hospitals in Limpopo province

showed that episiotomy scissors were limited and blunt thus participants improvised by using the scalp blade to conduct episiotomy, further showing that the use of a blade was a suboptimal midwifery intervention that might course medico-legal hazards (Thopola & Lekhuleni, 2019).

- ***A Razor blade is utilised to perform episiotomy in the absence of functional episiotomy scissor.***

Table 4.13 shows 76%(n=43) midwives agree that they utilize the razor blades to perform episiotomy in the absence of functional episiotomy scissor, however only 24%(n=13) midwives disagree that razor blade is utilised to perform episiotomy in the absence of functional episiotomy scissor. The use of blade to conduct episiotomy impede optimal care during delivery, it may cause harm to baby, mother and midwives hence a suboptimal care practice. However, an episiotomy is performed using either scissors or a scalpel (Barjon & Mahdy, 2022).

4.3.4 Section D: Infection Control and Prevention.

Table 4.14: Infection Control and Prevention

Infection control	SA	A	D	SD	U
1. Delivery packs available are autoclaved before use.	40 (70%)	17 (30%)	0 (0%)	0 (0%)	0 (0%)
2. Autoclaved delivery packs are enough to meet patient demand during delivery.	26 (46%)	20 (35%)	8 (14%)	3 (5%)	0 (0%)
3. Sterility of the delivery packs is maintained during delivery.	27 (47%)	23 (41%)	4 (7%)	3 (5%)	0 (0%)
4. Sterile delivery trolleys are adequate to meet patient demand.	16 (28%)	24 (42%)	11 (19%)	5 (9%)	1 (2%)
5. The delivery bed is cleaned after delivery.	26 (45%)	30 (53%)	0 (0%)	1 (2%)	0 (0%)
6. Personal protection equipment such as shielded mask/google, gowns and gloves are available.	18 (31%)	19 (33%)	10 (18%)	10 (18%)	0 (0%)
7. Personal protection equipment is being utilized.	21 (37%)	28 (49%)	7 (12%)	1 (2%)	0 (0%)

8. Bp apparatus-cuff is cleaned weekly.	11 (19%)	9 (16%)	26 (46%)	8 (14%)	3 (5%)
9. Bp apparatus-cuff is thoroughly cleaned after being used by infectious patient.	14 (24%)	19 (33%)	18 (32%)	6 (11%)	0 (0%)
10. Delivery trolley is cleaned in between patients.	20 (35%)	24 (42%)	10 (18%)	3 (5%)	0 (0%)
11. Overhead radiant heater is cleaned daily.	18 (32%)	12 (21%)	21 (37%)	3 (5%)	3 (5%)
12. Suctioning bottles are changed according to the hospital's infection control policy.	18 (32%)	26 (46%)	10 (17%)	2 (3%)	1 (2%)
13. Bed spacing is adequate to maintain infection control and prevention.	18 (32%)	21 (37%)	11 (19%)	7 (12%)	0 (0%)

- ***Delivery packs available are autoclaved before use.***

Table 4.14 shows 100%(n=57) of midwives agree that delivery packs available are autoclaved before use. Sterilization kills all microorganisms and spores. Autoclaving (saturated steam under high pressure) is the most common method for sterilizing surgical instruments, however, dry heat and chemical sterilant (ethylene gas, hydrogen peroxide gas plasma, etc.) can also be used (Kavitha, 2018). A study conducted in Harare city stated that delivery instruments were cleaned and autoclaved after every procedure, furthermore that the provision of sterile instruments can decrease infection rates and standard infection prevention and control measures like use of sterile equipment of peripartum infection prevention (Tirivavi, Chikanya & Mundagowa, 2019). In some facilities in Ghana delivery packs were prepared in advance and wrapped in a sterile cloth, making workload more manageable for midwives just before a delivery (de Barra, Gon & Penn-Kekana, 2021).

- ***Autoclaved delivery packs are enough to meet patient demand during delivery.***

Table 4.14 shows 81%(n=46) midwives agree that autoclaved delivery packs are enough to meet patient demand during delivery, however only 11%(n=19) midwives disagree that autoclaved delivery packs are enough to meet patient demand during delivery. A study in Swaziland indicated that provision of enough delivery packs will improve and significantly contribute to reduction of puerperal sepsis attributed to contamination during the process of childbirth (Vilakati, Masuku & Tagutanazvo, 2018).

- ***Sterility of the delivery packs is maintained during delivery.***

Table 4.14 shows 88%(n=50) midwives agree that sterility of the delivery packs is maintained during delivery, but 12%(n=7) respondent disagree that sterility of the delivery packs is maintained during delivery. Sterilized instruments must be stored properly to ensure its sterility till its usage also sterile packages should always be handled with care (Kavitha, 2018).

- ***Sterile delivery trolleys are adequate to meet patient demand.***

Table 4.14 shows 70%(n=40) of midwives agree that sterile delivery trolleys are adequate to meet patient demand. However, 28%(n=16) of midwives disagree that sterile delivery trolleys are adequate to meet patient demand. This enhances quality care for pregnant women and minimizes risks of infections.

- ***The delivery bed is cleaned after delivery.***

Table 4.14 shows 98%(n=56) of midwives agree that the delivery bed is cleaned after delivery and 2%(n=1) midwives disagree that the delivery bed is cleaned after delivery. Cleaned beds minimises risks of infections to pregnant women and promotes health. Literature related to the above findings was not found.

- ***Personal protective equipment such as shielded mask/goggle, gowns, and gloves are available.***

Table 4.14 shows 64%(n=37) of midwives agree that personal protective equipment (PPE) such as shielded mask/goggle, gowns, and gloves are available and 36%(n=20) of midwives disagree that PPE such as shielded mask/goggle, gowns and gloves are available. However, a study conducted about midwives in the Limpopo province reported that they are expected to provide quality care to pregnant women, but they do not even have enough gloves to do per vaginal examinations (Mothiba, Skaal, & Berggren, 2019). An acute shortage of PPE was faced by the staff in Nepal public hospitals in the initial pandemic phase. Some staff reported self-purchasing their PPE which placed an additional financial burden on the and their families (Basnet, Chapagain & Sebedi, 2022).

- ***Personal protective equipment is being utilized.***

Table4.10 shows 86%(n=49) midwives agree that PPE is being utilized, but14%(n=8) midwives disagree that PPE is being utilized. Use of PPE is vital in infection control and prevention to reduce risk of infection amongst pregnant women, their babies, and midwives. There were no related studies found to support the above results.

- ***BP apparatus-cuff is cleaned weekly.***

Table 4.14 shows 60%(n=34) midwives disagree; however, 35%(n=20) midwives agree that BP apparatus-cuff is cleaned weekly and 5%(n=3) uncertain that BP apparatus-cuff is cleaned weekly. Cleaned BP cuff reduces risks of infections from patient to patient. There were no related studies found to support the above results.

- ***BP apparatus-cuff is thoroughly cleaned after being used by infectious patient.***

Table 4.14 shows 57%(n=33) midwives agree that BP apparatus-cuff is thoroughly cleaned after being used by infectious patient, however 43%(n=2) midwives disagree that BP apparatus-cuff is thoroughly cleaned after being used by infectious patient. There were no related studies found to support the above results.

- ***Delivery trolley is cleaned in between patients.***

Table 4.14 shows 77%(n=44) midwives agree that delivery trolley is cleaned in between patients but, 23%(n=13) midwives disagree that delivery trolley is cleaned in between patients. This reduces risk of infections and enhances optimal care practices during labour. Researcher found no relatable studies to support the above results.

- ***Overhead radiant heater is cleaned daily.***

Table 4.14 shows 53%(n=30) midwives agree disagree that overhead radiant heater is cleaned daily and only 43%(n=24) midwives disagree that overhead radiant heater is cleaned daily. This helps promote health to neonates and reduces risks of infections to neonates. There were no related studies found to support the above results.

- ***Suctioning bottles are changed according to the hospital's infection control policy.***

Table 4.14 shows 78%(n=44) midwives agree that suctioning bottles are changed according to the hospital's infection control policy. But 22%(n=13) disagree that suctioning bottles are changed according to the hospital's infection control policy. Cleaned suctioning bottles is important to prevent spread of pathogens from patient to patient, keeping the bottle clean and healthy also ready for use. There were no related studies found to support the above results.

- ***Bed spacing is adequate to maintain infection control and prevention.***

Table 4.14 shows 69%(n=39) midwives agree that bed spacing is adequate to maintain infection control and prevention. However, 31%(n=18) midwives disagree that bed spacing is adequate to maintain infection control and prevention. Safe distance can prevent spread of infections from patient to patient and to midwives as well. Researcher found no related studies to support the above results.

4.4 CONCLUSION

This chapter presented results of the study from midwives. There results were presented in form of pie charts, graph, and tables. Lastly the statistical findings on equipment as a potential barrier to optimal intrapartum and delivery of pregnant women were indicated and shown in line with the structured questionnaires. Chapter 5 will discuss of the results and application of theory.

CHAPTER 5

DISCUSSION OF THE RESULTS AND APPLICATION OF THEORY

5.1 INTRODUCTION

This chapter will discuss the interpretation of the study results and recommended strategies based on four concepts in nursing need theory by Virginia Henderson. The results based on midwives' perspective regarding the use of equipment for optimal intrapartum monitoring and delivery of pregnant women.

5.2 DISCUSSION OF RESULTS

The result will be discussed as follows, demographic data, midwives' roles on use of equipment, equipment used during intrapartum and delivery, and lastly infection control and prevention:

- ***Demographic data***

Midwives' age ranged between 20-59 years and midwives between age 20-29 years were more dominant, the study was dominated mostly by female midwives, this shows that nursing is still a profession mostly practiced by females as compared to males. Majority of midwives were less trained for advanced midwifery, how-ever this did not affect their knowledge on equipment uses as they were all using same equipment. The study showed that midwives allocate for day duty was more as compared to night duty, showed that more staff was found during day duty and lesser staff at night duty and this however, did not have effects on the study as they all functioned in one environment, using same available equipment within the labor unit to ensure optimum care is provided to pregnant women during labour.

- ***The midwives***

The study showed that midwives knew their roles regarding the use of equipment when attending pregnant women. A midwife is a person who has met the prescribed education requirements for registration as a midwife and who can assume responsibility and accountability for such practices (Sedeeka, 2018). However, midwives in the study described some barriers in the administration of

care related to the equipment used. Barriers to administering care negatively affect the midwives as they must account at the end of the day for the care, practice, and actions taken from the environment in which care is given, it further affects the care given to pregnant women as they are recipients of care. Midwives indicated that the equipment used needed improvement, this is evidence that midwives do encounter barriers and with quality, functional and available equipment they will be able to give grand admirable care to pregnant women. Reported non-functional equipment was not attended to promptly, this causes more constraints and impedes respondent's quality care to pregnant women. Quality care is the extent to which the health care service provides care to the individual and the patient population to improve desired health outcomes, to render quality care, the health care must be safe, effective, timely, equitable, and people centred (WHO, 2016).

- ***Equipment used during intrapartum and delivery***
- ***Blood pressure machine***

The study indicated that BP machines were available in the labor room, functional, but were not adequate. In case of having more patient influx, using only one BP machine as evidenced in the study. According to the guideline for maternity care in South Africa, (2018) blood pressure monitoring on pregnant women in labor must be done on admission, every four hourly in the latent phase of labor, hourly in the active phase of labor, after delivery of the placenta and after one hour of the fourth stage of labour in relation to the research findings lack of adequate BP machines can hinder the monitoring of pregnant women's BP in the correct time and be a barrier to early diagnosis of blood pressure related conditions. The study also showed that BP machines could not be reliable as they were not routinely serviced, this hinders optimal monitoring of pregnant women and can lead to mismanagement of the pregnant women, missed opportunities for early and accurate diagnoses, and could endanger the pregnant women and their baby.

- ***CTG Monitor***

In the study, CTG monitoring was not a barrier to monitoring pregnant women in labor. Midwives indicated that the CTG monitor was available and functioning with CTG paper roll always available. Lastly, midwives know the benefits of CTG monitor and can interpret the CTG results.

- ***FHR monitoring***

FHR monitor (device) was available, and also functioning well however midwives identified that FHR monitor needed improvement. An available and functional FHR device is essential in labour unit to monitor fetal heart rate. Midwives indicated that the FHR monitor(device) needed improvement, using a handheld doppler is more comfortable and gives accurate results, making it easier to detect FHR abnormalities (as it gives readings and sound of the FHR) however can be rarely available as compared to pinard fetoscope which is likely to be giving human error as one has to listen (by pressing the fetoscope with an ear on pregnant women's abdomen) for monitoring FHR, then count using a watch and calculate. Pinard fetoscope can sometimes cause discomfort to the ear and on the women's abdomen, in the case where one has great abdominal adipose, it may be difficult to auscultate the FHR as compared to the handheld doppler.

- ***During delivery***

The study showed that beds were not adequate to meet patients' demands, which affects the quality management of pregnant women and pregnant women's comfort in labor unit. This is supported by a study conducted in Pretoria, South Africa on poor quality midwifery care showed that midwives are doing their best in providing midwifery care but are aware that sometimes it is of a substandard state, reason related to influx of patients. (Matlala & Lumadi, 2019).

Examination lights were available however not all were functioning well. Examination lights are essential during observations as they give suitable visibility and provide faithful images, not having examination lights that are functioning well can hinder the management of the patient. Overhead radiant warmer was not available in each delivery room, not all were functioning well in each delivery room, also that they were not adequate to meet new-borns demands this affected

quality of care to new-borns and new-borns are then likely to develop hypothermia. High-quality intrapartum care is critical to the survival of the mother and the newborn (Brenner, Madhavan, Nseyia, Sese, Fink & Shapira, 2022). More midwives identified that examination scales were not available however that examination scales were functioning well, unavailability of examination scales hinders midwifery care and is likely an impediment to birthweight measurement.

- ***The delivery pack***

Midwives indicated that delivery packs were available and complete inside which enhanced good delivery of a pregnant woman. Pre-packed delivery packs are essential for optimal care to pregnant women and allow midwives to provide quality care practices when delivering to a pregnant woman. The availability and functional arterial forceps are essential for good midwifery care for pregnant women.

Needle holders were available however midwives indicated that not all were functioning well – the challenge of not having functional needle holders will be that safety care during suturing will be compromised, which may result to risk of having needle pricks. Midwives defined safely measures when delivering safe maternity care as having appropriate equipment (Sedeeka, 2018).

Umbilical cord scissor is available in the delivery packs, however, midwives reported that they were blunt, and that razor blade is utilized in the absent of functional umbilical cord scissor, blunt umbilical cord scissors hinder good quality, and using razor blade can result in injuries. Midwives indicated that episiotomy scissors are available, however, some were blunt, and a razor blade is utilized in the absence of a functional episiotomy scissor, blunt episiotomy scissors affect the work of midwives, put midwives in a bad position to improvise for work to be done, the use of razor blade to perform episiotomy can result in harm to both midwives and pregnant women and suboptimal care. Occupational Health and Safety Act 85 of 1993 provides the requirements that employers must comply with the order to create a safe working environment for employees in the workplace.

- ***Infection control and prevention***

Improving access and quality of obstetric service has the potential to avert preventable maternal, neonatal, and stillborn deaths -yet little is known about the quality of care received (Kanyangarara, Chou, Creanga & Walker, 2018). Delivery of quality health care is a constitutional obligation in South Africa (Maphumulo & Bhengu, 2019). In the current study, there was no impediment to infection control and prevention practices emerging from the use of equipment in labor unit. Midwives indicated that delivery packs were available and adequate, also sterile packs was supplied effectively during delivery. Sterile delivery trollies were adequate in labour unit. The delivery bed was cleaned after deliveries of pregnant women. PPE was available and utilized. BP cuffs were not cleaned weekly, however, were cleaned though roughly after being used by the infectious patient. The overhead radiant warmer was cleaned daily while suctioning bottles were changed according to the hospital infection control policy. Lastly, bed spacing was adequate to maintain infection control and prevention. The DoH, in consultation with various other bodies, developed a Patient Rights Charter that states that every individual has the right to a healthy and safe environment, to contribute to their physical and mental health or well-being (DoH, 2008).

5.3 Integration of nursing need theory of Virginia Henderson with the study results and the recommended strategies.

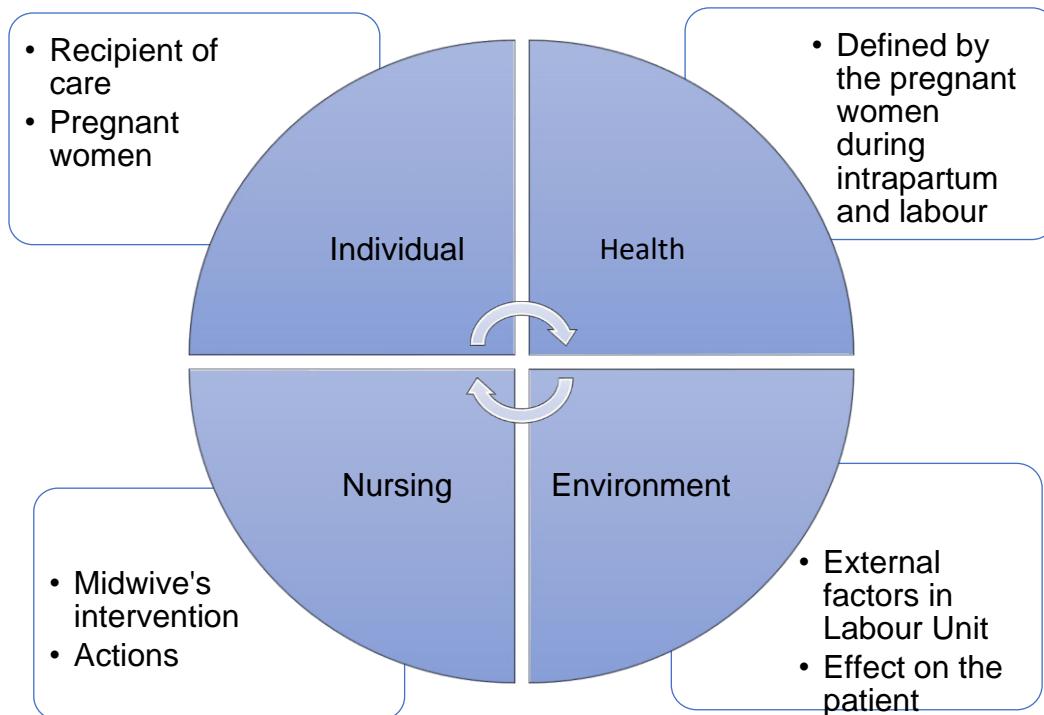


FIGURE 5.1: Henderson’s major concepts in nursing need theory

Figure 5.1 shows Henderson’s major concepts in nursing need theory that were adopted in this research study. Also, the recommended strategies are based to achieve optimal intrapartum and delivery on pregnant women in labour unit using effective equipment is integrated to the major concepts of the theory. Recommended strategies are based on identified equipment which that impeded optimal intrapartum and delivery care of pregnant women. The arrows show that the concepts mentioned are dependent also that they work hand in hand; an individual is dependent on health, environment, and nursing for optimal care to be achieved.

5.3.1 Individual

Pregnant women in labor have basic needs to achieve health. Equipment required to maintain health has to always be available, and in good working conditions for midwives to achieve the health needs. Pre-preparations of equipment and implementation of good working equipment should be a basic requirement in the labor unit. Equipment required in the labor unit needs to be made available and

maintained to promote optimum service delivery. Functional equipment must be always ensured that the basic needs of pregnant women to achieve and maintain health are met during all stages of labor.

5.3.2 Health

Quality care needs to be provided to pregnant women with the use of proper quality equipment to maintain their healthy state of wellbeing of pregnant women. Good quality working equipment needs to be established and prioritised to maintain the health status of pregnant women and their unborn children. Equipment needs to be improved to enhance optimal care to pregnant women. Access to available and adequate equipment needs to be a priority for the health of pregnant women and their babies.

5.3.3 Environment

Environment were all the hindrances to optimal care to pregnant women in the context in which care is provided that are related to equipment to be utilised within that environment. A complete-daily checklist needs to be implemented to assess availability of equipment, its working conditions, completeness within the labour room and equipment adequacy. Unavailable and non-functional equipment need to be identified and be made accessible and available. Non-functional equipment needs to be reported, be fixed, or replaced to enhance optimal of care. Non available equipment needs to be made available to minimise contributing barriers to optimal care. Environments needs to be of good comfort, promote life and good health to pregnant women. Infection control and prevention practices must always be of good standard and maintained of good standard with the use of equipment.

5.3.4 Nursing

The well-trained management team must be established to ensure quality optimal care is provided about equipment used in labor unit. Midwives need to be provided with good, quality working equipment to practice optimal care for pregnant women. Midwives must report non-working equipment, lacking equipment, and unavailable equipment, and make follow-ups on actions done. Midwives need to address equipment that needs improvement. Midwives must

be trained on equipment used in the labor unit and their roles in that regard. Midwives need to avoid practices of improvising, by putting their health at risk, careers, and risk to pregnant women, there-by making an impact that DoH provides them with quality equipment for good midwifery practice. Lastly, Midwives must be provided with a good working environment, not lack equipment, challenge free working environment with the use of equipment.

5.4 CONCLUSION

This chapter discussed the findings of the study which showed that midwives knew their roles in the care of pregnant women in labor. However, midwives described barriers with related use of available equipment. Not all equipment was a hindrance however some equipment was identified as not being available, not functional, available but not functional, and some equipment needed improvement. Infection control and prevention practices were of good practices. Lastly, the study presented the integration of the nursing need theory with the study results and recommended strategies to enhance optimal monitoring of pregnant women related to equipment that is used during intrapartum and delivery.

CHAPTER 6

SUMMARY, LIMITATIONS, RECOMMENDATIONS, AND CONCLUSION OF THE STUDY

6.1 INTRODUCTION

This chapter focus on the summary of the research study, recommendations, limitations of the study, and lastly conclusions of the study. The summary of the study will be based on the objectives of the study and how they were then achieved based on the results.

6.2 RESEARCH DESIGN AND METHOD

The researcher used a quantitative research method with a cross-sectional design to describe the outcomes of equipment that hinders optimal monitoring of pregnant women during intrapartum and delivery in selected hospitals of Sekhukhune district, Limpopo Province. The study population were 59 midwives allocated in labor unit of four selected hospitals of Sekhukhune district. Questionnaires consisted of 57 self-developed questions was administered to 59 midwives. But two questionnaires were spoiled due to not being complete hence 57 questionnaires were analyzed.

6.3 SUMMARY OF RESEARCH RESULTS

6.3.1. The study aim

The study aimed to investigate the potential impediment to optimal monitoring of pregnant women related to equipment used during intrapartum care and delivery.

6.3.2 Restatement of the study objectives

1. To identify the potential impediment to optimal monitoring of pregnant women related to equipment used during intrapartum and delivery.
2. To describe how the equipment used during intrapartum care and delivery could be a potential impediment to the optimal monitoring of pregnant women.
3. To come up with recommendation to enhance optimal monitoring of pregnant women related to equipment that is used during intrapartum and delivery.

6.3.3. Outcomes of the research study

To identify the potential impediment to optimal monitoring of pregnant women related to equipment used during intrapartum and delivery.

- Midwives identified that there was a barrier to render quality intrapartum care and delivery care due to nonfunctional equipment, and equipment that were there but needed improvement.
- Inadequate BP machines, and routine services not done on BP machines can endanger lives and health of both the mother and fetus therefore also hinder diagnosis and early prevention of complications.
- Midwives identified that the equipment used to monitor FHR needed improvement. Not having the proper equipment to monitor FHR hinders diagnosis hence early prevention of fetal complications.
- In the delivery room, bed capacity was not enough to meet patients' demands, which hinders quality patient care. Examination lights were not functioning well in some delivery rooms, overhead radiant warmer were inadequate to meet new-borns demands, overhead radiant warmer were not available in each delivery, some radiant warmer was not fully functional, and the new-born scale was not available in some facilities; this hinders the quality of care provided to pregnant women hence may result in suboptimal care practices.
- The delivery packs were available and delivery packs were complete, however, certain equipment was not-functioning well. Umbilical cord scissor was blunt as well as episiotomy scissors, which made midwives improvise thereby utilizing razor blade to separate the umbilical cord and performing episiotomy, this can result in a medico-legal hazard, hence a suboptimal practice. Needle holders also not-functioning well resulting in midwives using their own hands to suture the perineum which is a suboptimal practice and can in-danger midwives and mothers.
- Infection control and prevention practices were of good practice.

To describe how the equipment used during intrapartum care and delivery could be a potential impediment to the optimal monitoring of pregnant women.

- Midwives described that equipment used in labor unit needed improvement and reported non functional equipment was not attended to promptly, also experienced barriers to render quality midwifery services during intrapartum and delivery of pregnant women.
- With equipment that was used during intrapartum, midwives described that equipment was inadequate such as using one BP machine, and BP machine not regularly serviced. Midwives further described that devices used to monitor FHR needed improvement.
- Midwives described that equipment used during delivery were inadequate, such as bed capacity in labor room, nonfunctional radiant warmer and birth scale and nonfunctional examination light.
- Equipment in the delivery packs were described to be having nonfunctional equipment such as needle holders, blunt umbilical cord scissor, and blunt episiotomy scissor, midwives described that they utilise razor blades in absence of functional umbilical cord scissor and episiotomy scissors, this hinders the quality of procedures carried during delivery, may results un unsafe practice, risk of needle pricks and harm form the razor blade and may contribute to preventable birth injuries.
- Infection control and prevent were of good practices.

Integration of nursing need theory of Virginia Henderson with the study results and the recommendations.

- Regarding the individual, equipment required to maintain health has to always be available, and in good working conditions. Prior preparations of equipment and implementation of good working equipment should be a basic requirement in the labor unit. Equipment required in the labor unit needs to be made available and adequate to prevent lacking. Functional equipment must be always ensured that the basic needs of pregnant women to achieve and maintain health are met during labor.
- Health was defined by the pregnant women in labor. Quality care needs to be provided to pregnant women with the use of proper quality equipment to maintain their healthy state of wellbeing of pregnant women. Good quality working equipment needs to be established. The health of pregnant women and their unborn children needs to be prioritized. Quality care needs to be practiced, to enhance good health. Equipment needs to be improved to

enhance optimal care for pregnant women. Access to available and adequate equipment needs to be implemented.

- Environment was all the hindrances to optimal care to pregnant women in the context in which care is provided that is related to equipment to be utilized within that environment. A complete-daily checklist needs to be implemented to assess the availability of equipment, functionality of the equipment, completeness within the labor room, and equipment adequacy. Unavailable and non-functional equipment needs to be identified and made accessible and available. Non-functional equipment needs to be fixed or replaced to enhance optimal care. Non-available equipment needs to be made available to exclude contributing barriers to optimal care. Environments need to be of good comfort, and promote life and good health to pregnant women. Infection control and prevention practices must be maintained of good\high standard.
- Nursing was all midwifery actions and interventions. The well-trained management team must be established to ensure quality optimal care is provided about equipment used in the labor unit. Midwives need to be provided with good, quality working equipment to practice optimal care for pregnant women. Midwives to report non-working equipment, lacking equipment, and unavailable equipment, make 4follow-ups on actions done. Midwives need to identify the equipment that needs improvement. Midwives must be trained on equipment used in the labor unit and their roles in that regard. Midwives need to avoid practices of improvising, by putting their health at risk, career, and risk to pregnant women, there-by making an impact that doh provides them with quality equipment. Lastly, midwives must be work in a conducive environment, not lack equipment, and that is challenge free.

6.4 RECOMMENDATIONS

- The employer/ DoH should meet all the required equipment in labour unit, needed for midwives to practice good quality care.
- The employer/DoH should prioritize improving equipment utilized in the labor unit with annual budgets.
- With the patient influx, infrastructure improvement is needed and more beds to meet patient demand.

- Midwives and unit managers maintain and sustain a good standard of health care services with the use of equipment in the labor unit.
- Regular maintenance of equipment used in the labor unit.
- Midwives and management need to be given in-service on equipment used in the labor unit.
- A daily checklist on assessing the functionality of the equipment.
- Lacking equipment needs to be noted, reported, and follow-ups made on when it will be made available.
- DoH employs proficient technicians who are always available to assist in fixing non-functional equipment and service equipment.

6.5 CONTRIBUTION OF THE STUDY

Quality care practices have positive birth outcomes for pregnant women in labor. Midwives described barriers to optimal care for pregnant women in labor regarding equipment used during intrapartum and delivery. The barriers were in a form of unavailable equipment, non-functional equipment, reported nonfunctional equipment not attended to promptly, and equipment not being in good condition. The study will enhance the optimal care for pregnant women, and their fetus during intrapartum and delivery. The study will also help the employer identify the gap/barriers in the labor units, therefore improving where there are impediments. The recommendation may help policy makers to improve labor unit equipment to enhance optimal care.

6.6 LIMITATIONS OF THE STUDY

Midwives in the maternity ward located at ANC and postnatal care who did not provide daily continuous care to pregnant women during intrapartum and delivery were excluded from the study. Nurses without midwifery qualifications, medical doctors working in the labor unit, unit managers, and student midwives were limited to the study.

6.7 CONCLUSION

This chapter discussed the summary of the study, its limitations, and recommendations of the study. The optimal care of pregnant women during

intrapartum was hindered by a lack of functional equipment, equipment not being in good working condition, and not available equipment. Equipment in the labor unit needs to be complete, and in good working conditions to enhance good quality and optimal care for pregnant women in labor.

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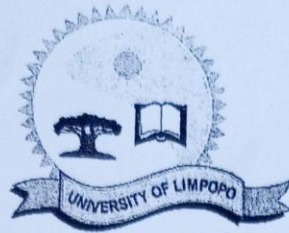
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APPENDIX A: TURFLOOP RESEARCH AND ETHICS COMMITTEE ETHICS CLEARANCE CERTIFICATE



University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE ETHICS CLEARANCE CERTIFICATE

MEETING: 11 May 2021

PROJECT NUMBER: TREC/82/2021: PG

PROJECT:

Title: Equipment as a potential impediment to optimal intrapartum monitoring and delivery of pregnant women in public hospitals of Sekhukhune District, Limpopo Province, South Africa

Researcher: KM Mohlala

Supervisor: Prof MK Thopola

Co-Supervisor/s: Ms MG Mathebula

School: Health Care Science

Degree: Master of Nursing

PROF P MASOKO

CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE


The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

Note:

- i) This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.
- ii) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.
- iii) PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

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APPENDIX B: APPROVAL LETTER FROM LIMPOPO DEPARTMENT OF HEALTH

**LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref : LP_2021-06-002
Enquires : Ms PF Mahlokwane
Tel : 015-293 6028
Email : Phoebe.Mahlokwane@dhsd.limpopo.gov.za

Kgaladi Mpule Mohlala

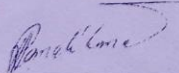
PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

Equipment as a potential impediment to optimal intrapartum monitoring and delivery of pregnant women in public hospitals of Sekhukhune District, Limpopo Province, South Africa

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
 - a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
 - b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
 - c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
 - d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - e. The approval is only valid for a 1-year period.
 - f. If the proposal has been amended, a new approval should be sought from the Department of Health
 - g. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated



pp Head of Department

15/07/2021

Date


NB: Currently access is restricted to our facilities due to COVID-19 therefore this approval is applicable within our Covi-19 policies and circulars

Private Bag X9302 Polokwane
Fidel Castro Ruz House, 18 College Street, Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.
Website: <http://www.limpopo.gov.za>

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APPENDIX C: APPROVAL LETTER FROM SEKHUKHUNE DISTRICT

DEPARTMENT OF HEALTH
SEKHUKHUNE DISTRICT

 **LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DATE: 03/09/2021
RECEIVED BY: Phasha M.S.

DEPARTMENT OF
HEALTH
SEKHUKHUNE DISTRICT

Ref : S2/2/3
Enq : MOGANO K.N.M
Tel : 015 633 2412/ 076 399 8428
Date : 04 August 2021
Email: Norman.Mogano@dhsd.limpopo.gov.za

Kgaladi Mpule Mohlala

THE EQUIPMENT AS A POTENTIAL IMPEDIMENT TO OPTIMAL INTRAPARTUM MONITORING AND DELIVERY OF PREGNANT WOMEN IN PUBLIC HOSPITALS OF SEKHUKHUNE DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA.

Background

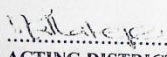
The above student is furthering studies with University of Limpopo for the degree in masters of nursing, student number: 201315407
Her research topic is THE EQUIPMENT AS A POTENTIAL IMPEDIMENT TO OPTIMAL INTRAPARTUM MONITORING AND DELIVERY OF PREGNANT WOMEN IN PUBLIC HOSPITALS OF SEKHUKHUNE DISTRICT HOS, LIMPOPO PROVINCE. It's a quantitative research which does not need access of any clinical records by the student. (It is a Questionnaire interview method with subjects of study)

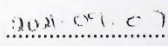
The Provincial department of health HOD has granted her permission to conduct this research and to observe and adhere to all principles of research

Motivation

The district HRD request that permission be further granted to Kgaladi Mpule Mohlala to conduct this research at Sekhukhune District Hospitals, as already been granted this permission by the provincial office as outlined on the attached letter.


Approved /not approved


ACTING DISTRICT EXECUTIVE MANAGER


Date

Private Bag X04, Chuenespoort 0745
Tel: (015) 633 2300, Fax: (015) 633 7927
Website: <http://www.limpopo.gov.za>

APPENDIX D: JANE FURSE HOSPITAL APPROVAL LETTER

**LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
HEALTH
JANE FURSE HOSPITAL

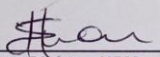
Ref : S5/2/3
Enq : Kgolane MT
Tel : 013265 9400/9427
Email : kgolanetshepo@gmail.com

To. Nursing Manager Section
Jane Furse Hospital
Private Bag x 429
Jane Furse
1085

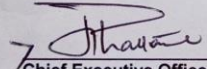
**THE EQUIPMENT AS A POTENTIAL IMPEDIMENT TO OPTIMAL INTRAPARTUM
ON MONITORING AND DELIVERY OF CHILD IN PREGNANT WOMAN IN PUBLIC HOSPITALS OF
SEKHUKHUNE DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA.**

The above matter bears reference

Please be informed that Ms. Kgaladi Mpule Mohlala has been granted permission to do research on the above mentioned matter by Limpopo Provincial Office and Sekhukhune District Office, with due respect please afford her the opportunity to do so.



Assistant Director HRM



Chief Executive Officer


2021.10.06
Date

2021-10-06
Date

Private Bag X429, Jane Furse
Corner R579 and R555 Mamone Road, Jane Furse 1085. Tel: 013 265 9400. Fax: 013 265 9647
Website: <http://www.limpopo.gov.za>

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APPENDIX E: DILOKONG HOSPITAL APPROVAL LETTER

 **LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
SEKHUKHUNE DISTRICT
DILOKONG HOSPITAL

Ref: S2/2/3
Enq: Mafogo G.A
Tel: 013 2104 7265

12/10/2021

Kgaladi Mpule Mohlala
University of Limpopo

**PERMISSION TO CONDUCT RESEARCH AT DILOKONG HOSPITAL
(MATERNITY WARD)**

1. We acknowledge the receipt of your application to conduct research on the 12/10/2021.
2. Kindly be informed that the Chief Executive Officer has granted you the permission to conduct research study in the equipment as a potential impediment to optimal intrapartum monitoring and service delivery of pregnant women in public hospitals of Sekhukhune district at Dilokong Hospital as per approval attached from provincial office.
3. You are requested to inform the HRD office about the commencement of your research at the institution.
4. Your positive contribution during your research will be highly appreciated.
5. Thanking you in advance.

.....*M. Mafogo*.....
CHIEF EXECUTIVE OFFICER

LIMPOPO PROVINCE	12/10/2021
CEO	DATE
2021-10-12	
DILOKONG HOSPITAL PRIVATE BAG X9119 DRIEKOP 1129	
DEPARTMENT OF HEALTH	

Dilokong District Hospital, Private Bag X9119, Driekop, 1129
Tel: (013) 214 7265 Fax: (013) 214 7201 Website: <http://www.limpopo.gov.za>

APPENDIX F: CONSENT FORM

Consent Form

Statement concerning participation in a Research Project:

Name of the research study: Equipment as a potential impediment to optimal intrapartum monitoring and delivery of pregnant women at public hospitals of Sekhukhune District, Limpopo Province.

I read and understand the topic of the study. The purpose and objectives of the study have been explained to me and I was given opportunity to ask questions and given adequate time to rethink the issue. I know and understand that I am, expected to give my views and experience I have regarding the above-mentioned topic.

I am aware that the results of this project will be used in scientific publications and will be electronically available throughout the world. I consent to this provided my name will not be revealed.

I understand that my participation in this study is completely voluntary, and I have not been pressurized at any way to take part in the study.

I _____ hereby give my consent to participate in the Study/ Project.

Midwife's Signature : _____

Date : _____

Place : _____

Witness : _____

Date : _____

Place : _____

APPENDIX G: QUESTIONNAIRE

Questions to the midwife

Please follow the instructions below before answering the following questions:

- Do not write your name on the questionnaire.
- Do not write the name of your institution on the questionnaire.
- Use blue/blank pen to fill in the questionnaire; and
- Where applicable, please answer the following questions by marking with an (X) in relevant block.

Section A: Demographic data

1. Age in years

_____ Years old

2. Gender

Male	1
Female	2

3. Qualification

Midwife	1
Advanced Midwife	2

4. Years working in Labour Unit

0-2 years	1
3-5 years	2
5 years and more	3

5. Work duty

Day duty	1
----------	---

Night duty	2
------------	---

Section B: The midwife Factors

For each of the following statements, please indicate the extent to which you agree or disagree, with a Mark of an (X) on relevant column using the key provided.

**SA-Strongly Agree A-Agree D- Disagree SD- Strongly Disagree
Uncertain**

SA=1 A=2 D=3 SD=4 U=5

Midwife	SA	A	D	SD	U
As a midwife, I know my role regarding the use of equipment when attending a pregnant woman during labour.	1	2	3	4	5
As a midwife, I experience barrier in administration of care to pregnant women, related to use of equipment.	1	2	3	4	5
Equipment used need improvement in my unit (labour ward).	1	2	3	4	5
Reported non-functional equipment are attended to promptly.	1	2	3	4	5
There is quality of care practices to pregnant women with the use of available equipment in the unit.	1	2	3	4	5

Section C: Equipment used during intrapartum and delivery

Blood Pressure (BP) monitoring	SA	A	D	SD	U
BP machine is available.	1	2	3	4	5
BP Machine is fully functional (give correct readings).	1	2	3	4	5
Bp machines available are adequate to monitor all women during intrapartum and labour.	1	2	3	4	5

Routine maintenance/service of BP machines are done.	1	2	3	4	5
Only one BP machine is used for all pregnant women in the unit.	1	2	3	4	5

Cardiotocography (CTG) monitoring	SA	A	D	SD	U
CTG Machine is available.	1	2	3	4	5
CTG machine is functioning well.	1	2	3	4	5
CTG paper rolls are always available.	1	2	3	4	5
I know the benefits of using CTG during intrapartum.	1	2	3	4	5
I can interpret the CTG results.	1	2	3	4	5

Foetal Heart Rate (FHR) monitoring	SA	A	D	SD	U
FHR monitor is available.	1	2	3	4	5
Equipment for monitoring FHR gives accurate readings.	1	2	3	4	5
There is a need to improve equipment used for monitoring FHR.	1	2	3	4	5

During delivery	SA	A	D	SD	U
The bed capacity is enough to meet the patient demand.	1	2	3	4	5
Examination lights are available in each delivery room.	1	2	3	4	5
Examination lights are functioning well in each delivery room.	1	2	3	4	5
Overhead radiant warmer is available in each delivery room.	1	2	3	4	5
Overhead radiant warmer are fully functional in each delivery room.	1	2	3	4	5
Overhead radiant warmer are adequate to meet the newborns demand.	1	2	3	4	5

Examination scales for new-born are available in each delivery room.	1	2	3	4	5
Examination scales for new-born are functioning well.	1	2	3	4	5

The delivery pack	SA	A	D	SD	U
Delivery packs are available.	1	2	3	4	5
Delivery packs are always complete inside.	1	2	3	4	5
Arterial forceps are available in each delivery pack.	1	2	3	4	5
Arterial forceps in each delivery packs are functioning well.	1	2	3	4	5
Needle holder is available in all delivery packs.	1	2	3	4	5
Needle holder in each delivery packs is functioning well.	1	2	3	4	5
Some midwives do not use needle holders but their own hand when suturing tears and episiotomy cuts.	1	2	3	4	5
Umbilical cord scissor is available in each delivery pack.	1	2	3	4	5
Some umbilical cord Scissors are blunt (cannot cut).	1	2	3	4	5
I utilise a razor blade for cutting umbilical cord in absence of functional umbilical cord scissor.	1	2	3	4	5
Episiotomy scissors are available in each delivery pack.	1	2	3	4	5
Some episiotomy scissors are blunt.	1	2	3	4	5
Razor blade is utilised to perform episiotomy in the absence of functional episiotomy scissor.	1	2	3	4	5

SECTION C: Infection Control and Prevention

Infection control	SA	A	D	SD	U
Delivery packs available are autoclaved before use.	1	2	3	4	5
Autoclaved delivery packs are enough to meet patient demand during delivery.	1	2	3	4	5

Sterility of the delivery packs is maintained during delivery.	1	2	3	4	5
Sterile delivery trolleys are adequate to meet patient demand.	1	2	3	4	5
The delivery bed is cleaned after delivery.	1	2	3	4	5
Personal protection equipment such as shielded mask/google, gowns and gloves are available.	1	2	3	4	5
Personal protection equipment is being utilized.	1	2	3	4	5
Bp apparatus-cuff is cleaned weekly.	1	2	3	4	5
Bp apparatus-cuff is thoroughly cleaned after being used by infectious patient.	1	2	3	4	5
Delivery trolley is cleaned in between patients.	1	2	3	4	5
Overhead radiant heater is cleaned daily.	1	2	3	4	5
Suctioning bottles are changed according to the hospital's infection control policy.	1	2	3	4	5
Bed spacing is adequate to maintain infection control and prevention.	1	2	3	4	5

APPENDIX H: EDITOR'S LETTER



With nurses every time

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27 March 2023

To Whom It May Concern

I hereby confirm that I have proof-read the document entitled: **"Equipment As A Potential Impediment to Optimal Intrapartum Monitoring and Delivery of Pregnant Women in Public Hospitals of Sekhukhune District, Limpopo Province, South Africa"** authored by **Mohlala KM**. I provided research and language editing with suggestions that the author may or may not accept, at her discretion.

Each of us has our own unique voice as far as both spoken and written language is concerned. In my role as proof-reader I try not to let my own "written voice" overshadow the voice of the author, while at the same time attempting to ensure a readable document.

Please refer any queries to me.

IT IS NICE DOING BUSINESS WITH YOU

A handwritten signature in black ink, appearing to be 'M. Mosenjani Mbonbi', written over a circular stamp or watermark.