



Evaluation of partogram utilization in maternity care in selected health care facilities of Bojanala District

SKM Mabasa



[orcid.org/ 0000-003-3707-9587](https://orcid.org/0000-003-3707-9587)

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Supervisor: Dr MJ Matsipane

Co-supervisor: Prof U Useh

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Student number: 21014000

DECLARATION

I, Suzan Kgomoitso Mercia Mabasa declare that the dissertation “Evaluation of Partogram Utilisation in Maternity Care in Selected Health Care Facilities of Bojanala District, North-West Province” is my original work and that all sources contained herein have been duly acknowledged.

SKM Mabasa

Date

DEDICATION

I dedicate this study to my late mother, Flora Modise who, during her life, encouraged me to continue studying. She will always be missed. May her soul rest in peace.

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ABSTRACT

Background

According to the 10th interim report on Saving Mothers (2011-2013), Bojanala Platinum District has been in the top 10 when ranked, for the number of deaths in South Africa. Causes of perinatal deaths in South Africa could be prevented with proper utilisation of partogram. Utilisation of a partogram remains a considerable challenge in the country, and this prompted the researcher to conduct a study on the utilisation of partogram in Bojanala District.

Objectives

To determine the frequency of recording of admission information, to determine the frequency of recordings during the latent phase of labour, to determine the frequency of recordings during the active phase of labour, to determine the frequency of recordings during the second stage of labour and to determine overall utilisation of partogram in selected health care facilities in Bojanala District.

Methodology

A quantitative descriptive cross-sectional study design was used to describe partogram utilisation in selected healthcare facilities using a checklist developed by the researcher. After a pilot study was conducted, a sample of 279 partograms of women who delivered was audited. Collected data were analysed using the Statistical Package for Social Sciences (SPSS) Version 22

Results

The study revealed that although partogram was utilised in all births, a meagre percentage was utilised according to the set standards. Results of this study revealed that the average partogram utilisation according to the WHO standards was equal to 20% and 80% was not utilised.

Conclusion

This study revealed high proportions of unrecorded parameters on partograms in selected health facilities coupled with inadequate monitoring of progress of labour that may have played a significant role in the adverse maternal and neonatal health outcomes. The researcher believes that recommendations of the study would assist in improving partogram utilisation in the maternity set up.

Keywords: *Partogram/partograph, utilisation, midwives, labour, maternal and neonatal outcomes*

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LIST OF ABBREVIATIONS

B.A: Birth Attendants

CPD: Continuous Professional Development

C/ S: Caesarean Section

Denosa: Democratic Nursing Organisation of South Africa

DoH: Department of Health

FHR: Foetal Heart Rate

IMMR: Institutional Maternal Mortality Ratio

MDG: Millennium Development Goals

MOU: Midwife Obstetric Unit

MMR: Maternal Mortality Ratio

NapeMMco: National Perinatal Morbidity and Mortality Committee

NCCEMD: National Committee on Confidential Enquiries into Maternal Death

NICU: Neonatal Intensive Care Unit

PPH: Post-Partum Haemorrhage

SAGI: South African Government Information

SDG: Sustainable Development Goals

SPSS: Statistical Package for Social Sciences

TSB: Total Serum Bilirubin

UN: United Nations

UNPFA: United Population Fund

VVF: Vesico Vaginal Fistula

WHO: World Health Organisation

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

This chapter provides the overview of the study inclusive of the background, statement of the problem, literature review, significance and objectives of the study. The purpose of this study was to evaluate partogram utilisation in selected healthcare facilities of Bojanala District in the North-West Province of South Africa.

1.2 BACKGROUND

A partogram is a printed chart on which observations in labour are recorded in a graphic format to provide an overview of labour, aiming to alert midwives and obstetricians about deviation in labour progress as well as maternal or foetal well-being (Orhue, Aziken & Osemwenkha, 2012:1). The Partogram indicates when augmentation of labour is appropriate and assists in recognising cephalo-pelvic disproportion long before the labour process becomes obstructed (Nolte, 2008:1). The partogram was initially designed for use in low-income countries. According to Mdoe (2012:1), the development of the partogram was initially done by Friedman in 1954, based on the observations of cervical dilatation and foetal station against time elapsed in hours from the onset of labour. Friedman in 1954 made a cervicography showing four phases of cervical dilatation which were latent, acceleration, and maximum slope and deceleration phases (Lavender, Hart & Smyth, 2013:3). Philpot later in 1972 conducted extensive studies in primigravidae in central and South Africa where he constructed a graph of cervical dilatation against time. He introduced the concept of alert line and action line. The observations consisted of foetal vital signs, maternal vital signs, features of labour and therapeutics undertaken in the course of the labour (Orhue *et al.*, 2012:1-8). The World Health Organisation's (WHO) partogram consists of the foetal condition, the maternal condition and the progress of labour. It also consists of space to chart the administration of drugs, intravenous fluids and oxytocin if labour is augmented (WHO, 1994:8). These early partograms formed the foundation for the model of the partogram, which was developed as an international standard in 1988 following the launch of the worldwide Safe Motherhood Initiative (WHO, 1994: 5).

Partogram/Partograph charts often contain pre-printed alert and action lines. An alert line represents the slowest 10% of primigravida women's labour progress. An action line is placed some hours after the alert line, usually two to four hours to prompt effective management of slow progress of labour (Lavender *et al.*, 2013:4). According to Mdoe (2012:1), the alert line represented the mean rate of progress of the slowest 10% of patients in the African population whom they served. The first WHO partogram or 'composite partogram', covers a latent phase of labour of up to eight hours and an active phase beginning when the cervical dilatation reaches 4 cm. An action line is placed some hours apart, separating it from the alert line. It is located on the right and is parallel to the alert line to act as a visual prompt as to when to commence effective treatment of the slow labour progress after some delays. The number of hours separating the alert and action line, which may be two or four hours, is the consensus as to how many hours the slow progress is allowed before initiating treatment (Orhue *et al.*, 2012:1). This partogram is based on the principle that during active labour, the rate of cervical dilation should not be slower than 1cm per hour. A lag time of 4 hours between slowing of labour and the need for intervention is unlikely to compromise the foetus or the mother and avoids unnecessary intervention (Tayade & Jadhao, 2012:256).

In the study conducted by Asibong, Okokon, Agan, Oku, Opiah, Essien and Monjok (2014:873), a partogram is seen as an obstetric tool with its usefulness and efficiency cutting across resource-poor and developed nations. Asibong *et al.* (2014:873) further revealed that evidence abounds that the acquisition of knowledge of its use and ensuring proper application of that knowledge would culminate in a remarkable reduction in the incidence and outcomes of prolonged and obstructed labour, which are reported to be associated with 8%–10% of maternal deaths. The National Department of Health of South Africa has advocated that the correct use of the partogram should become the norm in each institution conducting births (DoH, 2008:2). The National Department of Health (DoH) of South Africa also states that a quality assurance programme should be implemented, using an appropriate tool to assess this (DoH, 2008:2). However, the use of the partogram and maternity case records remains a considerable challenge for the country as a whole (Moalusi, 2011:5). According to Asibong *et al.*, (2014:874), one significant and unfortunate complication of both prolonged and obstructed labour is vesicovaginal fistula (VVF),

and the United Nations Population Fund estimates that about 2 million women are living with VVF, most of them in sub-Saharan Africa. Obstructed labour, also if left untreated can lead to sepsis, uterine rupture and post-partum haemorrhage. The partogram has been considered as one of the valuable tools in the improvement of maternity services. The purpose of a partogram is to detect the abnormal progress of labour as early as possible. It is also aimed at preventing prolonged labour, recognise cephalo-pelvic- disproportion long before obstructed labour and to assist in an early decision on transfer, augmentation or termination of labour. Finally, it is aimed at increasing the quality and regularity of all observations of mother and foetus and recognise maternal or foetal problems as early as possible (Orhue, Aziken & Osemwenkaa, 2012:1-8).

WHO (1994:7) set guidelines criteria for commencing a partogram during the latent phase of labour when the cervix is 0- 3 cm dilated, and uterine contractions are two in ten minutes lasting 20 seconds or more. The active phase of labour has to be plotted when the cervix is 4cm or more, and contractions are one in ten minutes, lasting for 20 seconds or more. One of the parameters used in the monitoring of the foetal condition during labour includes foetal heart rate. According to WHO (1994:7) protocol, partogram/partograph is recorded half hourly in the first stage of labour and every 15 minutes in the second stage of labour. It is judged to be standard if at least recorded hourly. Other parameters are membrane status, liquor quality and amount, and moulding. The progress of labour is a central part of a partogram and records the rate of cervical dilatation, the descent of the presenting part, pattern and strength of uterine contractions (WHO,1994:7).The third component records maternal temperature, pulse rate, maternal blood pressure, and regular urinalysis (Mdoe, 2012:2). According to the fourth report of the National Committee on Confidential Enquiries (NCCEMD) into maternal deaths in South Africa, the most frequent health care provider and avoidable factors in maternal mortality were a failure to follow standard protocols, poor problem recognition and initial assessment (DoH, 2008:1). The inadequate use of the partogram is a major avoidable factor in maternal and perinatal deaths in South Africa.

The maternal mortality rate was estimated at 625 deaths per 100,000 and for South Africa, meeting the target of 38:100 000 will be a tall order (Farrell, 2011:2). WHO

has laid out a transformative new agenda for maternal health as part of the Sustainable Development Goals (SDGs) whose primary objectives are to reduce the global MMR to less than 70 per 100,000 live births by 2030 (SDG 3.1). WHO indicated that no country should have an MMR higher than 140 per 100,000 live births by 2030. This was based on the momentum generated by Millennium Development 5 (MDG5) (Sama, Takah, Danwe, Melo, Dingwana & Afelo, 2017: 2). Sub-Saharan Africa's maternal mortality ratio is the worst in the world with 640 deaths per 100,000 live births, South Africa included. South African statistics revealed that four million babies die in the first four weeks of life: neonatal deaths. According to the United Nations (2016:4) in the Sustainable Development Goals Report (SDG), between 1990 and 2015, the global maternal mortality ratio declined by 44%. The mortality rate of children under age five fell by more than half, but still, an estimated 5.9 million of children under five died in 2015 mostly from preventable causes. It was confirmed by the National Perinatal Morbidity and Mortality Committee (Napemmc) in South Africa, that causes of perinatal deaths were unexplained stillbirths and intrapartum birth asphyxia across all levels of care (DoH 2014: 8). Almost 50% of these deaths were thought to be probably preventable, and the common problems were with foetal monitoring and the use of the partogram. The committee developed recommendations to reduce perinatal deaths due to intrapartum asphyxia by ensuring that labour is monitored appropriately by skilled birth attendants and the use of a partogram to monitor maternal and foetal conditions according to set standards (DoH, 2014: 54).

The NCCEMD fifth report released in June 2012 indicated that maternal mortality has increased than in any of the previous years (DoH, 2012: v). All these reports described the magnitude of the problem of maternal deaths, the pattern of this disease-causing maternal mortality, avoidable factors, missed opportunities and substandard care related to these deaths and made recommendations concerning ways of decreasing the number of maternal deaths (DoH, 2012:1). In the report (DoH, 2012:30) the other recommendation is health care worker training, emphasising the skills of safe labour practices; use of and interpretation of the partogram among others. One of the National Department of Health strategies to improve quality of care was recommendation 8: the correct use of the partogram should become a norm in each institution conducting births.

The partogram increases the quality and regularity of all observations on the foetus and the mother in labour and aids early recognition of problems in either party. However, the proportion of healthcare workers and facilities consistently using the partogram is inadequate; this is likely to contribute to the maternal mortality. Midwives need to acquaint themselves with correct utilisation and subsequently interpretation thereof. According to the tenth interim report on Saving Mothers (DoH, 2014:9) Bojanala Platinum districts and others were all in the top 10 places when ranked for the number of deaths, the IMMR for bleeding during or after caesarean section and also the case fatality rate (per 100000 caesarean sections). The same report indicated that the North-West Province had IMMR for obstetric haemorrhage more than 15% above the national average. All these are related to partogram utilisation (DoH, 2014:12). Based on the interim report on Saving Mothers (DoH, 2014:16), it was concluded that improving knowledge, skills, management and leadership needs to be exported to other provinces especially the North-West. The North-West Province has been indicated to be among provinces with fatality rates far above the national average of maternal mortality, Bojanala District being the highest with a ratio of 310 per 100 000 live births (DoH, 2012:1). To that effect, the assessors on confidential enquiries in maternal deaths came up with five recommendations including health worker training whereby the skills for safe labour practice were emphasised by the utilization and interpretation of the partogram. The first WHO partogram or 'composite partogram' has been adopted by the National Department of Health of South Africa and is the one utilized in the Bojanala sub-district of the North-West Province. It contains both a latent and active phase (**Figure 1.1**). The exception is that the action line which is the second timeline is drawn two hours later from the alert line instead of four hours.

1.3 PROBLEM STATEMENT

Midwives are taught how to care for a woman in labour during their education and training, including recording and utilisation of a partogram to monitor the progress of labour, maternal and foetal well-being throughout all stages of labour. Recording aims to identify deviations from the standard, such as prolonged and obstructed labour, which may subject a woman to unnecessary interventions, perinatal mortality as well as maternal mortality. If the partogram is inadequately utilised or not utilised at all, prolonged and obstructed labour may not be diagnosed in time (DoH, 2009:8)

The maternal mortality rate in the North-West Province was 130/100 000 (NWP Health, 2009/2010:18) and it was said to be increasing at an alarming rate. This was highlighted by the member of the executive council of health for the North-West Province in the budget speech and indicated that maternal mortality for the whole Province in 2011 was at 147/100 000 and a high percentage was from Bojanala sub-district. The contributory factors were not highlighted though (SAGI, 2011:3). According to the fourth report on Confidential Enquiries into Maternal Deaths in South Africa, the most frequent health care provider avoidable factors in maternal mortality were a failure to follow standard protocols, poor problem recognition and initial assessment (DoH, 2009:1). According to the tenth interim report on Saving Mothers 2011-2013 (DoH, 2014:9), Bojanala Platinum district was in the top 10 places ranked for the number of maternal deaths where some were related to partogram utilisation (DoH, 2014:12). This report did not indicate further on what were the specific problems related to partogram utilisation. It is important to establish the pattern of partogram utilisation in order to identify and resolve these problems. It was, therefore, vital to formally evaluate partogram utilisation in identified healthcare facilities of Bojanala District

1.4 RESEARCH PURPOSE

The purpose was to evaluate partogram utilisation in selected healthcare facilities of Bojanala District.

1.5 RESEARCH OBJECTIVES

Objective 1: To determine the frequency of recording of admission information

Objective 2: To determine the frequency of recordings during the latent phase of labour

Objective 3: To determine the frequency of recordings during the active phase of labour

Objective 4: To determine the frequency of recordings during the second stage of labour

Objective 5: To determine overall utilisation of partogram in selected health care facilities in Bojanala District.

1.6 HYPOTHESIS

There is poor partogram utilization in Bojanala District

1.7 SIGNIFICANCE OF THE STUDY

The findings from the study may be translated to the development of clinical teaching programmes to be used for the continuous education of midwives. The clinical teaching programme would enhance midwives' competencies in partogram recording and interpretation which could improve maternal and neonatal care thus achieving targets 3.1 and 3.2 of the Sustainable Development Goal 3 (SDG 3). The Sustainable Development Goal 3 is aimed at ensuring the health and well-being of all ages by improving reproductive, maternal and child health. Midwives knowledge and ability to utilise the partogram would enable them to identify early deviations from the norm and institute timely interventions. Therefore, a step in the right direction towards the reduction of global maternal mortality ratio and end preventable neonatal deaths thus achievement of the SDG 3 targets 3.1 and 3.2 by the year 2030.

The implementation of recommendations of this study might also assist in decreasing avoidable perinatal and maternal deaths. Lawsuits related to neonatal and maternal care might decrease thus decreasing the financial burden on the Department of Health and reduce the South African Nursing Council litigations against midwives.

1.8 DEFINITION OF KEY TERMS

Maternal mortality refers to death as a result of pregnancy or childbirth and includes the first six weeks of the puerperium that is usually expressed per 100 000 childbirths (Fraser, Cooper & Nolte, 2010:1028). It is further defined as the death of a woman while pregnant or within 42 days after delivery or after termination of the pregnancy. This definition applies, irrespective of the duration and site of the pregnancy from any cause related to or aggravated by the pregnancy or its management but does not emanate from accidental or incidental causes (DoH, 2015:13).

Maternal outcome refers to an effect or result of an action or event according to the Oxford Advanced Learner's Dictionary of Current English (2010:1034). In this

maternal study, outcome refers to the positive and adverse effects of partogram utilisation during labour.

Neonatal death refers to the death of newborn babies within 28 days of life, divided into the early neonatal death, which is from birth to the seventh-day post-delivery and late neonatal death which is from day eight to the twenty-eighth day (DoH, 2014:7).

Neonatal mortality rate refers to some babies who die in the first 28 days after delivery by all live births in the month and is expressed as a proportion of a thousand (DoH,2009:146).

Neonatal outcome refers to the effect or result of an action or event according to the Oxford Advanced Learner's Dictionary of Current English (2010:1034). Neonatal outcome refers to the positive and adverse results of partogram utilisation during labour.

Partogram/Partograph is a graphic record of the progress of labour that helps caregivers to detect whether labour is regularly progressing or not; it indicates when augmentation of labour is appropriate and assists in recognising cephalo-pelvic disproportion long before labour becomes obstructed (Nolte, 2008:1). In this study, partogram or partograph refers to a composite partograph. The terms are used interchangeably.

Utilisation refers to using for a practical purpose (Oxford Advanced Learner's Dictionary of Current English, 2010:1629). In this study, utilisation refers to plotting or recording the partogram correctly, interpreting to make appropriate decisions and intervene where necessary.

1.9 ARRANGEMENT OF CHAPTERS

Chapter 1: Overview of the study

Chapter 2: Literature Review

Chapter 3: Research Design and Methodology

Chapter 4: Results

Chapter 5: Discussion

Chapter 6: Limitations, Recommendations and Conclusion

1.10 SUMMARY

This chapter presented an in-depth discussion on the background of the study on partogram or partograph utilisation in labour, globally. It also discussed in brief, the history and types of partograms or partographs. The chapter also discussed gaps and problems that exist on partogram utilisation, excellent and adverse outcomes globally, in Africa, Sub-Saharan countries and in South Africa. The problem statement, the purpose of the study, objectives and the hypothesis were presented logically. Definitions of selected keywords were also provided to facilitate the understanding of the context in which the study was conducted. The following chapter will provide more information on the study by reviewing relevant literature on similar studies that inform the present study, highlighting gaps and similarities in partogram utilisation.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is conducted to locate existing similar or related studies that can serve as a basis for the study at hand (Brink, van der Walt & van Rensburg, 2012:67). This section provides a literature review on the evaluation of partogram utilisation in maternity care as experienced by other countries. A literature review is centred on the ideas and findings of other researchers who inspired the current study and also on what is known about the research problem and what is to be further researched. The review is not confined to a specific design of a partogram. In this study, the literature review was attained from textbooks, journal articles, abstracts, government and research reports.

Google scholar and Cochrane reviews were used to identify sources related to partogram utilisation and focused on the following keywords: partogram/partograph, midwives, labour, utilisation, maternal outcomes, and neonatal outcomes from the literature that is ten years and less: 2010 to 2017. The literature reviewed is indicated in Table 2.1 below. In this study, the literature review covered the following:

- To determine the frequency of recording of admission information
- To determine the frequency of recordings during the latent
- To determine the frequency of recordings during the active phases of labour
- To determine the frequency of recordings during the second stage of labour
- To determine overall utilisation of partogram in selected health care facilities in Bojanala District

Table 2.1 Literature reviewed

Author(s)	Title	Objective (s)	Outcomes	Gaps
Abebe, F., Birhanu, D., Awoke, W. & Ejigu, T.2013	Assessment of knowledge and utilisation of the partogram among health professionals in Amhara region, Ethiopia.	- To assess the level of knowledge of the partogram and its utilisation	The study revealed that participants' level of partogram utilisation was deplorable.	- Results could not be generalised as the sample was shallow. - The inclusion of private health care providers would have given a comprehensive picture and made generalisation possible.
Adesola, O., Omolola, I., Adekemi, O.& Audu, O.2014	Partogram utilisation at Three levels of HealthCare delivery services in Llefe-lfe, Nigeria	- The study was designed to identify the extent of use of partogram by obstetric staff, assess to correct partogram charting on case files of delivered mothers, and identify factors influencing the use of partogram	The use of the partogram by obstetric staff is still at a low ebb in primary, secondary and tertiary healthcare institutions.	- A small sample size of the obstetric staff that limits the generalisation of the findings from this study. - A retrospective design was adopted and had an impact on the outcomes of this study; a prospective study would have been conducted.
Aguiar, C.A., Gonçalves, R.	Use of the partogram in labour: Analysis of	- To compare and identify possible	The finding implies that, regardless of the	- Data were collected from the medical records of 112 mothers

&Tanaka, A.C.A.2014	its application in different care models	differences in the use of the partogram in different models of delivery and birth care	care model, the partogram has been used bureaucratically and not as a guiding instrument of assistance envisioning safely and timely practices	with low obstetric risk; it could have produced a comprehensive picture if women with moderate to high obstetric risks were included in the study. - Furthermore, results could not be generalised as the study was conducted at two hospitals only
Asibong, U., Okokon, I.B., Agan, T.U., Oku, A.O., Opia, M.M, Essien, E.K. & Monjok, E.2014	The use of partogram in labour monitoring: a cross-sectional study among obstetric care givers in General Hospital, Calabar, Cross River State, Nigeria	- To determine the knowledge and utilisation of the partogram in the three levels of healthcare in Calabar, Nigeria	The study revealed that partogram use could reduce maternal mortality significantly and child mortality	- The self-administered questionnaire could lead to distortions, and the participants might have given answers that are needed by the researcher - A comparative analysis of primary, secondary, and tertiary institutions would have been ideal - The purposive sampling also was not relevant in this study as this might affect generalizability
Bazirete, O. 2014	Utilisation of partogram among nurses and	- To assess knowledge and use of partogram	Despite the excellent partogram knowledge	- The quantitative design used could not describe factors

	midwives in Rwamagana Health Facilities in the Eastern Province of Rwanda	among nurses and midwives in Rwamagana health facilities - To identify the challenges facing nurses and midwives with regard to the utilisation of partogram in the health facilities and - To determine factors influencing the use of partogram among nurses and midwives in Rwamagana health facilities	of nurses and midwives in this study, only 41.22% of respondents were reported to have appropriately used the partogram, 58.78% reported not to utilise it properly	affecting the utilisation of partogram, generated data that could not assess the quality in documenting the partogram and determine the outcomes of the mother and the newborn. - Data collection was done with the aid of a self-administered questionnaire, which might have led to biases; checklist would have been a suitable way of data collection. - A small sample size of 131 participants from 15 institutions is insufficient, and results could not be generalised
Bor, R.K.2010.	Use of the partogram and obstetric outcomes in Kajiado district hospital.	- To assess the quality of intrapartum care and obstetric outcomes	Quality of partogram utilisation was low, and not all 207 partograms were reviewed	- Results could not be generalised as the study was conducted at a district hospital only and the design of partogram was not

				indicated. - This was a retrospective study in which patient delivery records were used to assess the quality of care as such the quality of record keeping had an impact on the outcomes of this study.
Egbe,T.O.,Ncham,E. N.,Takang,w.,Egbe,E. N. & Halle- Kane,G.D.2016	Use of the partogram in the Bamenda Health District, North- West Region, Cameroon: A cross- sectional study	- To establish and compare the proportion of labour cases followed up with the partogram in primary and secondary healthcare facilities in the Bamenda Health District and appraise the attitudes of the health workers towards the partogram and how those attitudes impact outcomes	The health workers had a positive attitude towards the partogram, but on the whole, it was incorrectly used. The instrument was for the most part unavailable, and even where it was available, inadequate supervision and absence of guidelines on its use led to poor diagnoses	- The study did not analyse information such as urinalysis, medications and fluids administered during labour but involved review of records already filled and as such may not give a real picture of what was practised since filling the partogram does not necessarily mean using it to monitor the progress of labour only however, all parameters pertaining to maternal conditions should be monitored as well

Fawole, A.O., Shah,A., Fabanwo,A.O., Adegbola, O., Adewunmi, A.A., Eniayewun,A.B., Dara, K., El-Ladan, A.M., Umezulike,A.C., Alu, F.E., Adebayo, A.A., Obaitan, F.O., Onala, O.E.,Usman, Y., Sullayman, A.O., Kailani, S & Sa'id, M.2012.	Predictors of maternal mortality in institutional deliveries in Nigeria	- To determine risk factors for maternal mortality in institutional births in Nigeria.	There were 79 maternal deaths and 8 526 live births, giving a maternal mortality ratio of 927 maternal deaths per 100 000 live births. No antenatal care, lack of Intrapartum care (partogram), parity, level of education, and mode of delivery were significantly associated with maternal mortality	- The study could not specify the number of maternal deaths due to partogram use or non-use - Reviewing medical records was insufficient as challenges by partogram users could not be identified and some information in the records was missing.
Gans-Lartey, F., O'Brien, B.A., OwareGyekye, F & Dschofliche, D.2012	The relationship between the use of the partogram and birth outcomes at Korle-Bu Teaching Hospital	- To evaluate the relationship between adequate use of the partogram and labour and maternal/newborn outcomes	Partograms were adequately completed by WHO guidelines only 25.6% (472) of the time, and some data appeared to be	- Findings could not be generalised as the study was only undertaken at one hospital. - A prospective study would have been conducted so that more control could be maintained

			entered retrospectively. Partogram use was associated with less maternal blood loss and neonatal injuries. When the action line was crossed (464), timely action was taken only 48.7% of the time and was associated with less assisted delivery and a fewer low Apgar scores and NICU admissions	instead of a retrospective study. - The relationship between adequacy of partogram use and maternal/neonatal mortality could not be assessed as some of the information was missing from some files; therefore the study objective was not met
Jere, J.A.2014	Use of partograms in women in labour at Mulanje District Hospital in Malawi	- To document the proportion of deliveries in which a partogram was used. - To assess whether	The study showed that although partograms were available in women's files, the partogram data were	- The study was done in only one district hospital; the findings could not be generalised to all hospitals in Malawi. - The study was conducted in one

		health care workers documented the following thoroughly: • Foetal condition (foetal heart rate, the colour of liquor and moulding). • Maternal condition (blood pressure, pulse rate, temperature, urine output and use of oxytocin). • The progress of labour (descent, cervical dilatation and contractions). - To assess the mode of delivery, maternal outcome (post-partum haemorrhage, ruptured uterus, maternal death) and foetal outcomes	not completed adequately. While the progress of labour was frequently documented, maternal and foetal conditions were incompletely documented	month only, maternal and foetal outcome that occurred during the month of study might be different from outcomes of deliveries over a more extended period
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		(Apgar score, death) of cases of women who crossed the action line - To compare the mode of delivery, maternal and foetal outcomes among women that were referred from the primary care health centres to the district hospital and women that came directly to the district hospital when labour commenced		
Kabkyenga, Ostergren, Turakira, Mukasa & Petterson 2011.	Individual and health facility factors and the risk for obstructed labour and its adverse outcomes in south-western Uganda.	- To investigate the role of individual and health facility factors and the risk for obstructed labour and its adverse outcomes in south-	Overall the perinatal mortality rate was 74 per 1000 total births and only 19 (3.5%) partograms were satisfyingly	- In this study, results can be generalised as the sample size was unequal in all institution implying that there could have been bias on the researcher's side.

		western Uganda.	documented; 13 in Comboni Hospital, 4 in Mbarara Regional Referral Hospital, 1 in Kitagata Hospital and one in Rushere Community Hospital.	- Reviewing of records alone was not sufficient; face-to-face interviews would have yielded better results.
Kip, J.P 2013.	The prevalence of obstructed labour among pregnant women at a selected hospital, West Wollega, Ethiopia.	- To identify and describe the complications of obstructed labour in Gimbie Zone, West-Wollega, Ethiopia.	The findings showed that poor documentation in general and very sporadic use of the partogram, in particular, contributed significantly to the complications for the mother and child. Most parameters on the partogram were not monitored, and most healthcare workers did	- The study was limited to a small sample as it was identified the data were collected at only one site with a meagre number of cases over a period of 1 year only. As a result, findings of this study could not be generalized to the general population. - Since the study design was retrospective, there might have been bias due to the issues of missing or unrecorded variables in patients' files, ANC cards and operating theatre.

			not document their findings on the partogram after reviewing the progress of women in labour.	- Interviews would have yielded better results.
Kitila, S., B., Gmariam, A., Molla, A. & Nemera, G 2014	Utilisation of partogram during labour and birth outcomes at Jimma University	- To identify the extent of utilisation of partogram and birth outcomes at Jimma University Specialised Hospital	The study concluded that utilisation of the partogram during labour, documentation of the critical events of poor labour and birth outcomes were strictly associated	- Records were selected by systematic sampling method with the possibilities of bias as sample selection may not be truly representative of the population under study. - The study was conducted at one hospital for a very long period with a small sample size, and a conclusion can therefore not be made as utilisation might be different in other facilities
Khonje, M. 2012	A cross-sectional study on the use and documentation of partogram and factors	- To assess the use of the partogram and its effects on the maternal and foetal outcomes	The analysis of the quantitative data showed that the partogram was	- This study-generated data that could not assess the quality in documenting the partogram. - A retrospective review of the

	that prevent optimal utilisation of the partogram. Perspectives of health workers at Bwaila and Ethel Mutharika maternity units in Lilongwe, Malawi		improperly utilised. The qualitative component demonstrated that the barriers to using of the partogram included shortage of staff with high workload, negligence, inadequate supervision and lack of motivation	partogram was conducted in which some findings were difficult to understand. A prospective review of partograms could be best to understand the complexities of using the partogram than a retrospective study
Konlan, K.M., Kombat, J.M., Wuffele, M.G. & Aarah-Bapuah, M 2016	Knowledge and attitudes of midwives on the use of the partogram: a study among midwives in the Tamale Metropolis	- To assess the knowledge level of midwives on the efficient use of the partogram in monitoring the progress of labour in the Tamale Metropolis of Ghana	The results of the study revealed an inadequate knowledge on how to plot information on the partogram, particularly the symbols used	- The study was conducted at three hospitals with only 140 midwives using a questionnaire where bias was a possibility instead of face-to-face interviews and a checklist. - It would have yielded better results if a more extensive sample was used and if partograms were also reviewed
Kushwah, B., Singh,	The partogram: an	- To revisit the basic	Nearly three-fifths of	- The setting and sample size of

A.P. & Singh, S 2013	essential yet underutilised tool	practices by revitalisation of partogram	the maternal deaths (204,000) occurred in the sub-Saharan Africa region alone, followed by South Asia (109,000). Thus, Sub-Saharan Africa and South Asia accounted for 87% (313,000) of global maternal deaths	this review was not indicated making it difficult to generalise findings to Sub-Saharan Africa and South Asia
Lumadi, T. G.2014	Intrapartum clinical guideline for monitoring and managing a woman during labour	- To analyse documentation of the partogram in the labour ward - To explore the experiences of midwives in the implementation of a partogram as a guideline during labour	The findings of the study revealed gaps in recording, mostly on aspects that needed frequent observations and on aspects in which resources needed to be used in monitoring were lacking	- The study was conducted at three hospitals where findings could not be generalised because of the small sample size. - The interview process rendered some participants anxious with the realisation of being recorded. As a result, the researcher took notes while interviewing leading to bias - Findings of this study could not produce an accurate picture as in

				one of the hospital's lack of Uristix for doing urinalysis lead to gaps on the recording
Lavender, T., Hart, A. & Smyth, R.M. 2013	Effect of partogram uses on outcomes for women in spontaneous labour at term” Cochrane database systematic review	- To determine the effect of the use of partogram on perinatal and maternal morbidity and mortality. - To determine the effects of partogram design on perinatal and maternal morbidity and mortality	There was no evidence of any difference between partogram and no partogram in caesarean section; instrumental vaginal delivery or Apgar score less than seven at five minutes	- The study used only six reviews which were insufficient, and it was only a single centre study which could not be generalised
Maina, R. M.Mutunga-Mwenda, C. & Karonjo, J.2016.	Utilisation of the partogram among nurse-midwives at a county referral hospital in Kenya.	- To assess partogram utilisation among nurse-midwives in the maternity unit of Coast General Hospital, Mombasa.	The study found that nurse-midwives’ knowledge has positive significance on the utilisation of partogram P-value= 0.000. Level of Partogram utilisation	- Self-administered questionnaire and a checklist for the sampled file was used where there were possibilities of distortions, participants providing answers that were preferred by the researcher and the occurrence of bias.

			was found to be significant with a P-value= 0.000< 0.05. High perception of nurse-midwives' on utilisation of partogram was significant with a P-value=0.000<0.05.	
Maphasha, O.M., Govender, I., Motloba, D.P. & Barua, C.2017	Use of the partogram by doctors and midwives at Odi District Hospital, Gauteng, South Africa	To investigate knowledge of and use of the partogram among doctors and midwives at Odi District Hospital	Overall knowledge of partograms was insufficient, resulting in the inadequate use of partograms. Reasons for not using the partogram included being unsure of how to use it (13%), partogram charts not available (8.7%), partogram takes too long (21.7%), being	- The small sample size predisposed findings of this study to random error; - A self-administered questionnaire was used for data collection, and this might have led to bias; checklist would have been a suitable way for data collection. - Interviewing doctors and midwives is not evidence enough of partogram use, but having to review records would have produced better results.

			too busy (26.1%), and a feeling that the partogram was not the doctor's responsibility (26.1%)	- The study revealed one of the findings as unavailability of the partogram in the unit; this is mandatory in South Africa that all women in labour should be monitored using a partogram
Markos, D. & Bogale, D.2016	Knowledge and utilisation of partogram among health care professionals in public health institutions of Bale Zone, Southeast Ethiopia	- To assess knowledge and utilisation of partogram among health care professionals in public health institutions of Bale Zone, Southeast Ethiopia	One hundred and forty (38.5%) and 224 (61.5%) study subjects have a weak and right level of knowledge about partogram, respectively. The magnitude of partogram utilisation was 70.2%. Variables having statistically significant association with a reasonable level of knowledge about partogram were	- A self-report was used to assess utilisation, and this led to an inability to establish cause and effect relationship in partogram utilisation instead of using a checklist. - Socially desirable bias was possible when reporting on the question that asked about the utilisation of partogram because professionals may have felt shame to respond with a 'no' under the utilisation question in this current situation where great emphasis for maternal health is

			midwives	provided
Markos, M. 2017.	Partogram utilisation and associated factors among obstetric care providers in public health institutions of Wolaita Zone, SNNPR, Ethiopia.	- To assess the magnitude of partogram utilisation and factors that affects its utilisation among obstetric care givers in public health institutions of Wolaita Zone, SNNPR, Ethiopia.	269 (97.8%) Obstetric caregivers participated in the study. Of those who were utilising partogram 193 (71.1%) used, routinely for all labouring mothers and 76(28.3%) of the participants reported that they do not utilise it routinely.	- Small sample size hampers the precision of some associations. - Since information about partogram utilisation was obtained from respondents through self-administered questionnaires, rather than observation; response bias and social desirability bias could have occurred.
Masika, M.A., Katongole, S.P., & Govule, P.2015	Improving partogram documentation and use by health workers of Bwera Hospital: A process improvement research	- To increase the percentage of - mothers monitored in labour by the correct documentation and use of the partogram	Monitoring of mothers through correct documentation and use of the partogram at the maternity department improved to 89.3%. Marked changes were realised in attaching	- Findings could not be generalised as the study was conducted at one hospital - Findings could not reflect a comprehensive picture as the process of change strategies did not achieve the desired results in some indicators such as taking and recording of the pulse, taking

			partograms on clients' files from 96% to 99%, and reduction of partograms left blank went from 8% to 3%	of blood pressure of the clients and monitoring of the colour of the liquor
Mathibe-Neke, J. M., Lebeko, F. L. & Motupa, B.2013	The partogram: A labour management tool or a midwifery record?	- To establish the perception of the use of the partogram by midwives, - To establish and describe the factors that contribute to the underutilisation of the partogram by midwives during the management of labour	The findings revealed that midwives understood the importance of the use of the partogram but do not efficiently use it due to some factors	- The study was conducted at one hospital where findings cannot be generalised and also because of the small sample size. Findings would be more productive if a larger scope were used - Questionnaires used to collect data could have led to distortions and bias where participants would respond positively to what was desired by the researchers. - Auditing of the partograms would have produced more useful data
Mdoe, P. F.2012	Quality of partogram recordings and perinatal outcomes at	- This study aimed at assessing the quality of partogram recordings	1,051 Partograms were reviewed during the study time. Only	- The sample size in this study was not indicated, this implies that even fewer records could have

	Muhimbili National Hospital, Tanzania	and compare with foetal outcomes among women delivering at Muhimbili National Hospital	8.9% of partograms had all parameters with standard recordings. Substandard recordings of foetal heart rate and uterine contractions were significantly associated with adverse foetal outcomes	been reviewed, compromising generalisability over the study being conducted at one hospital - Reviewing records using a checklist could have given incomplete information as some parameters were not recorded
Moalusi, O.2011	Clinical outcomes and practices in the maternity unit of a district hospital	- To describe the clinical outcomes and the associated clinical practices in the maternity unit of the hospital - To describe the completeness of partograms during the study period according	The study revealed that there was inadequate recording regarding the clinical notes using the partogram. No partogram that was reviewed for the study was completed according to standard	- A retrospective review of the records of deliveries affected findings of this study, challenges of midwives and health care workers do not know regarding the completion of the partogram. A face-to-face interview would have provided comprehensive results. - Findings of this study may not

		to the World Health Organisation standards		represent all hospitals in North-West Province of South Africa as it was conducted at one hospital only. The sample size was also not indicated
Mulondo, S.A.,Khoza, L.B. & Risenga,R.P.2013.	Competence of midwives about prevention of low Apgar Scores among neonates. International Journal of research in medical and health sciences.	- To establish the extent of the competence of midwives regarding the prevention of low Apgar scores among neonates	The findings revealed that midwives perceived themselves to be competent in performing most midwifery skills, but incompetent in performing some critical skills related to midwifery care, such as taking and recording blood pressure correctly	- Data collection was conducted with the aid of a self-administered questionnaire, which might have led to bias; a checklist would have been a suitable way of data collection. - The results cannot be generalised, as the sample was purposive instead of simple random sampling. - The study was conducted in three districts of Limpopo Province. Therefore, results could not be generalised.
Okokon,I.B.,Oku,A.O. ,Agan,T.U.,Asibong,U	An evaluation of the knowledge and	- To determine the knowledge and	The study revealed that partogram use	- The study could not be generalised as private hospitals

.E, Essien,E.K. & Monjok,E.2014.	utilisation of partogram in primary, secondary and tertiary care setting in Calabar, South-South Nigeria	utilisation of the partogram in the three levels of healthcare in Calabar, Nigeria.	could reduce maternal and child mortality significantly	were excluded. - Self-administered questionnaire might have led to distortions - There could have been social desirability bias because the participants might have given answers that are needed by the researchers.
Opia, M.M, Of, A.B, Essiene.K & Monjok, E.2012.	Knowledge and utilisation of the partogram among midwives in the Niger Delta Region of Nigeria	- To determine midwives' knowledge about the use of the partogram during labour, - To compare the extent of use of the partogram among hospitals, - To identify level of utilisation in each centre, - To identify factors that hinder its use.	Results revealed that 84% of midwives knew what the partogram was and 92.7% indicated that the use of the partogram reduces maternal and child mortality	- The possibilities of bias were found to be high due to the small sample size of midwives and that the study was conducted at selected tertiary level hospitals. - The study could not be generalised as it excluded midwives working in primary health care maternity units, secondary healthcare general or community or cottage

				hospitals and private health institutions.
Opoku & Nguah.2015.	Utilisation of the modified WHO partogram in assessing the progress of labour in a metropolitan area in Ghana	- The study was conducted to ascertain the proportion and correct use of the partogram in monitoring labours in four hospitals in a metropolitan area of Ghana.	The study revealed that almost half of labour cases were not monitored using the partogram.	- The study assessed only the completion of the parameters of the partogram during labour and not whether partogram completion was translated into labour management that is vital in maternity care. - Completion may not necessarily mean use and the findings of the present study did not show the extent of use of the partogram for monitoring the progress of labour in the health facilities. - A small sample was used thus affecting generalizability.
Podder, M. & Tayade, S.2016.	Is partogram being correctly filled or just giving false security?	- To determine whether the partograms are correctly being filled. - To find out which part	The study revealed significant proportions of substandard and unrecorded	- The study retrospectively assessed the appropriate completion of the parameters of the partogram during labour;

		of the partogram is not being adequately filled.	parameters of labour on the modified WHO partogram. This indicates poor documentation, and perhaps monitoring and supervision of labour	moreover, completion may not necessarily mean use, so the findings of the present study could not precisely reflect on the extent of use of the partogram for monitoring labour progress. - This study was confined to rural health facilities of Maharashtra; the findings may not be generalizable to all public and private health facilities.
Qureshi, Z.P., Sekadde-Kigundu, C.& Mutiso, S.M. 2010.	Rapid assessment of partogram utilisation in selected maternity units in Kenya.	- To determine the utilisation of the partogram in the management of labour in selected health facilities	The study revealed poor record keeping, such as incomplete recording of partograms	- Facilities were randomly selected including private hospital, and a convenient sampling was used for rapid assessment, simple random sampling could have been used for generalisation of findings. - Findings of this study are not different from other studies and in this study findings cannot be generalised even though mixed

				method approaches were utilised for data collection.
Rani, U & Laxmi, B.V.2016.	Effect of partogram monitoring on outcomes for women in spontaneous labour at term. IAIM, 2016; 3(7): 314-320	- To determine if routine partogram monitoring of spontaneous labour will optimise the maternal and foetal outcome	The study revealed that the routine use of the partogram is helpful in detecting abnormalities in the progress of labour and permits early corrective therapy	- Findings of this study could not be generalised as it was conducted at one hospital over a period of two years with a small sample for that period.
Rachhoya, P. & Barolia, D.K.2015.	Universal acceptance of the partogram	- To prospectively evaluate the progress of labour in nulliparous and multiparous using WHO modified partogram: - To promote further research into its use and benefits, mainly as a referral tool. - To determine the effect	92% patients were having spontaneous onset of labour while 7.1% patients required induction of labour. Induction was done in 3.9% patients due to postdatism, in 1.1% patients due to prolonged latent phase and in 2.1% patients	- Findings of the study did not meet all objectives, as there was no report on objectives as indicated. The sampling method was not indicated making it impossible to conclude that the findings could be generalised. - The study was about a WHO modified type of a partogram which is without the latent phase of labour, but had results of the

		of the use of partogram on the frequency of prolonged labour, augmented labour, operative deliveries and whether appropriate interventions based on partogram will reduce perinatal and maternal morbidity and mortality. - . Monitoring the progress of labour and well-being of mother and foetus - Recognising the need for action at the appropriate time.	due to (PROM) premature rupture of membrane. 24 babies had an Apgar score less than seven, among which 22 were sifted to NICU for reasons of meconium aspiration 12, respiratory distress 7 and birth asphyxia 3.	prolonged latent phase of eleven (11) participants; this could only be possible with a composite type of a partogram.
Salama, N. S., Abdallah, I. M. & Heeba, M.F.2010	The Partogram: Knowledge, attitude, and utilisation by professional birth	- To assess the existing knowledge, attitude and practice of professional birth attendants	Results of the study revealed that the majority of nurses (91.3%) had an	- A convenience sample of 103 was small from eight health care facilities. Random sampling could have been used to generalise

	attendances in Port-Said and Ismailia Cities	(nurses/physicians) regarding the use of partogram as well as to explore the factors limiting its use in the Health Centres and District Hospitals in Port-Said and Ismailia cities	unsatisfactory score of knowledge regarding using of partogram, while more than half of physicians (55.9%) had a satisfactory score	findings. - The study showed that it was not an obligation to use partogram for monitoring women during labour whereas this was and is a requirement and recommendation by the World Health Organisation.
Sama, C.B., Takah, N. F., Danwe, V. K., Melo, U. F., Dingana, T. N. & Angwafo, F.F.2017	Knowledge and utilisation of the partogram: A cross-sectional survey among obstetric care providers in urban referral public health institutions in northwest and southwest Cameroon	- To identify factors associated with proper knowledge and routine utilisation of the partogram	Less than one-third (29.6%) of the respondents had good knowledge on the partogram and only 23 (32.4%) routinely used it in monitoring labour. The knowledge and use of the partogram in this study is sub-optimal	- Obstetric care providers in public health centres, private and faith-based health institutions, as well as those in rural public health institutions within these regions were not included therefore results could not be generalised. - The small sample size also affected generalisability - The could have been a tendency for social desirability bias whereby

				respondents might be inclined towards giving answers they feel were desirable to the researchers.
Sarsam, S., Flayeh, R.M. & Alnakkash, U.M.2014.	The implication of the two WHO Partograms, (Composite and Simplified) Regarding maternal and Neonatal Outcome.	- To compare two World Health Organisation (WHO) Partograms, the composite Partogram including the latent phase with the simplified one without latent phase regarding maternal and foetal outcomes.	Caesarean section was more in cases monitored with composite Partogram (P-value <0.001). Admission to the neonatal care unit was more in cases of composite Partogram group, whether the patients were nulliparous or multiparous, the difference was statically significant (p<0.005)	- The study should have compared equal numbers of both partograms, but instead, 340 were monitored with composite partogram, and 330 were monitored with simplified partogram, bias was identified in this study it appeared like the researcher prefers the simplified over the composite one. - The study was confined to one teaching hospital where results could not be generalised
Shokane, M. A.2011.	The utilisation of the	- The objectives of the	The results of the	- The findings of the study cannot

	partogram by Midwives in Lebowakgomo and Zebediela Level 1 Hospitals in the Capricorn District of the Limpopo Province, South Africa	study were to explore and describe the utilisation of the partogram by midwives when monitoring labour in Lebowakgomo and Zebediela level 1 Hospitals in the Capricorn District of the Limpopo Province and to develop guidelines.	study showed that participants were not monitoring foetal status during the latent and active phases of labour	be generalised because the research was conducted in only two hospitals and the study only indicated that interviews were conducted until data were saturated, not indicating at what level were data saturated resulting in researcher bias. - A quantitative study would have given an accurate picture of partogram utilisation.
Singh, R.2013.	A description of the utilisation the partogram by midwives in the public hospitals in the UMgungundlovu District, KwaZulu-Natal	- The objectives of the study were to: Assess midwives' knowledge and competence on the use of the partogram during labour, establish if there is organisational support for the use of the partogram and identify factors that	The results revealed that there were specific parameters that were given more focus when it came to correct and consistent recording, such as contractions (80.0%) and cervical dilatation (89%) while others were poorly	- Purposive selection of the public hospitals may have some bias as the selected hospitals were district and regional hospitals only, and midwives working in the primary health care setting were left out. - Observation of midwives plotting on the partogram in the real work situation was not done. The study should have included interviews

		affect the use of the partogram by midwives.	done, such as the duration of labour (13.5%), pain relief (23.5%) and unrecorded partograms from the primary health care clinics and community health centres (80.8%).	with the midwives to explore their challenges in-depth.
Tayade, S. & Jadhao, P.2012.	The Impact of Modified WHO partogram on maternal and perinatal outcome	- To determine if, among low-risk labouring women, the use of modified WHO partogram resulted in reduced maternal and perinatal morbidity	The emergency caesarean section rate was reduced from 44% in controls to 21% in cases (p-value<0.05). None of the cases had labour beyond 12 hours, thus indicating a significant reduction in prolonged labour. Neonatal intensive	- Findings could not be generalised as the study was conducted at one teaching hospital. - The study retrospectively assessed the appropriate completion of the parameters of the partogram during labour; and completion may not necessarily mean use, so the findings of the present study could not reflect the impact of partogram on perinatal

			care admissions decreased from 17% in controls to 6% in cases indicating an improved maternal & neonatal outcome	and maternal outcomes
Ubaid,F., Shukar-uddin, S., Sadaf, N. & Soomro, N.2013.	Partogram depicted labour dysfunction and fetal-maternal outcome in primigravidas. Journal of Surgery Pakistan (International) 18 (1).	- To determine the frequency of labour dysfunction and associated fetal-maternal outcome in primigravidas	Findings revealed that out of total patients, 82% neonates were observed with good Apgar score and 18% had reduced Apgar score. There were 2% cases of puerperal pyrexia but no case of PPH, ruptured uterus and obstructed labour	- Findings could not be generalised as the study was conducted at one institution with a small sample size. - The study focused on primigravidae only with a singleton pregnancy; it could have yielded significant results if multigravidas were also included in the study and even those with multiple pregnancies.
Verla, T. Y. N., Ojong-Alasia, M. M., Sama, J. D., Tumasang, E. N., Ndipowa, J. C. & Atanga, M. B. S.	Various health care providers' knowledge of the partogram use during childbirth, at the	- To assess the existing knowledge and relationship between trained and untrained	Major findings indicated a reasonable level of knowledge (61.8%).	-The study used self-administered questionnaire, records review and interviews for data collection. The self-administered questionnaire might

2017.	Bamenda Health District, Cameroon	birth attendants (BAs) regarding the use of the partogram in nine public health facilities in Mezam Division, North-West Region, Cameroon.	Statistical relationships were found between professional level and knowledge on the use of the partogram, and knowledge and training on the use of the tool	have led to bias and participants could have responded to what was desired by the researchers. In interviews, participants might have provided socially acceptable responses, and interviewers might have misinterpreted participants' non-verbal behaviours. An observational study would have provided comprehensive results.
Wakgari, N., Amano, A., Berta, M. & Tessema, G. A.2015.	Partogram utilisation and associated factors among obstetric care providers in North Shoa Zone, Central Ethiopia: a cross-sectional study	- To assess the level of partogram utilisation and its associated factors among obstetric care providers in North Shoa Zone, central Ethiopia	Partogram utilisation in this study was found to be low. Being a midwife by profession, on job training, knowledge and attitude of obstetric care providers were factors affecting partogram utilisation	- Information about partogram utilisation was obtained from respondents through self-administered questionnaires, rather than observation, so bias and social desirability bias was possible.
Weerasekara, D.	Usefulness of a	- To compare usefulness	At present evidence	- The study is not consistent with

2014	partogram to improve outcomes: Scientific evidence	of partogram with no partogram outcomes	from studies comparing partogram with no partogram shows no difference in caesarean section rates, duration of labour, oxytocin augmentation, amniotomy, epidural use, and use of antibiotics in labour, Apgar scores or admissions to the neonatal intensive care unit	other studies as evidence of these two trials; it cannot be recommended that maintaining partogram is mandatory in labour. Therefore findings of this study could not be generalised
Yisma, E., Dessalegn, B., Astatkie, A. & Fesseha, N. 2013.	Knowledge and utilisation of partogram among obstetric care givers in public health institutions of Addis	- To examine knowledge and utilisation of partogram among obstetric care givers in public health	The study revealed that the use of WHO modified partogram to monitor women in labour in public health	- Data was collected using interviewer-administered questionnaire with the possibilities of social desirability bias, which may cause the obstetric

	Ababa, Ethiopia	institutions.	institutions was reported significantly more frequently by respondents in the health centres compared with the respondents from hospitals.	caregivers who took part in this study to overstate their use of the partogram. - The study was confined to obstetric caregivers working in public health facilities of Addis Ababa, Ethiopia, the findings may not be generalizable to obstetric caregivers working in private health facilities as well as in public and private health facilities out of Addis Ababa. - The small sample size may make estimates unstable and associations between dependent and independent variables undetectable - The data collection tool did not indicate the partograms parameters that were assessed as well as parameters of progress of
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				labour which were said to be of substandard care
Yisma,E.,Dessalegn, B., Astatkie,A. & Fesseha,N.2013	Completion of the modified WHO partogram during labour in public health institutions of Addis Ababa, Ethiopia	- To assess the completion of the modified WHO partogram during labour in public health institutions of Addis Ababa	The study revealed that the correct completion of the partogram was very poor and the study revealed high proportions of unrecorded parameters of labour on the modified WHO partogram and substandard monitoring of the progress of labour	- The findings may not be generalizable to obstetric caregivers working in private health facilities as well as in public and private health facilities out of Addis Ababa. - The study assessed only the completion of the parameters of the partogram during labour and completion may not necessarily mean use, the findings of the study could not show the extent of use of the partogram for monitoring labour progress - The study could not assess documentation of results of biochemical tests on the modified WHO partograms such as tests of urine for abnormalities such as

				sugar, as the maternal condition is also vital during labour monitoring by the use of all types of partograms
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2.2 THE USE OF PARTOGRAM IN SELECTED HEALTH CARE FACILITIES

The partogram is used to provide an overview of the progress of labour, to alert midwives and obstetricians of deviations in maternal and foetal well-being and the progress of labour (Orhue, Aziken and Osemwenkha, 2012:1-8). Labour is diagnosed if there are persistent painful uterine contractions accompanied by at least one of the following: change in cervical effacement and dilatation, rupture of membranes and show (DoH, 2015:46). Labour is divided into latent and active phases. The latent phase is diagnosed when the woman is in labour; the cervix is <4 cm dilated and ≥ 1 cm long. The active phase is when the woman is in labour; the cervix is ≥ 4 cm dilated and < 1 cm long (DoH, 2015:46). The latent phase of labour lasts for eight hours or less. In the active phase, a multipara woman is expected to dilate 1.5cm per hour and a primigravida to dilate at least 1cm per hour.

The standard monitoring and essential care /interventions during the latent and active phases of labour in table 2.2 are recorded in the partogram. (DoH, 2015:48). Any change in phase of labour or abnormal observation warrants more frequent observation or action. Figure 1.1 below illustrates the Partogram/Partograph that is used in all maternity health services in South Africa.

Figure 1.1: WHO Composite Partogram- South African Version

Name:		Gravidity:		Parity:		Gestation:		Spontaneous labour		Induced labour	
Age:		Risk Factors:						Time of ROM:			
Pavlo:								Duration of labour (on arrival):			

Date:		LATENT PHASE										Date:										ACTIVE PHASE									
Time																															
Duration in hours																															
FETAL CONDITION	First heart rate																														
	O = before contraction																														
	E = after contraction																														
	180																														
	160																														
	140																														
	120																														
	100																														
	80																														
	60																														
FVL/N																															
Descent/Station																															
Apex/Station																															
Presenting part																															
Cepus																															
Moulding																															
PROGRESS OF LABOUR	Proton e.g. LGA																														
	12																														
	10																														
	8																														
	6																														
	4																														
	2																														
	0																														
	Head above pelvis																														
	Cervical dilation																														
Cervical length																															
CONTRACTIONS PER 10 MINUTES																															
4-5 sec																															
3-4 sec																															
2-3 sec																															
1-2 sec																															
FETAL POSITION																															
BLOOD PRESSURE & PULSE																															
300																															
250																															
200																															
150																															
100																															
50																															
0																															
URINE																															
Volume																															
Protein																															
Ketones																															
Blood																															
Glucose																															
TEMPERATURE °C																															
TIME																															
MANAGEMENT/ MEDICATION/ I.V. FLUID																															
PAIN RELIEF																															
SIGNATURE & RANK																															

* Abnormal: 0 = 1+ 3+ 4+ * Caput: 0 1+ 2+ * Station: 1 = mid 2 = low 3 = high 4 = not reached * Presenting part: Crown = Br Face = F * Version: 1 = 10 2 = 11 3 = 12 4 = 13 5 = 14 6 = 15 7 = 16 8 = 17 9 = 18 10 = 19 11 = 20 12 = 21 13 = 22 14 = 23 15 = 24 16 = 25 17 = 26 18 = 27 19 = 28 20 = 29 21 = 30 22 = 31 23 = 32 24 = 33 25 = 34 26 = 35 27 = 36 28 = 37 29 = 38 30 = 39 31 = 40 32 = 41 33 = 42 34 = 43 35 = 44 36 = 45 37 = 46 38 = 47 39 = 48 40 = 49 41 = 50 42 = 51 43 = 52 44 = 53 45 = 54 46 = 55 47 = 56 48 = 57 49 = 58 50 = 59 51 = 60 52 = 61 53 = 62 54 = 63 55 = 64 56 = 65 57 = 66 58 = 67 59 = 68 60 = 69 61 = 70 62 = 71 63 = 72 64 = 73 65 = 74 66 = 75 67 = 76 68 = 77 69 = 78 70 = 79 71 = 80 72 = 81 73 = 82 74 = 83 75 = 84 76 = 85 77 = 86 78 = 87 79 = 88 80 = 89 81 = 90 82 = 91 83 = 92 84 = 93 85 = 94 86 = 95 87 = 96 88 = 97 89 = 98 90 = 99 91 = 100 92 = 101 93 = 102 94 = 103 95 = 104 96 = 105 97 = 106 98 = 107 99 = 108 100 = 109 101 = 110 102 = 111 103 = 112 104 = 113 105 = 114 106 = 115 107 = 116 108 = 117 109 = 118 110 = 119 111 = 120 112 = 121 113 = 122 114 = 123 115 = 124 116 = 125 117 = 126 118 = 127 119 = 128 120 = 129 121 = 130 122 = 131 123 = 132 124 = 133 125 = 134 126 = 135 127 = 136 128 = 137 129 = 138 130 = 139 131 = 140 132 = 141 133 = 142 134 = 143 135 = 144 136 = 145 137 = 146 138 = 147 139 = 148 140 = 149 141 = 150 142 = 151 143 = 152 144 = 153 145 = 154 146 = 155 147 = 156 148 = 157 149 = 158 150 = 159 151 = 160 152 = 161 153 = 162 154 = 163 155 = 164 156 = 165 157 = 166 158 = 167 159 = 168 160 = 169 161 = 170 162 = 171 163 = 172 164 = 173 165 = 174 166 = 175 167 = 176 168 = 177 169 = 178 170 = 179 171 = 180 172 = 181 173 = 182 174 = 183 175 = 184 176 = 185 177 = 186 178 = 187 179 = 188 180 = 189 181 = 190 182 = 191 183 = 192 184 = 193 185 = 194 186 = 195 187 = 196 188 = 197 189 = 198 190 = 199 191 = 200 192 = 201 193 = 202 194 = 203 195 = 204 196 = 205 197 = 206 198 = 207 199 = 208 200 = 209 201 = 210 202 = 211 203 = 212 204 = 213 205 = 214 206 = 215 207 = 216 208 = 217 209 = 218 210 = 219 211 = 220 212 = 221 213 = 222 214 = 223 215 = 224 216 = 225 217 = 226 218 = 227 219 = 228 220 = 229 221 = 230 222 = 231 223 = 232 224 = 233 225 = 234 226 = 235 227 = 236 228 = 237 229 = 238 230 = 239 231 = 240 232 = 241 233 = 242 234 = 243 235 = 244 236 = 245 237 = 246 238 = 247 239 = 248 240 = 249 241 = 250 242 = 251 243 = 252 244 = 253 245 = 254 246 = 255 247 = 256 248 = 257 249 = 258 250 = 259 251 = 260 252 = 261 253 = 262 254 = 263 255 = 264 256 = 265 257 = 266 258 = 267 259 = 268 260 = 269 261 = 270 262 = 271 263 = 272 264 = 273 265 = 274 266 = 275 267 = 276 268 = 277 269 = 278 270 = 279 271 = 280 272 = 281 273 = 282 274 = 283 275 = 284 276 = 285 277 = 286 278 = 287 279 = 288 280 = 289 281 = 290 282 = 291 283 = 292 284 = 293 285 = 294 286 = 295 287 = 296 288 = 297 289 = 298 290 = 299 291 = 300 292 = 301 293 = 302 294 = 303 295 = 304 296 = 305 297 = 306 298 = 307 299 = 308 300 = 309 301 = 310 302 = 311 303 = 312 304 = 313 305 = 314 306 = 315 307 = 316 308 = 317 309 = 318 310 = 319 311 = 320 312 = 321 313 = 322 314 = 323 315 = 324 316 = 325 317 = 326 318 = 327 319 = 328 320 = 329 321 = 330 322 = 331 323 = 332 324 = 333 325 = 334 326 = 335 327 = 336 328 = 337 329 = 338 330 = 339 331 = 340 332 = 341 333 = 342 334 = 343 335 = 344 336 = 345 337 = 346 338 = 347 339 = 348 340 = 349 341 = 350 342 = 351 343 = 352 344 = 353 345 = 354 346 = 355 347 = 356 348 = 357 349 = 358 350 = 359 351 = 360 352 = 361 353 = 362 354 = 363 355 = 364 356 = 365 357 = 366 358 = 367 359 = 368 360 = 369 361 = 370 362 = 371 363 = 372 364 = 373 365 = 374 366 = 375 367 = 376 368 = 377 369 = 378 370 = 379 371 = 380 372 = 381 373 = 382 374 = 383 375 = 384 376 = 385 377 = 386 378 = 387 379 = 388 380 = 389 381 = 390 382 = 391 383 = 392 384 = 393 385 = 394 386 = 395 387 = 396 388 = 397 389 = 398 390 = 399 391 = 400 392 = 401 393 = 402 394 = 403 395 = 404 396 = 405 397 = 406 398 = 407 399 = 408 400 = 409 401 = 410 402 = 411 403 = 412 404 = 413 405 = 414 406 = 415 407 = 416 408 = 417 409 = 418 410 = 419 411 = 420 412 = 421 413 = 422 414 = 423 415 = 424 416 = 425 417 = 426 418 = 427 419 = 428 420 = 429 421 = 430 422 = 431 423 = 432 424 = 433 425 = 434 426 = 435 427 = 436 428 = 437 429 = 438 430 = 439 431 = 440 432 = 441 433 = 442 434 = 443 435 = 444 436 = 445 437 = 446 438 = 447 439 = 448 440 = 449 441 = 450 442 = 451 443 = 452 444 = 453 445 = 454 446 = 455 447 = 456 448 = 457 449 = 458 450 = 459 451 = 460 452 = 461 453 = 462 454 = 463 455 = 464 456 = 465 457 = 466 458 = 467 459 = 468 460 = 469 461 = 470 462 = 471 463 = 472 464 = 473 465 = 474 466 = 475 467 = 476 468 = 477 469 = 478 470 = 479 471 = 480 472 = 481 473 = 482 474 = 483 475 = 484 476 = 485 477 = 486 478 = 487 479 = 488 480 = 489 481 = 490 482 = 491 483 = 492 484 = 493 485 = 494 486 = 495 487 = 496 488 = 497 489 = 498 490 = 499 491 = 500 492 = 501 493 = 502 494 = 503 495 = 504 496 = 505 497 = 506 498 = 507 499 = 508 500 = 509 501 = 510 502 = 511 503 = 512 504 = 513 505 = 514 506 = 515 507 = 516 508 = 517 509 = 518 510 = 519 511 = 520 512 = 521 513 = 522 514 = 523 515 = 524 516 = 525 517 = 526 518 = 527 519 = 528 520 = 529 521 = 530 522 = 531 523 = 532 524 = 533 525 = 534 526 = 535 527 = 536 528 = 537 529 = 538 530 = 539 531 = 540 532 = 541 533 = 542 534 = 543 535 = 544 536 = 545 537 = 546 538 = 547 539 = 548 540 = 549 541 = 550 542 = 551 543 = 552 544 = 553 545 = 554 546 = 555 547 = 556 548 = 557 549 = 558 550 = 559 551 = 560 552 = 561 553 = 562 554 = 563 555 = 564 556 = 565 557 = 566 558 = 567 559 = 568 560 = 569 561 = 570 562 = 571 563 = 572 564 = 573 565 = 574 566 = 575 567 = 576 568 = 577 569 = 578 570 = 579 571 = 580 572 = 581 573 = 582 574 = 583 575 = 584 576 = 585 577 = 586 578 = 587 579 = 588 580 = 589 581 = 590 582 = 591 583 = 592 584 = 593 585 = 594 586 = 595 587 = 596 588 = 597 589 = 598 590 = 599 591 = 600 592 = 601 593 = 602 594 = 603 595 = 604 596 = 605 597 = 606 598 = 607 599 = 608 600 = 609 601 = 610 602 = 611 603 = 612 604 = 613 605 = 614 606 = 615 607 = 616 608 = 617 609 = 618 610 = 619 611 = 620 612 = 621 613 = 622 614 = 623 615 = 624 616 = 625 617 = 626 618 = 627 619 = 628 620 = 629 621 = 630 622 = 631 623 = 632 624 = 633 625 = 634 626 = 635 627 = 636 628 = 637 629 = 638 630 = 639 631 = 640 632 = 641 633 = 642 634 = 643 635 = 644 636 = 645 637 = 646 638 = 647 639 = 648 640 = 649 641 = 650 642 = 651 643 = 652 644 = 653 645 = 654 646 = 655 647 = 656 648 = 657 649 = 658 650 = 659 651 = 660 652 = 661 653 = 662 654 = 663 655 = 664 656 = 665 657 = 666 658 = 667 659 = 668 660 = 669 661 = 670 662 = 671 663 = 672 664 = 673 665 = 674 666 = 675 667 = 676 668 = 677 669 = 678 670 = 679 671 = 680 672 = 681 673 = 682 674 = 683 675 = 684 676 = 685 677 = 686 678 = 687 679 = 688 680 = 689 681 = 690 682 = 691 683 = 692 684 = 693 685 = 694 686 = 695 687 = 696 688 = 697 689 = 698 690 = 699 691 = 700 692 = 701 693 = 702 694 = 703 695 = 704 696 = 705 697 = 706 698 = 707 699 = 708 700 = 709 701 = 710 702 = 711 703 = 712 704 = 713 705 = 714 706 = 715 707 = 716 708 = 717 709 = 718 710 = 719 711 = 720 712 = 721 713 = 722 714 = 723 715 = 724 716 = 725 717 = 726 718 = 727 719 = 728 720 = 729 721 = 730 722 = 731 723 = 732 724 = 733 725 = 734 726 = 735 727 = 736 728 = 737 729 = 738 730 = 739 731 = 740 732 = 741 733 = 742 734 = 743 735 = 744 736 = 745 737 = 746 738 = 747 739 = 748 740 = 749 741 = 750 742 = 751 743 = 752 744 = 753 745 = 754 746 = 755 747 = 756 748 = 757 749 = 758 750 = 759 751 = 760 752 = 761 753 = 762 754 = 763 755 = 764 756 = 765 757 = 766 758 = 767 759 = 768 760 = 769 761 = 770 762 = 771 763 = 772 764 = 773 765 = 774 766 = 775 767 = 776 768 = 777 769 = 778 770 = 779 771 = 780 772 = 781 773 = 782 774 = 783 775 = 784 776 = 785 777 = 786 778 = 787 779 = 788 780 = 789 781 = 790 782 = 791 783 = 792 784 = 793 785 = 794 786 = 795 787 = 796 788 = 797 789 = 798 790 = 799 791 = 800 792 = 801 793 = 802 794 = 803 795 = 804 796 = 805 797 = 806 798 = 807 799 = 808 800 = 809 801 = 810 802 = 811 803 = 812 804 = 813 805 = 814 806 = 815 807 = 816 808 = 817 809 = 818 810 = 819 811 = 820 812 = 821 813 = 822 814 = 823 815 = 824 816 = 825 817 = 826 818 = 827 819 = 828 820 = 829 821 = 830 822 = 831 823 = 832 824 = 833 825 = 834 826 = 835 827 = 836 828 = 837 829 = 838 830 = 839 831 = 840 832 = 841 833 = 842 834 = 843 835 = 844 836 = 845 837 = 846 838 = 847 839 = 848 840 = 849 841 = 850 842 = 851 843 = 852 844 = 853 845 = 854 846 = 855 847 = 856 848 = 857 849 = 858 850 = 859 851 = 860 852 = 861 853 = 862 854 = 863 855 = 864 856 = 865 857 = 866 858 = 867 859 = 868 860 = 869 861 = 870 862 = 871 863 = 872 864 = 873 865 = 874 866 = 875 867 = 876 868 = 877 869 = 878 870 = 879 871 = 880 872 = 881 873 = 882 874 = 883 875 = 884 876 = 885 877 = 886 878 = 887 879 = 888 880 = 889 881 = 890 882 = 891 883 = 892 884 = 893 885 = 894 886 = 895 887 = 896 888 = 897 889 = 898 890 = 899 891 = 900 892 = 901 893 = 902 894 = 903 895 = 904 896 = 905 897 = 906 898 = 907 899 = 908 900 = 909 901 = 910 902 = 911 903 = 912 904 = 913 905 = 914 906 = 915 907 = 916 908 = 917 909 = 918 910 = 919 911 = 920 912 = 921 913 = 922 914 = 923 915 = 924 916 = 925 917 = 926 918 = 927 919 = 928 920 = 929 921 = 930 922 = 931 923 = 932 924 = 933 925 = 934 926 = 935 927 = 936 928 = 937 929 = 938 930 = 939 931 = 940 932 = 941 933 = 942 934 = 943 935 = 944 936 = 945 937 = 946 938 = 947 939 = 948 940 = 949 941 = 950 942 = 951 943 = 952 944 = 953 945 = 954 946 = 955 947 = 956 948 = 957 949 = 958 950 = 959 951 = 960 952 = 961 953 = 962 954 = 963 955 = 964 956 = 965 957 = 966 958 = 967 959 = 968 960 = 969 961 = 970 962 = 971 963 = 972 964 = 973 965 = 974 966 = 975 967 = 976 968 = 977 969 = 978 970 = 979 971 = 980 972 = 981 973 = 982 974 = 983 975 = 984 976 = 985 977 = 986 978 = 987 979 = 988 980 = 989 981 = 990 982 = 991 983 = 992 984 = 993 985 = 994 986 = 995 987 = 996 988 = 997 989 = 998 990 = 999 991 = 1000

Table 2.2 Standard monitoring during the latent and active phases of labour and essential interventions

LATENT PHASE OF LABOUR		
Partogram parameters	Observations	Frequency of monitoring
Foetal well-being	Foetal heart rate	2 hourly
Progress of labour	Vaginal examination	4 hourly
	Uterine contractions	2 hourly
Maternal well-being	Blood pressure, pulse, temperature and urine testing	4 hourly
ACTIVE PHASE OF LABOUR		
Partogram parameters	Observations	Frequency of monitoring
Foetal well-being	Foetal heart rate	Half hourly
	Liquor colour and odour	2 hourly if membranes have ruptured
Progress of labour	Frequency and strength of uterine contractions	Hourly
	Descent of the presenting part	2 hourly
	Cervical dilatation	2 hourly
	Caput and moulding	2 hourly
Maternal well-being	Blood pressure and pulse	Hourly
	Temperature	4 hourly
	Urine testing	2 hourly
INTERVENTIONS		
Medication is given	Treatment and fluid administered	
Management plan	Problems identified and management	

2.2.1 Monitoring of the foetal well-being

The monitoring of the foetal condition during labour includes foetal heart rate, decelerations and variability. According to WHO (1994:7), protocol is recorded half

hourly in the first stage of labour and every 15 minutes in the second stage of labour. Other parameters are membrane status, liquor quality and amount.

2.2.1.1 Foetal heart rate

The foetal heart rate should be monitored and recorded four hourly during the latent phase of labour and half hourly, before and immediately after contractions during the active phase of labour ideally using a hand-held Doppler device (DoH, 2015:48). In the study by Lumadi (2014:87), out of the 24 partograms that were audited, it was revealed that the recording of the foetal heart rate was done on a very significant percentage of 33.3%. The unrecorded to the standard were also a very high percentage of 58.3%, and those that were altogether not recorded were on 8.3% partograms (Lumadi, 2014:87). This is a clear indication that foetal heart rate monitoring is not done according to set standards even though the study was conducted on a small sample. The study was conducted at three health facilities and results could not be generalised to the entire province or country.

According to Mdoe (2012:23), 67.7% of the foetal heart rate was recorded as substandard while 32.3% was recorded according to the standard and 0% was not recorded. This is contrary to the findings by Yisma, Dessalegn, Astatkie and Fesseha (2013, 10:23), where it was revealed that based upon a review of 420 of the modified WHO partograms across all the health units, the foetal heart rate was not recorded in 174 (41.1%). The records were judged to be substandard in 117 (27.9%) while they were recorded up to the recommended standard in 129 (30.7%) of the partograms reviewed. This was similar to the study by Mulondo, Khoza and Risenga, (2013: 5) where only 6.3% of the foetal heart rate was not recorded. According to Adesola, Omolola, Adekemi and Audu (2014:682), the foetal heart rate was incorrectly or not charted in over 50% of the case files. In the study by Moalusi (2011:19) on clinical outcomes and practices in the maternity unit of a district hospital, it was revealed that aspects that were especially poorly completed included the monitoring of foetal decelerations (94.5% not completed) and the foetal heart rate not completed or recorded was 33.9%, however findings of this study may not represent all hospitals in North-West Province of South Africa as it was conducted at one hospital only. This is also consistent with the study by Jere (2014:23) where it was revealed that the foetal heart rate was the least wholly documented with 12.3%

(20/162) compared to moulding 34.6% (56/162) and liquor 37% (60/162), making it impossible to diagnose foetal distress. Findings cannot be generalised as the study was conducted at one hospital only.

2.2.1.2 Liquor

The state of liquor or amniotic membranes is vital in assessing foetal status and assessing the foetal condition. The appearance or worsening meconium staining, scanty or absent liquor during artificial rupture may indicate foetal hypoxia and the need to expedite delivery. The state of the amniotic fluid should be recorded whether the membranes are intact, clear or meconium stained (Nolte, 2008:21).

According to Adesola *et al.* (2014:682), liquor was incorrectly or not charted in over 50% of the case files where 127(41.8%) of charts had state of liquor recorded while 177 (58.2%) were not recorded. This was consistent to the study by Yisma *et al.* (2013, 10:23) where it was revealed that the status of membranes was recorded only in 113 (26.9%) of the partograms reviewed and 307 (73.1%) were not recorded at all. This was also confirmed by Lumadi (2014: 83) where a significant percentage (66.6%) of the amniotic fluid and rupture of membranes was recorded. According to the expected standard, 29.1% was not done according to standard, and 4.2% revealed that membranes were not observed or not recorded.

2.2.2 Monitoring of progress of labour

The central part of the partogram that also needs to be monitored according to the standard is the progress of labour. The recording is done at the rate of cervical dilatation, effacement, length, the descent of the presenting part, pattern and strength of uterine contractions. On the left side of the partogram is the number from zero to ten, the vertical site of each square represents one centimetre (cm) per hour, in the horizontal line each square represents half hour and dilatation of the cervix is measured in centimetres, and a symbol of X is plotted on the graph. There are two diagonal lines in the section of the partogram, the alert line and action line. The alert line represents the rate of cervical dilatation at 1cm per hour, which is considered the lowest level of cervical dilatation per hour in average labour for both nulliparous and multiparous. When labour is progressing well, the rate of cervical dilatation should remain on the left of the alert line. When the rate of cervical dilatation is to the right of

the alert line, it indicates the slow progress of labour (Sarsam, Flayeh & Alnakkash, 2014:435).

In the study conducted by Bazirete (2014:56), it was revealed that a significant percentage of midwives in the selected health facilities have a fair knowledge of the partogram and the necessity of its utilisation in the management of labour. However, despite the fair knowledge of nurses and midwives, a large percentage of participants were reported to complete the partogram poorly. Data collection was done with the aid of a self-administered questionnaire, which might have led to bias; the checklist would have been a suitable way of data collection. A small sample size of 131 participants from 15 institutions is insufficient. According to Opoku and Nguah (2015:6), it is evident that birth attendants need more education on the importance and correct usage of the partogram to ensure that all labours are monitored with the partogram as the study revealed that almost half of labour cases were not monitored with the partogram. The study did not show the extent of use of the partogram for monitoring the progress of labour in the health facilities and a small sample was used, thus affecting generalisability. In the study conducted by Singh (2013:105), it was revealed that most aspects of the progress of labour section on the partogram were recorded correctly. That was a transfer of information (79.7%), dilatation of the cervix (89%), effacement (50%), contractions (80.3%) and descent of the foetal head (86.1%). This indicated that recording of those observations was at a good standard. This was in contrast with findings in many studies that reported sub-optimal recordings of those parameters, except for cervical dilatation.

2.2.2.1 Cervical dilatation, effacement and length

Features that are indicative of the progress of labour are dilatation and effacement of the cervix (Fraser, Cooper & Nolte, 2010:468). In the study conducted by Lumadi (2014:88) out of 24 partograms that were audited, recording of cervical dilatation according to the set standards was found to be on 70.8% partograms. The ones not recorded according to the standard were 29.2% partograms. Although a small sample size was used, it is evident that cervical dilatation and effacement are perceived as essential to be done and recorded when monitoring a woman in labour. This is in contrast to the study conducted by Asibong, Okokon, Agan, Oku, Opia, Essie and Monjok (2014:876) where it was revealed that midwives of about 86 (66%)

did not know the location of the action line. Ninety-six (73.8%) had no idea of the typical labour graph or plotting on a partogram, using the alert and action lines as yardsticks. The researchers used a self-administered questionnaire that might have led to bias because the participants might have given answers that were required by the researcher. Purposive sampling was also not relevant in this study, as this might have affected generalisability. This study is similar to the one conducted by Okokon, Oku, Agan, Asibong, Essie and Monjok (2014:4) on the evaluation of knowledge and utilisation of partogram in primary, secondary and tertiary care. The study revealed that 49% of participants did not know that the graph should fall on the left of the alert line when plotting the cervical dilatation. The study could not be generalised as private hospitals were excluded. Self-administered questionnaire results might have led to bias because the participants might have given answers that were desirable to the researcher. The purposive sampling also was not relevant in this study as this might have affected generalisability. This is also consistent with the study by Konlan, Kombat, Wuffele and Aarah-Bapuah (2016: 3) where it revealed that most could not identify the specific time to commence recording on the partogram and did not know the symbol of an X to be used for cervical dilatation according to the World Health Organisation. The study would have yielded better results if a more extensive sample had been used and if partograms had also been reviewed.

Yisma, Dessalegn, Astatkie and Fesseha (2013,10:23) conducted a study on the completion of modified WHO partogram during labour in a public institution; the study revealed that 41.0% was of unrecorded cervical dilatation, 26.2% for substandard and 32.95% for being recorded to the standard. The action line of the cervical graph was crossed only in 15(10.9%) of the recorded partograms. The findings did not show the extent of partogram utilisation for monitoring progress of labour. This was similar to the study by Mdoe (2012:21) on the quality of partogram recordings and perinatal outcomes where it revealed a poor recording of cervical dilatation at 44.2%. The study was conducted with a small sample and at one hospital implying that results could not be generalised. Results of the study by Adesola, Omolola, Adekemi and Audu (2014:682) on partogram utilisation at three health care delivery services revealed that out of 304 files assessed, 50% showed that variables indicating the progress of labour–cervical dilatation were correctly charted. This is in contrast with what other studies revealed. However, a small sample size of the obstetric staff

limited the generalisation of the findings from this study. In the study by Shokane (2011:37), it was revealed that midwives experienced challenges on the utilisation of the partogram. Midwives could not monitor the progress of labour four hourly in the latent phase of labour and two hourly in the active phase of labour. The study was not specific as to the parameters that were not adequately recorded.

2.2.2.2 Descent of presenting part

The descent of the head is performed with the abdominal examination immediately before the vaginal examination. The head position is recorded on the composite partogram with "O" (Sarsam *et al.*, 2014:435). During normal labour, the head descends progressively. The study conducted by Adesola *et al.* (2014:682) on partogram utilisation at three health care delivery services revealed that out of 304 files assessed, 50% showed that variable descent of the head in over 50% of the files was not recorded. Generalisation of this study is limited because of a small sample size. This is also consistent with the study conducted by Konlan *et al.* (2016:4) that revealed an inadequate knowledge of how to plot information on the partogram, particularly the symbols used. The study showed ineffective usage of the partogram by midwives within the metropolis. However, the study was conducted at three hospitals with only 140 midwives and using a questionnaire. It would have yielded better results if a more extensive sample was used and if partograms were also reviewed. Similarly, Yisma *et al.* (2013:23) confirms that 84.05% of descent of the presenting part was not recorded and the substandard was 9.0%.

According to Mdoe (2012:21), 89% of the descent of the presenting part was not recorded. The study was conducted with a small sample and at one hospital implying that results could not be generalised. Findings were similar to the study by Yisma *et al.* (2013:17) which revealed that there was inadequate utilisation in plotting partogram parameters. The data collection checklist did not indicate the partograms parameters that were assessed as well as parameters of the progress of labour that was said to be of substandard care. Findings were confirmed by Moalusi (2011:19) where it was revealed that monitoring descends of the foetal head (74.6%) were not completed. However, findings of this study may not represent all hospitals in the North-West province of South Africa as it was conducted at one hospital. This was also consistent with the study by Podder and Tayade (2016:66), where it was

revealed that descent of the presenting part was entirely not recorded in 49 (49%) of the partograms reviewed. These were recorded to standard in 31 (31%) and were substandard in 20 (20%). Findings of the study cannot be generalised as the study was conducted at one hospital.

2.2.2.3 Moulding and Caput

Moulding is an important indicator of how well the pelvis can accommodate the foetal head. Moulding is a diagnostic criterion for cephalopelvic disproportion especially if the head is high. Excessive moulding is one of the diagnostic criteria of obstructed labour (Quereshi, Sekadde-Kigundu & Mutiso, 2010:240). Quereshi *et al.* (ibid) also revealed that documentation about moulding was weak in all facilities. In this study, facilities were randomly selected including the private hospital, and convenient sampling was used for rapid assessment. Simple random sampling could have been used for the generalisation of findings. According to Adesola *et al.* (2014:682), moulding and caput were incorrectly or not charted in over 69.7% of the case files. This was contrary to the study by Mulondo *et al.* (2013: 5) where only 9.5% recorded moulding and caput incompletely. According to Fawole, Shah, Fabanwo, Adegbola, Adewunmi, Eniayewun, Dara, El-Ladan, Umezulike, Alu, Adebayo, Obaitan, Onala, Usman, Sullayman, Kailani and Sa'id (2010: 203), on the utilisation of the partogram in primary health care facilities, the low utilisation of partograms and substandard plotting of all partogram parameters was evident. The study revealed imperfect knowledge on the use of the partogram and this is similar to previous findings. Lumadi (2014:88) also confirmed this, where moulding on the head of the foetus was recorded according to standard on 18 (75.0%) partograms and not recorded according to standard on a significant percentage of 20.8% partograms. The study revealed that 4.2% moulding was not checked or not recorded. The study was conducted using a small sample size. Similarly, Yisma *et al.* (2013:23) confirmed that moulding of foetal head was not recorded at all in 26 (6.2%) and 30 (7.1%), it was plotted below the standard and up to the recommended standard respectively.

2.2.2.4 Strength of uterine contractions.

In typical labour, the contractions become more frequent and last longer as labour progresses. Numbers of contractions in ten-minute period describe the frequency of contractions. The duration of contraction is from the first time felt abdominally to the

time when the contraction has passed off and is measured in seconds. Observations of the contractions are made every 30 minutes on the partogram (Sarsam *et al.*, 2014:435). Similarly, Lumadi (2014:89) confirms that 33.3% observations of contractions were recorded according to set standards and 66.7% partograms, observations of contractions were not recorded. This is also a revelation that some parameters are not considered necessary as this in this study the highest percentage of 66.7% (n=16) of contractions were not recorded according to standard. Findings were similar to the study by Yisma *et al.* (2013:10:23) where uterine contractions were not recorded in 189 (45.0%) while the ones recorded to the standard were 87(20.7%) and sub-optimally recorded in 144 (34.3%) of the partograms. This was consistent with the study by Mdoe (2012:21) where only 81.4% of uterine contractions plotted were substandard, and 4.0% were not recorded at all.

In the study by Mulondo *et al.* (2013:5), 95.8% of midwives were found to be incompetent in monitoring the strength of uterine contractions. However, data collection was done with the aid of a self-administered questionnaire, which might have led to bias; a checklist would have been a suitable way of data collection. In the study conducted by Fawole *et al.* (2010:203) on utilisation of the partogram in primary health care facilities, it was confirmed that the utilisation of the partogram was very low and there was poor plotting of all partogram parameters. The study generalised the results to all maternity care providers, but the sample size was not equal in all categories. The study conducted by Adesola *et al.* (2014:682) on partogram utilisation at three health care delivery services revealed that out of 304 files assessed 50% showed that uterine contractions were not recorded. Results could not be generalised because of a small sample size.

According to Salama, Abd Allah and Heeba (2010: 170), it was revealed that recording of uterine contraction and time of delivery were neglected in the majority of reviewed sheets (71.4%, 96.8% respectively). The study sample was a convenience sample of 103; a small size from eight health facilities. Random sampling should have been used to generalise findings. This was similar to the study conducted by Podder and Tayade (2016:66) where uterine contraction was not at all recorded in 10 (10 %) while it was recorded to the standard in 71 (71%) and sub-optimally

recorded in 19 (19%) of the partograms studied. Findings of this study cannot be generalised as it was confined to one hospital only. Asibong et al. (2014:876) also confirmed this in the study where midwives had no knowledge of the duration of the minimum contractions in ten minutes and the minimum time required to assess uterine contractions during normal labour.

2.2.3 Maternal well-being

The third component records maternal temperature, pulse rate, maternal blood pressure, and regular urinalysis and the management plan. The assessment through the partogram helps on clinical decision making regarding the mode of delivery, either by caesarean section, if there is a clinical indication such as foetal distress or obstructed labour or others or by vaginal delivery (Sarsam *et al.*, 2014:435). The monitoring of maternal vital signs: temperature, pulse blood pressure, and urinalysis would enable midwives to identify problems such as pre-eclampsia, haemorrhage, anaemia, infections and they would thus be able to act upon them early and reduce maternal and perinatal morbidity and mortality.

2.2.3.1 Temperature

The maternal temperature should be monitored, recorded and should remain within normal limits as an elevated temperature is indicative of infection or ketosis (Fraser, Cooper & Nolte, 2010:467). According to Adesola *et al.* (2014:684), 46.1% was not recorded in the study conducted on partogram utilisation. The monitoring of maternal vital signs, temperature, among others would enable midwives to identify problems such as infections. They would be thus able to act upon them early thus reducing maternal and perinatal morbidity and mortality (Sarsam *et al.*, 2014:435). This was inconsistent with the study conducted by Singh (2013:77) where the temperature was recorded correctly at 66.1%, 10% of charts were recorded incorrectly, and 23.9% were not recorded from a total of n=310. The findings of the study cannot be generalised because the research was conducted in a hospital only excluding community health centres and clinics. Purposive selection of the public hospitals may have some bias as the selected hospitals were district and regional hospitals only, and midwives working in the primary health care setting were left out. In the study undertaken by Mathibe-Neke, Lebeko and Motupa (2013:150), it was revealed that

out of a sample of 62, only 14 recorded vital signs on the partogram. The study was conducted at one hospital affecting the generalisability of the findings.

2.2.3.2 Pulse Rate and Blood Pressure

The maternal pulse should also be monitored and recorded as an elevated pulse of more than 100 beats per minute may be indicative of anxiety, pain, infection, ketosis and haemorrhage (Fraser *et al.*, 2010:467). Blood pressure should also be monitored and recorded as elevated blood pressure is indicative of pre-eclampsia or essential hypertension and may further be elevated by labour. According to Lumadi (2014:85), in the 54.2% (n = 13) of the partograms that were audited, the recording of the pulse was done according to standard at 41.6% (n = 10). Those not recorded accordingly were 4.2% (n = 1) of the partograms. This was consistent with Quereshi *et al.* (2010:239) where the maternal pulse and blood pressure were not recorded at all in some facilities, and the parameters were not always documented according to accepted frequency. Moalusi (2011:19) also confirmed this in the study where there was no recording of 40.3% and 51.5% of blood pressure and pulse respectively. Similarly, Adesola *et al.*, (2014:684) revealed that there was no recording of 47.4% and 46.1% of pulse and blood pressure respectively. Lumadi (2014:84) also confirms that the recording of blood pressure recorded according to standard was on 17 (70.8%) of the partograms; not recorded were 6(25.0%) of the partograms; and on 1(4.2%), the blood pressure was not checked or recorded. However, the study was conducted on a small sample and at three hospitals only, therefore cannot be generalised.

In the study conducted by Shokane (2011:30), it was revealed that some participants were unable to plot the maternal status of the woman in labour, correctly. As such, they were providing substandard midwifery care about the maternal status because they were not competent to diagnose problems related to the recording of vital signs and urine output such as decreased urinary output and presence of ketones in urine which denotes maternal exhaustion. The findings of the study cannot be generalised because the research was conducted in only two hospitals and the study only indicated that interviews were conducted until data were saturated, not indicating at what level was data-saturated and thus resulting in possible researcher bias. This is consistent with the study by Mulondo (2013: 8)

where it was revealed that 56% of the midwives perceived themselves to be incompetent in taking and recording blood pressure correctly. This could be a cause for concern in this study as it might further contribute to low Apgar scores among neonates.

A study was also conducted by Yisma *et al.* (2013:23) and revealed that 217 (51.7%) deliveries during the period of study had their blood pressure monitored. Seventy-eight (18.6%) were monitored to standard while 139 (33.1%) were substandard. This was similar to Gans-Lartey, O'Brien, Owaregyekye and Dschopfloche (2013: 461), where it was reported that the mother's pulse rate showed the lowest compliance rate (25.5%) compared to the FHR that showed a high compliance rate (82.6%). This was despite the same monitoring interval (every 30 minutes). In this study, it is clear that midwives might not perceive the need for such frequent measurement of the mother's heart rate.

2.2.3.3 Urinalysis

Urine should be tested during labour for glucose, ketones and proteins (DoH, 2016:41). According to Fraser *et al.* (2010:467), ketones or acetone may occur because of starvation or maternal distress when all available energy has been utilised. A trace of protein may be a sign of infection and a more significant protein in urine may indicate pre-eclampsia. The presence of glucose in urine is a sign of diabetes mellitus while a full bladder delays engagement of the presenting part and causes prolonged labour.

According to Lumadi (2014:86) of the 24 partograms that were audited, urine results were recorded according to standard (33.3%); the ones not recorded according to standard were 25.0%, and a significant percentage were not checked or recorded (41.7%). This also confirmed non-utilisation and selection of partogram parameters over others. Although the study was conducted at three hospitals only and using a small sample, it is clear that there was no compliance during labour monitoring by midwives. Adesola *et al.* (2014:684) confirmed this where it was revealed that the parameters of urinalysis not recorded were protein 77 % and acetone 85.9%.

In a study conducted by Shokane (2011:30) it was discovered that some participants were incompetent to diagnose problems related to the recording of vital signs and

urine output such as decreased urinary output and presence of ketones in urine which denotes maternal exhaustion. According to Sarsam *et al.* (2014:435) the monitoring of maternal vital signs, urinalysis, would enable midwives to identify problems such as pre-eclampsia, haemorrhage, anaemia, infections and they would be thus able to act upon them early thus reducing maternal and perinatal morbidity and mortality. This was consistent with the study by Singh (2013:78) where 41.3% of urinalysis was recorded, 19% incorrectly recorded and 39.7% not recorded at all. This is a clear indication that vital signs were not perceived as vital by midwives when monitoring women in labour.

2.2.3.4 Medication given

An accurate record of treatment given during all phases of labour should be kept as well as that of fluids administered by whatever route (DoH, 2015:48). In the study by Lumadi (2014:84), it was revealed that a high percentage of 19 (79.2%) on medication given was recorded according to standard, 12.5% were not recorded according to standard and on 2 (8.3%) the medication was not given or not recorded. This was a clear sign that some midwives and other healthcare workers were aware that the recording of medication given should be recorded whereas others did not record at all. The findings cannot be generalised because of a small sample size and being conducted at three hospitals only.

2.2.3.6 Management Plan

Midwives and other healthcare professionals involved in the care of a woman in labour should record the problems identified during monitoring in labour and record the plan of action to be taken in the subsequent management and to record interventions that were implemented if any. In the study by Lumadi (2014: 83), 58.3% (n = 14) of the partograms management plan were indicated according to standard on 4% (n = 1) and a very high percentage of 37.5% (n = 9) was not recorded according to standard. This is similar to the study conducted by Moalusi (2011:22) where 19.0% of partograms had a recorded management plan, 27.1% were not recorded correctly, and 53.9% were not recorded at all. The results might not represent all hospitals in South Africa as the study was conducted in one hospital with a narrow sample size.

2.3. RECORDINGS OF MATERNAL OUTCOMES

Prolonged labour and obstructed labour are the primary causes of maternal morbidity and mortality. They can lead to the following adverse outcomes: ruptured uterus, postpartum haemorrhage, puerperal infection, obstetric fistula, urinary and faecal incontinence, pain and foetal injury or death (Fistula Care and Maternal Health Task Force, 2012:1). Perineal and cervical tears were also identified as other maternal adverse outcomes. According to Fistula Care and Maternal Health Task Force (2012:1), if the partogram is utilised competently, it can save lives by ensuring that labour is carefully monitored and life-threatening complications such as obstructed labour are identified and treated. In the study conducted by Jere (2014:27) women who were monitored during labour (37.5%) (24/64) delivered by caesarean section and 4.7% (3/64) delivered by assisted vacuum extraction. This could have been avoided if partogram was interpreted.

2.3.1 Prolonged labour

Labour is said to be prolonged when it exceeds the number of hours considered standard on a nulliparous or multiparous woman according to Fraser *et al.* (2010: 560). Prolonged labour can occur in the first and second stages of labour (Dippenaar & da Serra, 2012:425). In the study conducted by Tayade and Jadhao (2012:259) the incidence of prolonged labour with the use of a partogram was significantly reduced with none of the women having labour beyond 12 hours out of a sample of 100. The study also revealed that a significant percentage of 11% of these women in whom partogram was not used was in labour for longer than accepted hours of up to 16 hours and 6% of women had an intrapartum period of more than 16 hours confirming that progressing labour without the use of partogram should be avoided. However, results could not be generalised as the study was conducted at one hospital. Sarsam, Flayeh and Alnakkash (2014:437) conducted a randomised prospective comparative study where it was significantly found that prolonged labour was higher in composite partogram compared to the simplified one. The study compared an unequal number of both partograms where bias might have occurred. The study was confined to one teaching hospital where results could not be generalised. This was consistent with the study by Maina, Mutungwa-Mwenda and Karonjo (2016:79) where it was revealed that diagnosis of prolonged labour could be made on the partogram as well as the unsatisfactory progress of labour and

inefficient uterine contractions. However, findings of this study could not be generalised as it was conducted at one hospital over a period of two years with a small sample for that period.

In the study conducted by Weerasekara (2014:29) on the usefulness of a partogram to improve outcome, it was revealed that the introduction of the partogram and agreed management protocol, reduced prolonged labour from 6.4% to 3.4%. However, the study is not consistent with other studies as evidence of these two trials depicts that it cannot be recommended that maintaining the partogram is mandatory in labour. In the study conducted by Kushwah, Singh and Singh (2013:4374.) it was revealed that the use of the partogram helped in an overall reduction in the duration of labour. The timely intervention reduced the incidence of prolonged labour and its sequelae. Nineteen point two per cent (19.2%) of the women showed abnormal labour.

2.3.2 Obstructed labour

It occurs when despite good uterine contractions, there is no advance of the presenting (Fraser *et al.*, 2010:564). According to Magon (2011: 2), prevention of obstructed labour is a crucial intervention towards reducing maternal and perinatal mortality and morbidity and in achieving SDG 3. A study was conducted by Kip (2013:53), and findings revealed that maternal mortality due to obstructed labour was found to be 1.4% and no woman should die while giving birth. The study also revealed that perinatal mortality due to obstructed labour was a significant percentage of 5%. The study was conducted at one hospital, with a small sample and making it impossible to generalise results. Similarly, Maina *et al.*, (2016:79) confirmed that partogram could be used to diagnose obstructed labour. This is consistent with the study by Ubaid, Shukar-ud-din, Nigar and Soomro (2013:42) which revealed that no case of obstructed labour was reported in their study where partogram was utilised. The study was conducted at one hospital, affecting generalisability.

2.3.3 Post-partum haemorrhage (PPH)

It is categorised into primary post-partum and secondary post-partum haemorrhage

(DoH, 2014:2). Primary PPH is excessive blood loss from the genital tract during the first 24 hours after delivery. It is described according to the severity as mild PPH with blood loss of ≥ 500 mls, severe PPH -- blood loss ≥ 1000 mls and massive blood loss -- blood loss ≥ 2500 mls. According to the DoH (2014:2), secondary PPH is excessive blood loss following delivery after 24 hours and up to 6 weeks following delivery. In the study conducted by Jere (2014:4), it was revealed that when obstructed labour is not timely recognised and managed, it can lead to maternal mortality or morbidity such as the ruptured uterus, postpartum haemorrhage, infection and obstetric fistula. The study also revealed that postpartum haemorrhage (PPH) occurred in 6.3% (4/64) of women, and all the women that had PPH had delivered by caesarean section or vacuum extraction.

According to Sarsam *et al.* (2014:435), postpartum haemorrhage occurred in 18 cases (5.3%) of those women monitored with composite partogram. This is consistent with the study by Mdoe (2012:26) where 11 women out of 22 suffered PPH that was related to substandard monitoring and recording of a partogram. This was also confirmed in the study by Kitila, Gmariam, Molla and Nemera (2014:3) where, of the reviewed documents of 313 (92.1%), 12 (3.8%) developed PPH and 15 (4.8%) had blood transfused. Based on the findings of the study it was concluded that the utilisation of the partogram during labour, documentation of the critical events of labour and poor birth outcomes are closely associated. In this study, not all 340-delivery records were reviewed, and the results cannot be generalised as the study was conducted in one hospital only. Sarsam *et al.* (2014: 437) also confirmed this where it had been significantly found that postpartum haemorrhage was higher in the composite partogram compared to the simplified one. The study compared an unequal number of two different partograms where bias might have occurred. The study was confined to one teaching hospital where results could not be generalised. This was similar to the study conducted by Ubaid *et al.* (2013:42) which revealed that no case of PPH was reported in their study where the partogram was utilised. However, the study was conducted at one hospital affecting generalisability. This was contrary to Kip (2013:64) where it was identified that out of the partograms that were entirely unutilised, 77 cases (79.4%) did not have labour related complications, and a meagre percentage of 1% had PPH.

2.3.4 Ruptured uterus

It involves a tear in the wall of the uterus with or without the expulsion of the foetus, often fatal for the foetus and responsible for maternal death (Fraser *et al.*, 2010:632). It is also a situation where the laceration is in direct contact with the peritoneal cavity, and all layers of the uterus are involved; the peritoneum, myometrium and the endometrium (Dippenaar & da Serra, 2012:434).

A retrospective study was conducted by Kabkyenga, Ostergren, Turakira, Mukasa and Petterson (2011: 55). This study investigated the role of individual and health facility factors and the risk for obstructed labour and its adverse outcomes in south-western Uganda. Obstetric records were reviewed in six hospitals. Maternal complications observed among women with obstructed labour were ruptured uterus (7.1%), puerperal sepsis (3.4%), bladder injury (1.8%), postpartum haemorrhage (1.2%), fistulae (1.4%) and one case of disseminated intravascular coagulation. This was associated with the recording of a partogram. In this study, results can be generalised though reviewing of records alone was not sufficient, interviewing could have also yielded richer data. In this study. The sample size was unequal in all institutions, implying that there could have been bias on the researcher's side. This was similar to the study conducted by Ubaid *et al.* (2013:42) which revealed that no case of the ruptured uterus was reported in their study where the partogram was utilised. However, the study was conducted at one hospital where results could not be generalised. In the study by Kip (2013:64), it was revealed that if the partogram was entirely unutilised, 77 cases (79.4%) had no complications and a low percentage of 1% had a ruptured uterus.

2.3.5 Puerperal sepsis or Infections

It is an infection of the genital tract following childbirth (Fraser *et al.*, 2010: 1054). Puerperal sepsis or infections are the primary cause of maternal death if it is undetected and or untreated. According to Kabkyenga *et al.* (2011:55), maternal complications observed among women with obstructed labour were ruptured uterus (7.1%), puerperal sepsis (3.4%) and this was found to be related to partogram utilisation. In this study, results can be generalised though reviewing of records alone was not sufficient, interviewing also could have yielded rich data. This was consistent with the study conducted by Ubaid *et al.* (2013:42) which revealed that only two cases of puerperal pyrexia with sepsis were reported. This was similar to the study

conducted Jere (2014:4), where it was revealed that when obstructed labour is not timely recognised and managed, it can lead to maternal mortality or morbidity such as infection. In the study conducted by Kip (2013:64), it was identified that where the partogram was entirely unutilised, 13 (13.4%) had sepsis. Tayade and Jadhao (2012:258) when comparing outcomes of patients monitored with and without a partogram confirmed this. It was revealed that a significant reduction in puerperal sepsis was observed in cases where partogram was used, at 1% as compared to 6% where partogram was not used.

2.3.6 Obstetric fistula

It is a hole between the birth canal and bladder or rectum which is caused by prolonged, obstructed labour and without access to timely, high-quality medical treatment. It is a medical condition in which a fistula (hole) develops between the rectum and vagina (rectovaginal fistula) or between the bladder and vagina (vesicovaginal fistula) after prolonged obstructed childbirth when adequate medical care has not been available (UNPFA-United Nations Population Fund, 2014:22). It leaves women leaking urine, faeces or both. In the study conducted by Kabkyenga *et al.* (2011:55), only 1.4% fistulae developed and this was associated with the recording of a partogram where prolonged labour was not detected. In this study, the sample size was unequal in all institutions implying that there could have been bias on the researcher's side and results cannot be generalised. It was also confirmed in the study conducted by Jere (2014:4), that when obstructed labour is not timely recognised and managed, it can lead to maternal mortality or morbidity such as obstetric fistula.

2.3.7 Perineal Tears

The perineal tear is when the skin and muscles in the perineum (the area between the vagina and anus) are injured during birth. Perineal tears are classified as 1st, 2nd, 3rd and 4th-degree tears. The 1st-degree tear involves the fourchette only while the 2nd-degree tear involves the fourchette and the superficial perineal muscles. The 3rd-degree tear comprises a partial or complete disruption of the anal sphincter muscle, and the 4th-degree tear involves the disruption of the anal sphincter muscle with a breach of the rectal mucosa (Fraser *et al.*, 2010:519). Tears can also affect the cervix, labia and clitoris. Mdoe (2012:20) conducted a study on the quality of

partogram recordings, and perinatal outcomes and findings of the study indicated adverse maternal outcomes: five had perineal tears, one got a perineal hematoma, two had urinary bladder injury, and one had bowel injury. The study was conducted with a small sample and at one hospital implying that results could not be generalised.

2.3.8 Maternal Mortality

Maternal mortality is death as a result of pregnancy or childbirth and includes the first six weeks of the puerperium that is usually expressed per 100 000 childbirths (Fraser *et al.*, 2010:1028). It is further defined as the death of a woman while pregnant or within 42 days after delivery or after termination of the pregnancy. Also irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (DoH, 2015:13).

Maternal deaths may be divided into:

- Direct obstetric deaths - resulting from obstetric complications of pregnancy, labour or the puerperium, from interventions, omissions, incorrect treatment or from a chain of events resulting from any of these.
- Indirect obstetric deaths - resulting from a previously existing disease that was aggravated by the physiological effects of pregnancy (DoH, 2015:13).

Kip (2013: 75) conducted a study on the prevalence of obstructed labour among pregnant women. The findings of the study revealed that maternal mortality due to obstructed labour amounted to 1.4% and this could have been prevented by the proper antenatal care and careful, attentive monitoring during delivery with the proper use of the partogram. If the partogram is used accordingly to monitor the woman during labour, the occurrence of complications will be identified in good time with success, and lifesaving interventions will be implemented before further complications. The study further revealed that 14 (9.8%) had severe consequences such as sepsis and ruptured uterus resulting in maternal death. The findings might not be representative and cannot be generalised to the general population because of the small sample size as it was conducted at one clinical facility. In the study conducted by Fawole, Shah, Fabanwo, Adegbola, Adewunmi, Eniayewun, Dara, El-Ladan, Umezulike, Alu, Adebayo, Obaitan, Onala, Usman, Sullayman, Kailani and

Sa'id (2012:38), maternal mortality ratio was higher than the value of 545 maternal deaths per 100 000. The study further revealed that low levels of maternal education, lack of antenatal care, poor quality intra-partum care (partogram use) and deficiencies in the health care system are the major predisposing factors to maternal mortality. The study was not specific on how many maternal deaths were reported or identified because of partogram use or non-use. This is similar to the study conducted by Asibong *et al.* (2014:875) that revealed that there were 14 maternal deaths recorded, giving a maternal mortality ratio of 590 deaths per 100,000 live births. The direct causes of maternal deaths were eclampsia and prolonged obstructed labour. The purposive sampling was not relevant in this study as this might affect generalisability.

The study conducted by Jere (2014: 27) is in contrast with other studies wherein almost 40.6% (26/64) of women who crossed the action line suffered immediate adverse outcome with no significant difference in maternal outcomes (postpartum haemorrhage, ruptured uterus and maternal deaths). The study was conducted in only one district hospital; the findings could not be generalized to all hospitals. In the study conducted by Kushwah *et al.* (2013:4374.) it was shown that the use of partogram helped in an overall reduction in the duration of labour. The timely intervention reduced the incidence of prolonged labour and its sequelae. 19.2% of the women showed abnormal labour. Severe complications were successfully averted, and there were no cases of maternal death, puerperal sepsis, ruptured uterus or fresh stillbirths. The setting and sample size of this review was not indicated making it difficult to generalize findings to the whole of Sub-Saharan Africa and South Asia. In the study by Jere (2014:27), there was no significant difference in maternal outcomes, especially maternal deaths. This was consistent with the study by Moalusi (2011: 21) where there was no maternal mortality related to the use of partogram. In the study by Adesola *et al.* (2014:689), it was shown that non-utilization and inappropriate utilization of the partogram in maternity units to monitor the progress of labour have implications for increased maternal morbidity and mortality. The study did not indicate the number of maternal deaths in their results but acknowledged that adverse outcomes were there. The sample size was small implying that results could not be generalised.

2.4 RECORDING OF NEONATAL OUTCOMES

Prolonged labour and obstructed labour are the primary causes of new-born morbidity and mortality leading to the following adverse outcomes: low Apgar score, early neonatal mortality, fresh stillbirths, hyperbilirubinaemia, meconium aspiration, sepsis, birth asphyxia, transient tachypnea of a new-born, respiratory distress syndrome and hypoxic-ischaemic encephalopathy (neonatal encephalopathy).

2.4.1 Low Apgar score

The Apgar score is a clinical score devised by Virginia Apgar to determine the baby's ability to initiate and maintain breathing after birth (Harrison, 2012:177). The Apgar score consists of five physical signs each scoring 0, 1 and 2 points and the total score indicates the clinical condition of the infant and the need for resuscitation. The Apgar score where there is no need for resuscitation is a score of from 7 to 10, and anything below 7 is a low Apgar score (Harrison, 2012:177).

According to Kitila *et al.* (2014:26), regarding the foetal outcomes in 253 (80.0%) of the cases, Apgar scores at 5th minutes was more significant than or equals to seven, 44 (14.1%) and were admitted to special nursery unit. In this study, not all 340 delivery records were reviewed, and the results cannot be generalised as the study was conducted in one hospital only. This is consistent with the study by Mdoe (2012:20) where there were 53 newborns with Apgar scores less than seven at 5 minutes. Substandard foetal heart rate monitoring had a significant statistical association with adverse Apgar scores less than seven at 5 minutes and stillbirth. (foetal outcomes P-value = 0,033). Neonates were admitted to the neonatal unit, and the reasons were low Apgar scores of 5 to 3. The study was conducted with a small sample and at one hospital implying that results could not be generalised. This is similar to the study by Mulondo *et al.* (2013:8) as it was revealed that lack of skills in taking and recording blood pressure correctly resulted in unnoticed high blood pressure leading to placental insufficiency, causing foetal distress and low Apgar scores for neonates. This was also confirmed in the study by Jere (2014:26) where it revealed that 71.8% (46/64) of infants delivered had an Apgar score of more than 5/10 at one minute. Twenty-five per cent (25%) (16/64) of infants had low Apgar scores of less than 5/10 at 1 minute. All these were due to partogram utilisation where the woman was subjected to undiagnosed prolonged labour. The findings of

the results cannot be generalised as it was conducted at one hospital. This was also consistent with the study by Ubaid, *et al.* (2013:42), which showed that 18 of the neonates were observed with poor Apgar score (< 6). On the other hand 82 (82%) neonates were observed with good Apgar score (> 6) at one minute where partogram was utilised. Even though the study showed positive results with the use of the partogram, it was conducted at one hospital where results could not be generalised. This was similar to the study by Tayade and Jadhao (2012:258) as it was confirmed that if the partogram were used in the control group, 10% of babies had 1min Apgar score below 7. Six percent (6%) of babies had 5 min Apgar score below 7, and 1% of babies had 10 min Apgar score below 7. This baby later succumbed to respiratory distress. In the control group with five min Apgar scores below 7, four babies had an extended stay in the Neonatal Intensive Care Unit (NICU). However, results could not be generalised as the study was conducted on a small sample size and one clinical facility.

2.4.2 Early Neonatal Mortality

This refers to the death of a neonate within the first week of life (Harrison, 2010:2). In the study conducted by Jere (2014:28), early neonatal deaths occurred in 7.8% (5/64) of infants. The study revealed that neonates who died within 24 hours had a low Apgar score of less than 5/10 at 5 minutes and that 24(7.7 %) of neonates died during the first six hours of delivery. However, the causes of neonatal deaths were not indicated on the respective partograms. The findings of the study could not be generalised as it was conducted at one hospital. This was also confirmed by Ubaid *et al.* (2013:42) where the study revealed 2 (2%) of neonatal deaths occurred as a result of non-utilisation of the partogram. Similarly, the study could not be generalised as it was conducted at one hospital. Adesola *et al.* (204:689) conducted a study on partogram utilisation, and it was revealed that non-utilisation and inappropriate utilisation of the partogram in maternity units to monitor the progress of labour had implications for increased neonatal morbidity and mortality. The study did not indicate neonatal outcomes in their results but acknowledged that adverse outcomes were there. The sample size was small, implying that results could not be generalised.

2.4.3 Fresh Stillbirth

This refers to a neonate over 500g in weight irrespective of gestation that shows no signs of life after delivery (Harrison, 2010:2). Jere (2014:28) reveals that of women delivered, fresh stillbirth occurred in 1.6% (1/64). According to Moalusi (2011:29), significant associations were found between the completion of the following aspects of the partogram and the mode of delivery. This is where partograms of mothers with perinatal deaths had been poorly completed; recording of risk level, monitoring of cervical dilatation, the descent of the foetal head, action line crossed and recording of identified problems. Findings of this study may not represent all hospitals in the province as it was conducted at one hospital only and the sample size was also not indicated. This is similar to the study by Mdoe (2012:20) where there were 17 fresh stillbirths. This is consistent with a study conducted by Kabkyenga *et al.* (2011:55) where it was revealed that overall, the perinatal mortality rate was 74 per 1000 total births including stillbirths and only 19 (3.5%) partograms were satisfactorily documented. In this study, results can be generalised though reviewing records alone was not sufficient.

The study by Bor (2010:21) revealed that there were two fresh stillbirths among those managed without the use of a partogram, and none of those who were exposed. The difference was statistically significant (RR2, 95%CI 1.1-2.4, P=0.047). However, the results cannot be generalised as the study was conducted at a district hospital only. This was also confirmed in the study by Ubaid *et al.* (2013:42) which indicated that the WHO trial revealed a marked fall in intrapartum stillbirths from 0.5% to 0.3% with the implementation of partogram in the labour management. Results of this study could not be generalised as it was conducted at one hospital.

2.4.4 Hyperbilirubinaemia

It is defined as the excessive amount of bilirubin in the blood, which is indicative of haemolytic processes due to blood incompatibility, intrauterine infection, septicaemia and other disorders (Davidson, London & Ladewig, 2010:1216). Usually, the bilirubin concentration in the serum is low at birth, less than 35 µmol/l and then climbs steadily for the first few days before returning to an adult level of less than 35 µmol/l by two weeks (Perinatal Education Programme, 2014:164). When the red blood cells break down, a substance called bilirubin is formed, and new-born babies are unable

to get rid of bilirubin which can build up in the blood and other tissues. Bilirubin, as it has a pigment, causes yellowish discolouration of the baby's skin, eyes and other tissues.

In a comparative study by Sarsam *et al.* (2014: 435) on two World Health Organisation (WHO) partograms, it had been significantly found that hyperbilirubinaemia as the neonatal outcome was high in both groups. This was the composite partogram which included the latent phase and the simplified partogram without the latent phase. The study was confined to one teaching hospital where results could not be generalised. This is similar to the study conducted by Rani and Laxmi (2016:317) which indicated that partogram pattern is highly significant ($P < 0.0001$) with a maximum number of babies showing neonatal jaundice. The study was conducted using a small sample size, therefore could not be generalised.

2.4.5 Meconium Aspiration Syndrome

It is defined as the aspiration of meconium-stained amniotic fluid, which can occur before, during, or immediately after birth. In utero, the foetus subjected to severe hypoxia may expel meconium and inhale the substances into the lungs during gasping leading to airway obstruction, mucosal damage, pulmonary vasoconstriction and impairment of surfactant production (Harrison, 2012:187). It is also defined as the respiratory disease of the term, post-term and small for gestational age newborns caused by inhalation of meconium-stained amniotic fluid or meconium into the lungs. This is characterised by mild to severe respiratory distress, hyperextension of the chest, hyperinflated alveoli and secondary atelectasis (Davidson *et al.*, 2010:1218).

In a study by Sarsam *et al.* (2014:435) on two WHO partograms, it was found that meconium aspiration syndrome as a neonatal outcome was high in both groups. These groups are the composite partogram which included the latent phase and the simplified partogram without the latent phase. Meconium aspiration syndrome was significantly more frequent in composite partogram, the one that is used in Bojanala District. The study should have compared equal numbers of both partograms, instead, 340 were monitored with composite partogram, and 330 were monitored with simplified partogram. Bias was identified in this study as it appeared like the researcher preferred the simplified partogram over the composite partogram. The

study was confined to one teaching hospital where results could not be generalised. Similarly, Mdoe (2012: 20) confirmed that meconium aspiration, substandard recordings of foetal heart rate and uterine contractions were significantly associated with adverse foetal outcomes. The study was conducted with a small sample and at one hospital implying that results could not be generalised.

2.4.6 Sepsis

Sepsis neonatorum is infections experienced by new-born babies during the first month of life (Davidson *et al.*, 2010:1223). It also refers to generalised infection of the bloodstream with bacteria which may have colonised the infant before, during or after birth caused by either Gram-positive such as Staphylococcus and Group B Streptococcus or Gram-negative bacteria such as Escherichia coli, Klebsiella and Pseudomonas (Perinatal Education Programme, 2014:230). It is often a complication of a local infection, such as pneumonia, umbilical cord or skin infection. According to Sarsam *et al.* (2014: 435), sepsis was found to be more frequent as a neonatal complication in both composite and simplified partograms but was found to be more on a composite one that is used in South Africa. The study was confined to one teaching hospital where results could not be generalised.

2.4.7 Birth asphyxia

Asphyxia is a failure to initiate breathing at birth associated with foetal hypoxaemia which can result in death, or brain damage (Harrison, 2012:166). According to Sarsam *et al.*, (2014:435), birth asphyxia was found to be more in the composite partogram as an outcome compared to a simplified type of a partogram. This was similar to the study conducted by Rani and Laxmi (2016:317) where it was revealed that partogram pattern is highly significant ($P < 0.0001$) with a maximum number of babies showing no complications with a percentage of 87.5% while 4.5% had birth asphyxia. However, the study was confined to one teaching hospital with a small sample size and results could not be generalised.

2.4.8 Transient tachypnea of new-born or Wet Lung Disease.

It is defined as a respiratory distress condition, which occurs due to retention of lung fluid or delay of absorption of lung fluid causing a temporary decrease in lung compliance (Perinatal Education Programme, 2010:187). In the study by Sarsam *et*

al. (2014:435), it was revealed that transient tachypnea or wet lung disease was found to be more as a neonatal birth outcome on the composite type of a partogram. Findings of this study could not be generalised as it was conducted at one teaching hospital.

2.4.9 Respiratory distress syndrome

It is respiratory distress developing as a result of a first absence, deficiency and alterations in the production of pulmonary surfactant in the immature lungs at birth (Perinatal Education Programme, 2014:185). In the study conducted by Sarsam *et al.* (2014:435), it was revealed that respiratory distress syndrome was more in the composite type of a partogram than the simplified one. Findings of this study could not be generalised as it was conducted at one teaching hospital.

2.4.10 Hypoxic-Ischaemic Encephalopathy or Neonatal Encephalopathy

It is the most common cause of neurologic impairment observed in babies causing brain damage because of asphyxia before, during and after delivery (Harrison, 2012:144). It is the cause of most neonatal deaths in full-term babies at birth that presents with inability to suckle, increased the tone of limbs, floppy neck, a tense fontanelle, increase in head circumference and has a history of prolonged labour. A comparative study by Sarsam *et al.* (2014:435) revealed that neonatal encephalopathy was another birth outcome although it was found to be more on the composite partogram than the simplified type.

2.5 SUMMARY

This chapter discussed reviewed literature relevant to partogram utilisation, plotting and partogram utilisation on maternal and neonatal outcomes. The literature reviewed concluded that a partogram is an inexpensive tool that can prevent and reduce maternal and perinatal morbidity and mortality. A significant number of researchers have confirmed that if the partogram is not utilised and interpreted according to the set standards, it results in adverse maternal and foetal-neonatal outcomes. Although different types of partograms exist in the literature reviewed, outcomes were similar in developed and developing countries. The research conducted on partogram utilisation suggests that this tool is underutilised and when it is used, the recordings on it seem to be substandard rendering the tool ineffective.

The partogram has been proven effective in preventing prolonged labour, reducing operative intervention, and improving maternal and neonatal outcomes. Studies also confirm that most maternal and perinatal deaths and morbidity are associated with partogram utilisation and could have been prevented. The research methodology is discussed in the next chapter after having conducted a quantitative cross-sectional study to describe utilisation of the partogram by qualified midwives and other healthcare practitioners in selected healthcare facilities.

CHAPTER 3

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

This chapter discusses the research approach, design, setting, study population, study sample, the pilot study, data collection, including the research instrument used for data analysis and ethical considerations.

3.2 RESEARCH APPROACH

The researcher used the quantitative approach as a means for testing objective theories by examining the relationship between variables (Creswell, 2009:4). In this study, variables of the partogram, as well as their relationship to the maternal and neonatal outcome, were examined. The researcher adapted a descriptive cross-sectional design because it is used to identify problems with current practice and to justify current practice, make judgments and determine what other professional are doing in similar situations (Brink, van der Walt & van Rensburg, 2013:115). The researcher attempts to determine and describe the utilization of partogram at Bojanala District.

3.3 RESEARCH SETTING

This study was conducted in the labour wards of selected health care facilities rendering maternity and delivery services at Bojanala District. The district is situated in the East of the North-West Province, and it is comprised of five sub-districts namely: Rustenburg, Madibeng, Moretele, Moses Kotane and Kgetleng as indicated in **Figure 3.1**. The researcher omitted Moretele because the sub-district refers all their patients to hospitals in Gauteng Province. The study was conducted in one provincial hospital in the Rustenburg sub-district, two district hospitals at Moses Kotane and Kgetleng sub-districts, four health centres and one Midwives Obstetric Unit (MOU) at Madibeng and Rustenburg sub-districts.

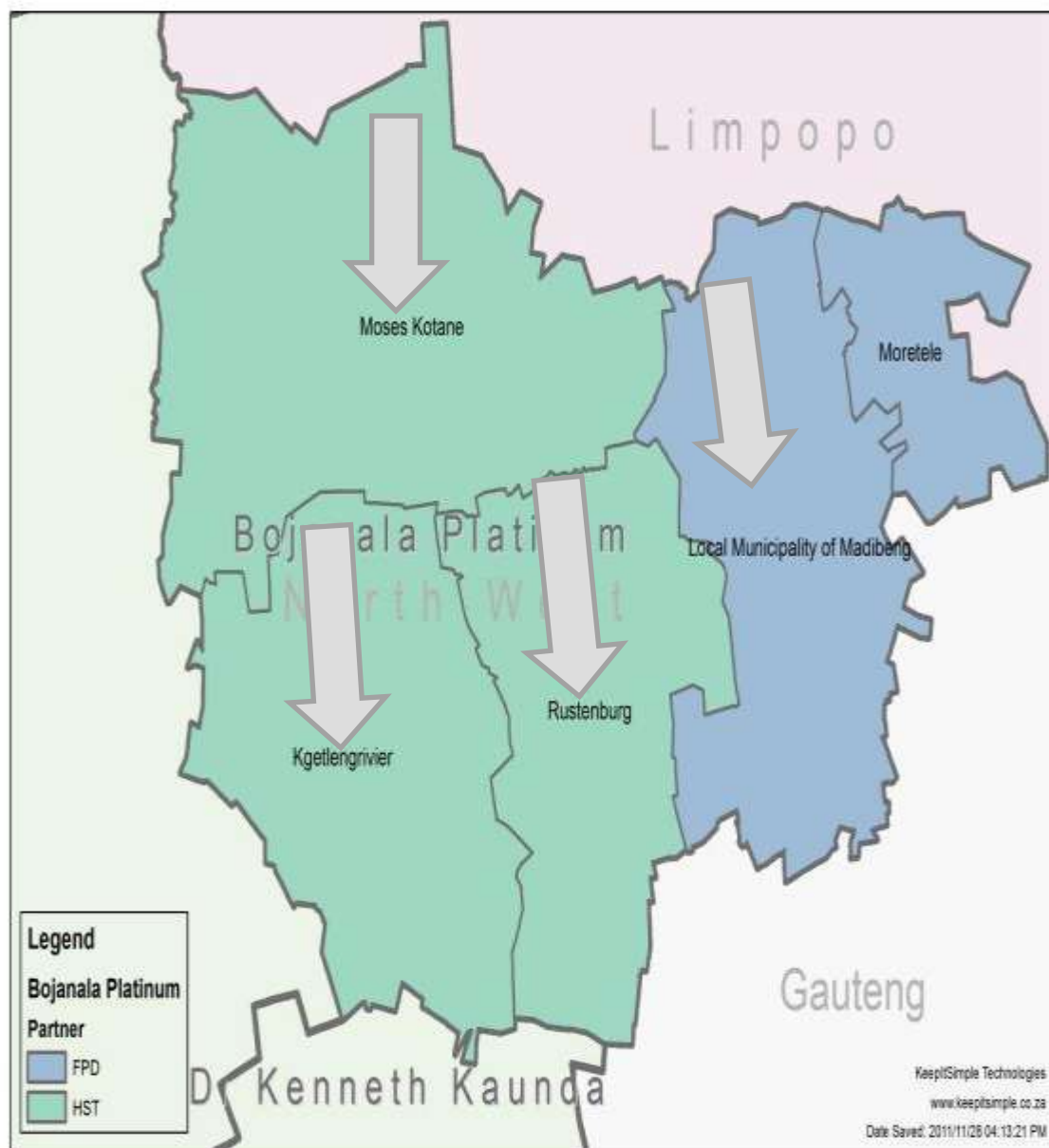


Figure 3.1 - Bojanala Map

3.4 POPULATION

In this study, elements under investigation were plotted partograms of all selected healthcare facilities in Bojanala District within the past six months of data collection because the researcher wanted to evaluate the recent practice of midwives regarding partogram utilisation. The population is defined, as everyone in the world who meets criteria for the people the researcher is interested in studying (Brink *et al.*,

2012:131). The population is not restricted to human participants, but also the entire elements in which the researcher is interested (Polit & Beck, 2013:337).

3.4.1 Inclusion Criteria

The inclusion criteria in this study were:

- Partograms for all women reporting for labour with cervical dilatation on admission of zero to five 5 cm
- Partograms for women who delivered at a gestational period of 37 weeks and more
- Partograms for all women delivered six months before data collection
- Partograms of women who delivered normally
- Partograms of women who were monitored during labour and later delivered by Caesarean section.

3.4.2 Exclusion Criteria

The exclusion criteria in this study were:

- All partograms of women appearing in the delivery register but delivered in transit, either in ambulances or private vehicles and home were excluded in the study because nothing about their labour process was documented.
- All partograms of women appearing in the register with the following characteristics:
 1. Admitted with cervical dilatation >5cm
 2. Booked for elective caesarean section
 3. Premature labour
 4. Placenta praevia and placental abruption.

3.5 SAMPLING METHOD

The researcher adopted a simple random sampling exercise because each participant had an equal and independent chance of being withdrawn and included in the study (Brink *et al.*, 2012:135). Random sampling means that each of the population group had a more significant than zero opportunity to be selected for the sample (Grove, Burns & Gray, 2013:356). The researcher obtained a list of all plotted partograms including maternal deaths and then created a sampling frame.

The researcher used a fishbowl technique with replacement to randomly select a sample from each healthcare facility. The total population was 908, and the total sample was 279.

3.6 SAMPLE SIZE

The process of calculating a sample size was designed and summarised as seen below. The sample size was determined using Raosoft sample size calculator available at <http://www.raosoft.com>. The margin error was set at 5% with a confidence level of 95%. The response distribution was set at 50% using the following formulae:

$$X = Z (c/100)^2 r(100-r)$$

$$N = N_x / ((n-1) E^2 + x)$$

$$E = \text{Sqrt} [(N - n) x / n (N! - 1)]$$

N = the population size

r = the fraction of responses that one is interested in

Z(c/100) = the critical value for the confidence level c.

Table 3.1 Process of calculating the sample size

Health Care Facility	Population- Plotted Partogram	Sample
A	103	30
B	100	29
C	80	24
D	200	75
E	102	30
F	123	35
G	140	40
H	60	16
TOTAL	908	279

3.7 ETHICAL CONSIDERATIONS

3.7.1 Permission to conduct the study

The researcher presented the research proposal to the Department of Nursing Sciences' Research Committee of the North-West University, Mafikeng Campus. The research proposal was later presented to the Ethics Committee of the North-West University, and obtained ethical clearance numbered NWU-00053-13-A9 (**Appendix 3**). The researcher then presented the research proposal to the North-West Department of Health in the presence of the supervisor where approval was later obtained (**Appendix 2**). The researcher also requested, in writing, from the Sub-District Managers and Chief Executive Officers of selected healthcare facilities, permission to conduct the study and subsequently obtained permission (**Appendices 6, 8, 10, 12, and 14**). Upon obtaining permission, the researcher explained the title of the study, the purpose, the researcher's status as a student and supervisors of the project to managers of facilities under investigation.

3.7.2 Confidentiality and Anonymity

The checklists were assigned numerical identifiers, and the researcher did not mention participating clinical facilities by names in the study. The clinical facilities under investigations were only identified as selected health care facility "A, B, C, D, E, F, G, H" (**Table 3.1**). As data were collected, names of participants were not recorded on the tool, and this was done to safeguard the anonymity of the owners of the files. The researcher collected data and did not use anyone else to collect data. Data were collected in a private room where no one could know the identity of the owners of the records. Furthermore, the completed checklists were stored in a locked cupboard that could only be accessed by the researcher. No employees could be able to link clinical data to any patient under their care. A brief description of the outcomes of the study would be provided to all stakeholders verbally and in a written form after the study had been completed.

3.8 DATA COLLECTION

3.8.1 The data collection tool

The tool used for the collection of data was a checklist (**Appendix 4**) that was developed by the researcher and written in English. The tool had a key where during

auditing; a tool number would be assigned and indicate whether the item was recorded (1) or not recorded (0) or not applicable by using a tick. Incomplete recording was ticked as not recorded. The design of the checklist is a table format divided into two sections namely the latent and the active phases of labour. Each section has so many criteria items: (The Number of recorded items/The-total number of items = Score obtained). Poor recording = from a score of 60 % downwards and imply poor or non-utilisation. Good recording = from a score of 70% and more, implying imply optimal utilisation of the partogram.

The checklist is based on all patients' information that appeared on the composite partogram that should be logged on the admission of a woman during labour recorded as follows: the patients' name, parity, gravida, pelvic assessment, duration of labour on admission, duration of rupture of membranes and risk factors. The researcher added parameters that should be recorded after monitoring the woman in labour during the latent and active phases of labour. The information was as follows: foetal conditions with its parameters, progress of labour and its parameters, maternal conditions and its parameters and the management plan (DoH, 2015:48).

3.8.2 Ensuring data collection quality

The researcher was assisted by a colleague to check the comprehensiveness of all checklists to ensure that all information had been correctly collected and recorded. During processing of data, the researcher and the colleague rechecked whether the information was complete or not to ensure consistency.

3.8.3 Data collection process

The researcher collected data from 1st September 2013 to 23rd September 2013 in the labour wards of selected healthcare facilities from 07h30 to 17h00 with breaks in between, by the researcher alone. The researcher evaluated partograms of deliveries conducted from the 1st March 2013 to 1st September 2013. The researcher, with the assistance of operational managers, used the maternity ward delivery register to check the total number of deliveries and later a review of the maternity case records of patients that delivered was carried out to evaluate partogram utilization whether recorded or unrecorded. The operational managers assigned ward clerks to assist with the retrieval of patients' records from the filing

room and those still in the ward. The researcher evaluated the following parameters: recorded or not recorded and not applicable:

- The patients' name, parity, gravida, pelvic assessment, duration of labour on admission, duration of rupture of membranes and risk factors
- Foetal condition: the researcher assessed the foetal heart rate, colour of liquor, caput and moulding
- Maternal condition: blood pressure and pulse rate, temperature, urine output and use of syntocinon or other drugs where applicable
- Progress of labour: descent of foetal head about the pelvic brim, level of the head of the ischial spines, cervical dilatation, effacement and uterine contractions
- Record of medication given and the management plan

The researcher also determined whether labouring women were assessed and managed according to set guidelines for labour monitoring. The second stage of labour was also assessed, whether it was recorded or not and the mode of delivery whether it was indicated as standard vaginal delivery or caesarean section. Neonatal and maternal outcomes were assessed; whether excellent or adverse and whether recorded or not recorded and what outcomes were recorded.

3.9 PILOT STUDY

The researcher conducted a pilot study on five files with similar characteristics that the researcher was interested in. These were not included in the primary study. Adjustments that were made after a pilot study were on the methodology and data collection instrument. A pilot study or preliminary study is a small-scale study conducted before the main study on a limited number of participants who meet the inclusion criteria but who will not form part of the sample (Brink *et al.*, 2012:174). This was done to investigate the feasibility of the proposed study and to detect the possible flaws with the methodology and the data collection tool. The following were added to the data collection tool: parity, gravida and pelvic assessment. The foetal condition with the baseline before and after the contraction was also added as well as the maternal and neonatal outcomes

3. 10 VALIDITY AND RELIABILITY

3.10.1 Validity

Validity refers to the ability of the instrument to measure the variable that it is intended to measure (Brink *et al.*, 2013:218). In this study, the data collection instrument was developed based on components of the partogram being the maternal condition, foetal condition and the progress of labour which has to be assessed during the latent and active phases of labour. This was to ensure content validity as well as the patient's name, parity, gravida, pelvic assessment, duration of labour on admission, duration of rupture of membranes and risk factors. The instrument was presented to the researcher's supervisor where it was evaluated to determine the suitability for use and whether it measured what it was supposed to measure and that which it did not measure. The checklist was also revised by other experts in the subject matter and the researcher's supervisor to verify the appropriateness. The supervisor, experts on quantitative research and on partogram utilisation and the statistician validated the appropriateness and accuracy of the research instrument.

3.10.2 Reliability

Reliability relates to the degree to which the instrument can be relied upon to yield consistent results if repeatedly used over time on the same person or by two researchers (Brink *et al.*, 2012:169). If used with a similar group of participants in a similar context, the instrument should yield similar results (Polit & Beck, 2013:416). The tool that was used obtained consistent results with the reliability scale used in the Statistical Package for Social Sciences (SPSS version 22). During data collection, the information to be completed on the partogram was consistently checked for completeness and incompleteness. The researcher also conducted a pilot study before the commencement of the primary study to determine whether the variables to be measured in the checklist were concise and clear, thus avoiding confusion.

3.11 DATA ANALYSIS

Data analysis refers to the systematic organisation and synthesis of the research data and the testing of hypotheses using those data (Polit & Beck, 2013:751).

Raw data were analysed using Statistical Package for Social Sciences (SPSS) software version 22. Frequency distributions and percentages was used on the description of partogram utilisation.

3.12. SUMMARY

This chapter presented the research design and methodology of the present study. The chapter explained the study setting, study design, study population and study sample. The process of calculating the sample size was also provided. The chapter also provided how the data collection instrument was designed, which parameters were addressed and how the instrument was to be utilised. All data collection variables were explained. The modifications on the instrument for data collection were also outlined. Validity and reliability were also discussed. A pilot study was conducted on five files with similar characteristics to the research sample that were not included in the main study. Frequency distributions and percentages was used on the description of partogram utilisation in selected health care facilities. Ethical considerations underlying the study were also outlined. In the following chapter, results of the study are presented in the form of tables, graphs and pie charts.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

This chapter describes the findings of the study. Two hundred and seventy-nine checklists were analysed on plotted partograms of all delivered women, those who were progressed and delivered normally, those who went through caesarean section and those who died intrapartally and postpartally.

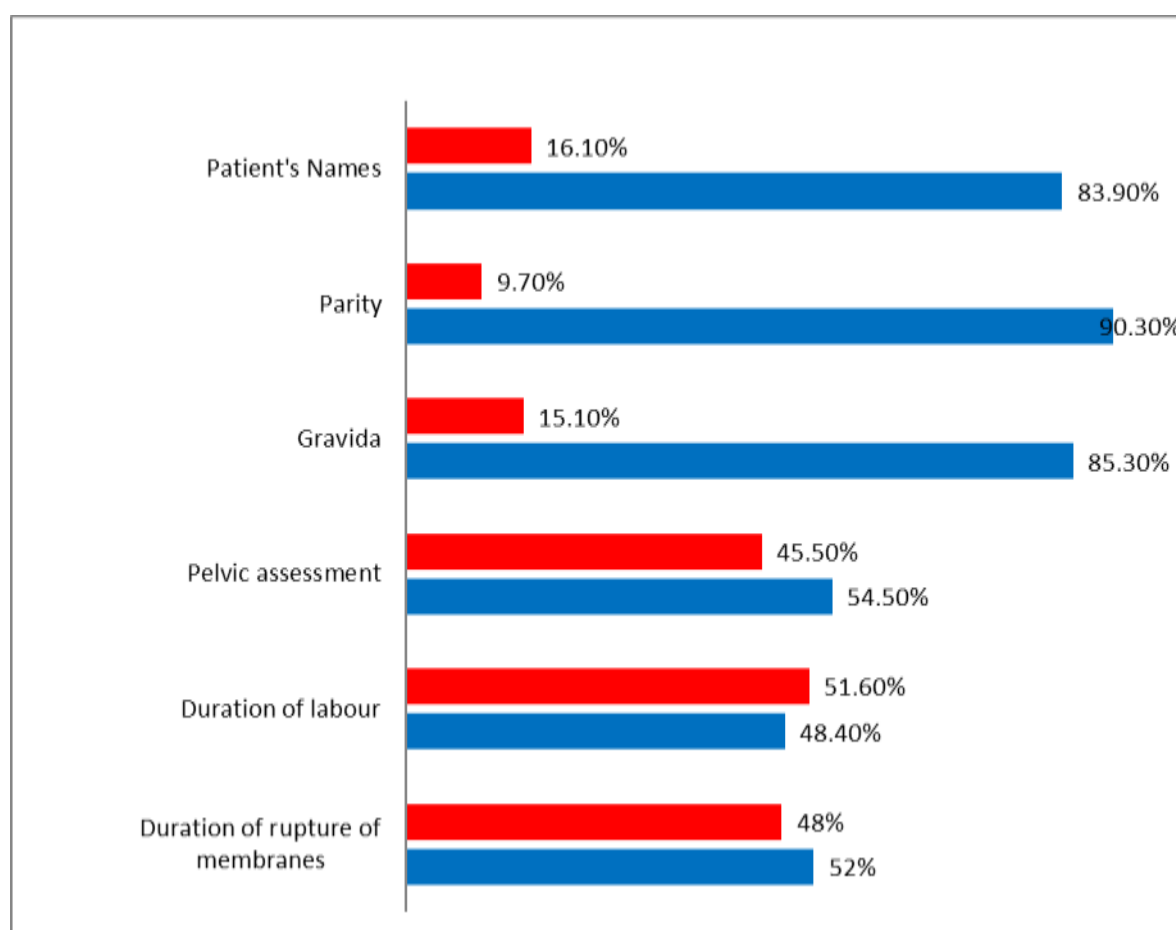
4.2 DETERMINATION OF RECORDING OF PARTOGRAM PARAMETERS

Partogram utilisation is based on the patient's name, gravida, pelvic assessment, duration of labour on admission, rupture of membranes and the identification of risk factors. The overall utilisation of partogram was calculated by determining the average percentage of all parameters of the partogram. The overall partogram average utilisation in this study was 20%. This indicates poor partogram utilization in Bojanala Sub district.

4.2.1 Patients' information to be recorded on admission

Out of all 279 checklists of plotted partograms, only 234 (83.9%) names of patients were recorded in the partogram while 45 (16.1%) had no names recorded. Parity was indicated in only 252 (90.3%) out of 279 cases, and 27 (9.7%) were not recorded. Out of 279, 238 (85%) had gravida recorded, and 41(15%) were not recorded. In this study 152 (54.5%) partograms had pelvic assessment recorded, and 127 (45.5%) were without a pelvic assessment. One hundred and thirty-five (135) (48.4%) partograms had an indication of the duration of labour on admission whereas 144 (51.6%) did not have such information. The duration of rupture of membranes upon admission during labour showed that 145 (54%) were not recorded while 134 (48%) were recorded. Patients' information to be recorded on the partogram on admission during labour is indicated in **Figure 4.1**.

Figure 4.1. Admission information to be recorded on the partogram



Not recorded



Recorded

4.2.2 Risk Factors

About 134 women delivered without knowing risk factors identified during pregnancy and upon admission on the partogram as seen in **Table 4.1**.

Table 4.1 Frequency distribution of risk factors identified on admission

Gravida		Frequency	Percent /%
Valid	Recorded	145	52.0
	Not recorded	134	48.0
	Total	145	52.0

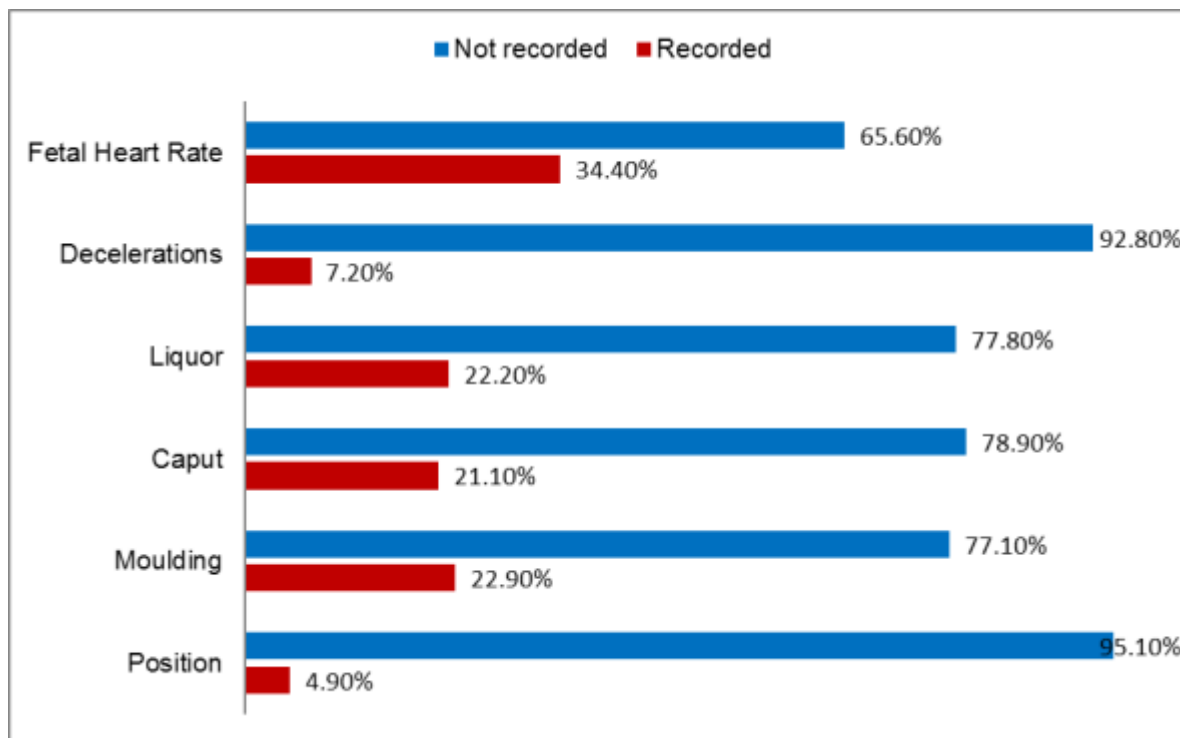
4.2.3 Partogram parameters during the latent phase of labour

The latent phase is diagnosed when the woman is in labour, and the cervix is <4 cm dilated and ≥ 1 cm long (DoH, 2015:46). The following information should be plotted in the partogram after a diagnosis of labour is made during the latent phase of labour: foetal conditions, the progress of labour and maternal conditions during the latent phase of labour and subsequent plotting if it is applicable.

4.2.3.1 Foetal Conditions

The foetal heart rate monitoring during the latent phase of labour indicated that out of 279 partograms, only 96 (34.4%) were recorded and a significant majority of 183 (65.6%) were not recorded. Decelerations recorded during the latent phase of labour were only 20 (7.2%) while 259 (92.8%) were not recorded, implying that the foetal status was not known. Liquor recorded was 62 (22.2%), and 217(77.9%) was not recorded. It was not known whether during the progress of labour membranes that were ruptured had clear liquor or not. Caput recorded was 59 (21.1%), and 220 (78.8%) was not recorded during the latent phase of labour. Moulding showed that 64(22.9%) were recorded while 215(77.1%) were not recorded. The position showed only 13(4.7%) were recorded while 265 (95.6%) were not recorded. All variables must be indicated during the latent phase of labour or an initial assessment of labour. Findings on foetal conditions were similar on initial assessment during the latent phase and subsequent monitoring as seen in **Figure 4.2**.

Figure 4.2 Partogram parameters during the latent phase of labour: Foetal conditions



4.2.3.2 Progress of labour

The cervical dilatation showed that in 279 cases, 86 (30.9%) were recorded while 193(69.2%) were not recorded. Cervical effacement showed that 21 (7.5%) were recorded and 258 (93.1%) were not recorded. Fifty-two (18.6%) of the station of the presenting part was recorded, and 227 (81.4%) were not recorded. Head above the brim recorded 10(3.6%) while 269(96%) were not recorded. Uterine contractions recorded were 59 (21.1%) while 220 (78.8%) were not recorded. Findings on the progress of labour as on **Table 4.2** were similar on initial assessment and during subsequent monitoring.

Table 4.2 Frequency distribution of partogram parameters during the latent phase of labour: Progress of labour

Cervical dilatation		Frequency	Percent /%
Valid	Recorded	86	30.8
	Not recorded	193	69.2
	Total	279	100.0
Cervical effacement		Frequency	Percent /%
Valid	Recorded	21	7.5
	Not recorded	258	93.1
	Total	279	100.0
Station of the presenting part		Frequency	Percent /%
Valid	Recorded	52	18.6
	Not recorded	227	81.4
	Total	Percent /%	100.0
Level of the head		Frequency	Percent /%
Valid	Recorded	10	3.6
	Not recorded	269	96.4
	Total	279	100.0
Uterine contractions		Frequency	Percent /%
Valid	Recorded	59	21.1
	Not recorded	220	78.8
	Total	279	100.0

4.2.3.3 Maternal conditions

The blood pressure and pulse were recorded at 26 (9.3%) and 253 (90.7%) were not recorded. Temperature recorded were on 27 (9.7%) partograms while 252 (90.4%) were not recorded. Urinalysis recorded were 23 (8.2%), and 256 (91.8%) were not recorded. Medication given during labour such as pain relief, intravenous fluids or antibiotics where needed showed that 27 (9.7%) were recorded and 252 (90.4%) were not recorded. Management plan on all parameters as indicated on 27 (9.7%) partograms, and 252 (90.4%) had none recorded as seen in **Table 4.3** below.

Table 4.3 Frequency distribution of partogram parameters during the latent phase of labour: Maternal conditions

Blood Pressure & Pulse		Frequency	Percent /%
Valid	Recorded	26	9.3
	Not recorded	253	90.7
	Total	279	100.0
Temperature		Frequency	Percent/%
Valid	Recorded	27	9.7
	Not recorded	252	90.4
	Total	279	100.0
Urinalysis		Frequency	Percent/%
Valid	Recorded	23	8.2
	Not recorded	256	91.8
	Total	279	100.0
Medication is given		Frequency	Percent/%
Valid	Recorded	27	9.7
	Not recorded	252	90.4
	Total	279	100.0
Management plan		Frequency	Percent/%
Valid	Recorded	27	9.7
	Not recorded	252	90.4
	Total	279	100.0

4.2.4 Partogram parameters during the active phase of labour

This phase is diagnosed when the woman is in labour when the cervix is ≥ 4 cm dilated and < 1 cm long (DoH, 2015:46). The progress of labour, foetal condition and maternal conditions should be plotted during this phase and subsequently where applicable.

4.2.4.1. Foetal conditions

The foetal heart rate baseline of 154(55.2%) were recorded, and 125(44.8) were not recorded. Decelerations recorded were only 37(13.3%), and those that were not recorded were 242(86.7%). Sixty-nine (69) (24.7%) liquor were recorded, and

210(75.3%) were not recorded. Eighty-eight (88) (31.5%) of caput were recorded, and 191(68.5%) were not recorded. Eighty-five (85) (30.5%) of moulding were recorded, and 194(69.5%) were not recorded. The position showed 29 (10.4%) that were recorded, and 250 (92.1%) were not recorded. Similar findings were revealed during the subsequent monitoring during the active phase of labour as seen in **Table 4.4**.

Table 4.4 Frequency distribution of partogram parameters: foetal conditions

Foetal Heart Rate		Frequency	Percent /%
Valid	Recorded	154	55.2
	Not recorded	125	44.8
	Total	279	100.0
Decelerations		Frequency	Percent /%
Valid	Recorded	37	13.3
	Not recorded	242	86.7
	Total	279	100.0
Liquor		Frequency	Percent /%
Valid	Recorded	69	24.7
	Not recorded	210	75.3
	Total	279	100.0
Caput		Frequency	Percent /%
Valid	Recorded	88	31.5
	Not recorded	191	68.5
	Total	279	100.0
Moulding		Frequency	Percent /%
Valid	Recorded	85	30.5
	Not recorded	194	69.5
	Total	279	100.0
Position		Frequency	Percent /%
Valid	Recorded	29	10.4
	Not recorded	250	89.6
	Total	194	69.5

4.2.4.2 Progress of Labour

Cervical dilatation recorded were 129(46.2%), and 150(53.8%) were not recorded. Cervical effacement showed 24(8.6%) recorded and 56 (91.4%) not recorded. Sixty (60) (21.5%) station of the presenting part were recorded, and 219(78.5 %) were not recorded. Head above the brim recorded were 22 (7.9%), and 257 (92.1%) were not recorded. Eighty-three (83) (29.7%) uterine contractions in 10 minutes were recorded, and 196(69.9%) were recorded between 20 and 40 minutes and above 40 minutes as indicated in **Table 4.5** below.

Table 4.5 Frequency distribution of partogram parameters: progress of labour

Cervical Dilatation		Frequency	Percent / %
Valid	Recorded	129	46.2
	Not recorded	150	53.8
	Total	279	100.0
Cervical Effacement		Frequency	Percent / %
Valid	Recorded	24	8.6
	Not recorded	255	91.4
	Total	279	100.0
Station of the presenting part		Frequency	Percent / %
Valid	Recorded	60	21.5
	Not recorded	219	78.5
	Total	279	100.0
Level of the head		Frequency	Percent / %
Valid	Recorded	22	7.9
	Not recorded	257	92.1
	Total	279	100.0
Uterine Contractions		Frequency	Percent / %
Valid	Recorded	83	29.7
	Not recorded	195	69.9
	Total	279	100.0

4.2.4.3 Maternal Conditions

Out of 289 partograms, only 42 (15.1%) had the blood pressure and pulse recorded, while 237(84.9%) were not recorded. The temperature recorded were at 34(12.2%), and 245(87.8%) were not recorded. Twenty (20) (7.2%) urinalysis were recorded, and 259 (92.8%) were not recorded. Medication given during labour such as pain relief, intravenous fluids or antibiotics where needed showed that 15 (4.7%) were recorded and 264 (95.3%) were not recorded. Similar findings were revealed during the subsequent monitoring of the maternal conditions during the active phase. The management plan recorded were 16 (5.7%), and 263(94.3%) were not recorded.

Table 4.6 presents the frequency distribution of maternal conditions during the active phase of labour.

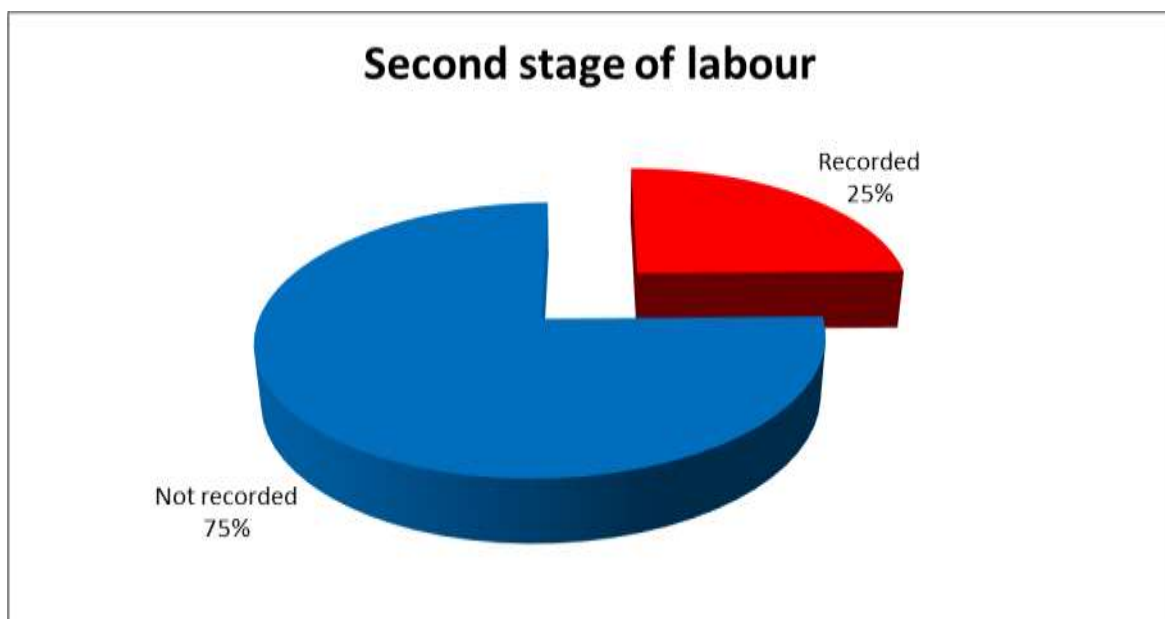
Table 4.6 Frequency distribution of partogram parameters: maternal conditions

Blood Pressure & Pulse		Frequency	Percent / %
Valid	Recorded	42	15.1
	Not recorded	237	84.9
	Total	279	100.0
Temperature		Frequency	Percent / %
Valid	Recorded	34	12.2
	Not recorded	245	87.8
	Total	279	100.0
Urinalysis		Frequency	Percent / %
Valid	Recorded	20	7.2
	Not recorded	259	92.8
	Total	279	100.0
Medication given		Frequency	Percent / %
Valid	Recorded	15	4.7
	Not recorded	264	95.3
	Total	279	100.0
Management Plan		Frequency	Percent / %
Valid	Recorded	16	5.7
	Not recorded	263	94.3
	Total	279	100.0

4.2.5 Second stage of labour

The second stage of labour is transitional and begins from the time the cervix is fully dilated or 10 cm dilated up to the time the foetus is ultimately expelled from the birth canal (DoH, 2015:49). Knowledge of the commencement of the second stage of labour assists in diagnosing the prolonged second stage of labour which causes postpartum haemorrhage and birth asphyxia. In this study, 69 (24.7%) partograms had the second stage of labour recorded, and 210 (75.2%) of partograms had no recording as seen in **Figure 4.3**.

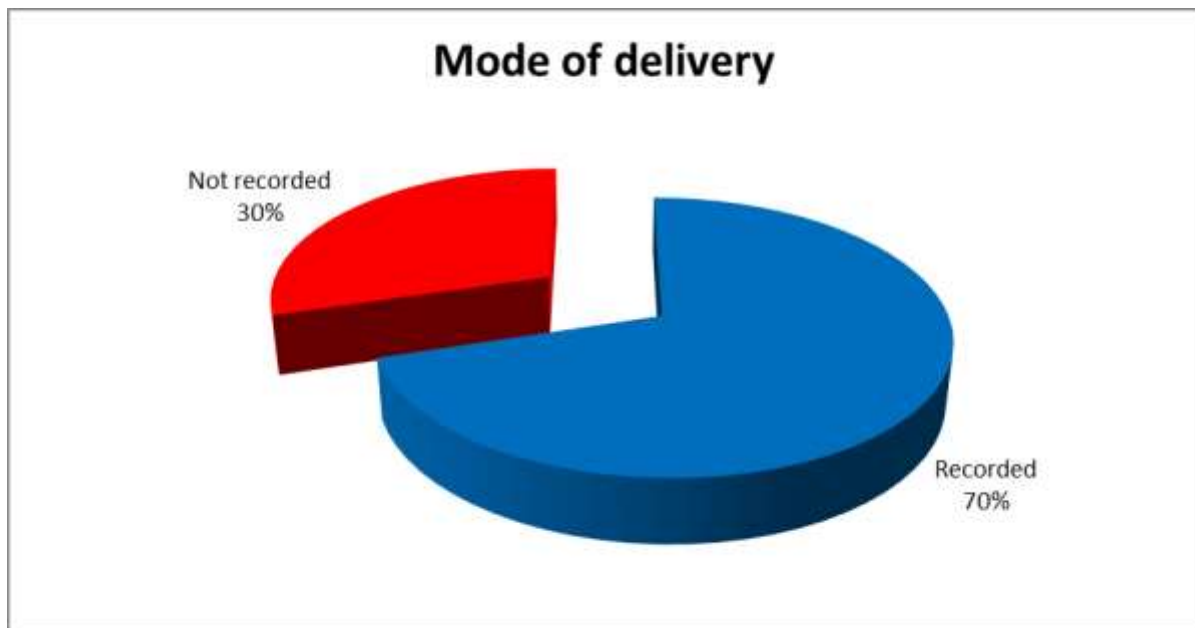
Figure 4.3 Frequency distribution of the second stage of labour



4.2.6 Mode of Delivery

The mode of delivery recorded was at 196 (70.3%) partograms, and 83(29.7%) were not recorded. Of those recorded, others were spontaneous vaginal delivery and others were deliveries by Caesarean section. **Figure 4.4** below presents the mode of delivery as recorded and not recorded.

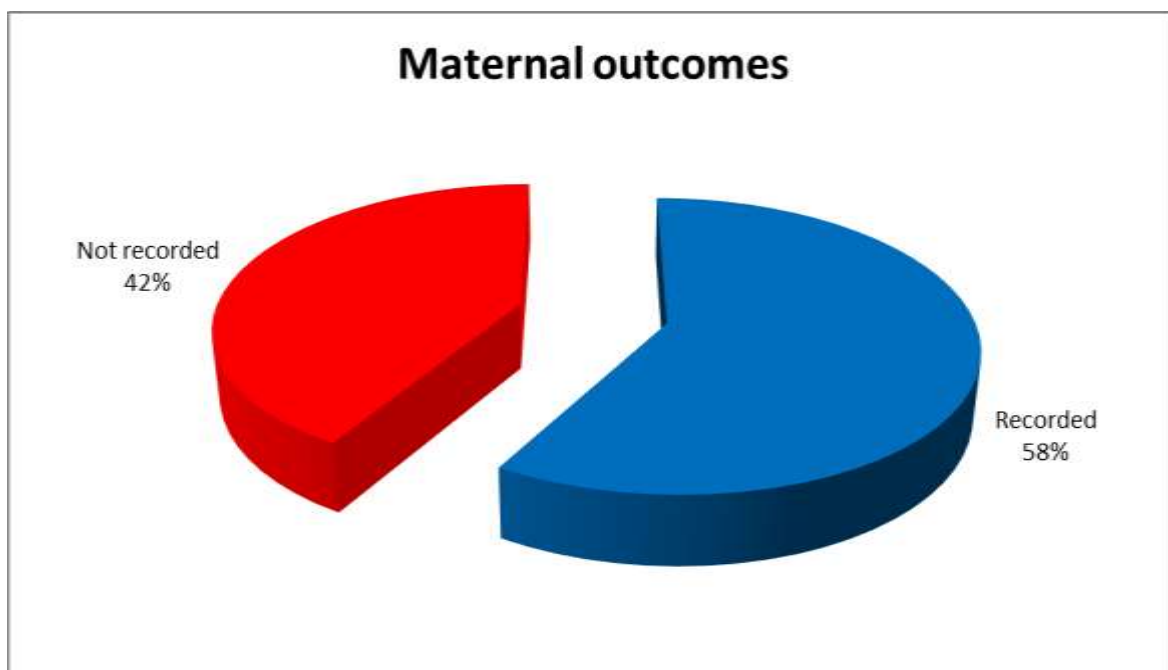
Figure 4.4 Frequency distribution of the mode of delivery



4.2.7 Maternal Outcomes

Maternal outcomes recorded were only 163 (58.4%) partograms, and 116 (41.6%) were not recorded. Of all the outcomes recorded, there were excellent and adverse maternal outcomes. **Figure 4.5** below presents recorded and unrecorded maternal outcomes.

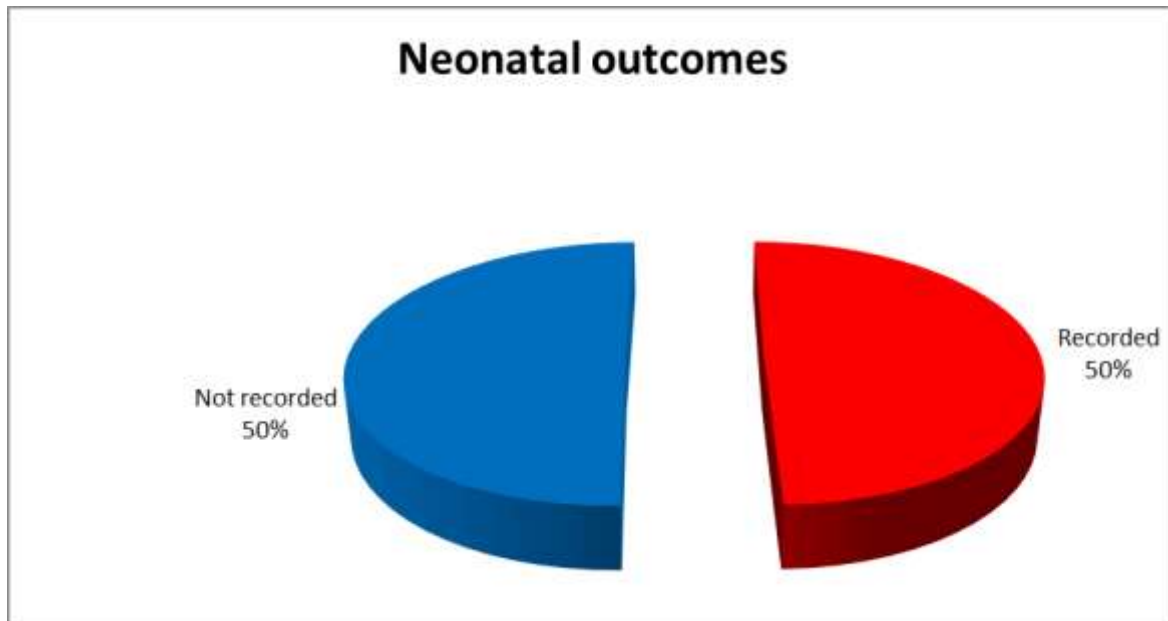
Figure 4.5 Frequency distribution of the maternal outcomes



4.2.8 Neonatal Outcomes

Neonatal outcomes recorded were at 139(49.8%) partograms, and 140(50.2%) were not recorded. Of all outcomes recorded, there were progressive and adverse neonatal outcomes. **Figure 4.6** below presents recorded and unrecorded neonatal outcomes.

Table 4.6 Frequency distribution of the neonatal outcomes



4.3. SUMMARY

This chapter presented results according to variables from the checklist. Findings were grouped into parameters that were recorded on the partogram during all phases of labour on the admission of a woman, foetal conditions, progress of labour and maternal conditions. Findings of parameters during the second stage of labour were also presented as well as the mode of delivery, maternal and neonatal outcomes. Average utilisation in this study during all phases of labour and during the second stage of labour was 20% partogram utilisation with 80% of partogram non-utilisation. The study revealed that a significant percentage of patients' information was recorded on the admission of a woman during labour. It was also revealed that partogram parameters were not recorded according to the standard on the foetal and maternal condition and the progress of labour during all phases of labour. In the following chapter five, results from the study are discussed and compared with other relevant data.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

The purpose of this study was to evaluate partogram utilisation in selected healthcare facilities of Bojanala District. There was no shortage of partograms in all facilities under investigation as revealed by its presence in all files. This was contrary to the study by Mphasha, Govendor, Motloba and Barua (2016) where findings of their study revealed that there was the unavailability of the partogram in the unit in some files. This is mandatory in South Africa that all women in labour should be monitored using a partogram. In this study, it was revealed that high proportions of unrecorded parameters on the labour ward partograms in selected health facilities of Bojanala District, coupled with substandard monitoring of progress of labour might have played a significant role in the maternal, foetal and neonatal health outcomes. This study indicated that there was inadequate monitoring of parameters on the partogram against standards. Discussions of the results are based on the objectives of the study:

- To determine the frequency of recording of admission information
- To determine the frequency of recordings during the latent
- To determine the frequency of recordings during the active phases of labour
- To determine the frequency of recordings during the second stage of labour
- To determine overall utilisation of partogram in selected health care facilities in Bojanala District

5.2 DISCUSSION OF RESULTS

The results are discussed in accordance with the objectives in exception of the last objective that was realised during the data collection process.

5.2.1 Research Objective 1: Determination of recording of partogram parameters on admission

The study revealed that out of all 279 checklists of plotted partograms, only 234 (83.9%) names of patients were recorded in the partogram while 45 (16.1%) had no names recorded. The results indicated that 45 women were in labour without their names being recorded on the partogram and their identities were unknown. Parity is

another parameter that needs to be recorded. However, the study revealed that only 252 (90.3%) out of 279 cases and 27 (9.7%) delivered without their parity indicated in their partograms. This was contrary to the study by Jere (2014:24) where parity and gravida were indicated in all partograms. Knowledge of this may assist the midwives and other professional health care workers to be on the alert when managing a labouring woman whether she is a risk factor or not. Women who have given birth five times or more are at risk of pregnancy-labour related complications (Fraser *et al.*, 2010:239). This was similar to the study by Moalusi (2011:22) where it was revealed that 87.7% partograms had no risk factors recorded and 36.5 % were recorded to the standard.

The study also revealed that out of 279 partograms, 238 (85.3%) had gravida recorded and only 41 (14.7%) showed no recordings of gravida. Knowledge of gravida assists the midwives and other professional healthcare workers to be on alert when managing a pregnant woman because of risk factors associated with pregnancy and labour (Fraser *et al.*, 2010:239). The study also revealed that pelvic assessment was not recorded and this may be carried out as part of labour care if the presenting part is not engaged to exclude cephalopelvic disproportion regarding Fraser *et al.* (2010: 257). This might lead to prolonged and obstructed labour. Routine pelvic assessment is not recommended, but this may be carried out as part of labour care if the presenting part has not engaged. It is usually done to avoid diagnosing cephalopelvic disproportion until after the onset of labour. In this study, 152 (54.5%) of partograms had pelvic assessment recorded, and 127 (45.5%) were without a pelvic assessment. This was consistent to the study by Kip (2013:87) where it was revealed that failure to use partogram according to the standards, made it impossible for midwives and other healthcare providers to arrive at a timely and potentially life-saving diagnosis. The study further indicated that in total, 133 (93.0%), a significant percentage of the use of the partogram, was not according to the standard or it was incompletely utilised. Similarly, the Moalusi study (2011:21) revealed that aspects that were especially poorly completed included a recording of risk factors (87.1% not completed), recording the pelvis at 52.2% completed and 0% not recorded and 47% substandard recording.

The importance of recording the duration of labour on admission could assist in diagnosing whether the woman is in false labour, prolonged latent phase or

prolonged active phases of labour that predisposes to obstetric haemorrhage. This is a cause of maternal mortality in the country as indicated in the Saving Mothers Report (DoH, 2010: 11). Out of 279 checklists, only 135 (48.4%) partograms had an indication of the duration of labour on admission whereas 144(51.6%) did not have such information. The duration of the rupture of membranes upon admission during labour showed that 145 (54%) were not recorded while 134 (48%) were recorded on the partogram. The importance of recording the duration of the rupture of membranes assists in diagnosing the prolonged rupture of membranes because this puts both the mother and the foetus in utero at risk of infection. This was consistent to the study by Singh (2013:104) where it was confirmed that the duration of labour and duration of the rupture of membranes must be recorded as it can explain why some complications occur, such as prolonged rupture of membranes that leads to puerperal sepsis and prolonged labour to postpartum haemorrhage. It is essential to classify the woman upon admission during labour as high or low-risk to prepare for management and to reduce complications during labour. If risk factors are identified upon admission in labour, it makes it possible for healthcare professionals to be on alert and to prepare for appropriate management depending on the risk factor identified. One hundred and thirty-four (134) women delivered without having risk factors identified during pregnancy and upon admission. Risk factors identified indicated that only 145(54%) were recorded and 134(48%) were recorded on the partogram. This is consistent to Singh (2013: 104) where the risk factor was the only parameter that was recorded correctly in most of the charts (71.1%).

5.2.2 Research Objective 2: To determine the frequency of recordings of Partogram parameters during the latent phase of labour:

5.2.2.1 Foetal conditions

The foetal heart rate monitoring indicated that out of 279 partograms only 96(34.4%) were recorded and a significant majority of 183(65.6%) were not recorded. The foetal heart and state of liquor are the two most important parameters that are used to detect foetal distress (Mdoe, 2012: 27). In this study, the foetal heart rate baseline was not recorded according to the standard and based on this, there was a high probability of not diagnosing foetus distress in time. In the study conducted by Shokane (2011:23), it was revealed that failure to monitor and plot the foetal heart

rate two hourly in the latent phase of labour exposes the foetus to intrapartum asphyxia and the possibility of the woman delivering a stillbirth. Decelerations recorded during the latent phase of labour were only 20 (7.2%) while 259 (92.8%) were not recorded, implying that the foetal status was not known. Decelerations if present are a sign of foetal compromise of which if not detected, might lead to intrauterine death. This was also confirmed by Moalusi (2011:22) where 94.5% of partograms were not recorded.

Liquor recorded was 62 (22.2%), and 217 (77.9%) were not recorded. It was not known whether during the progress of labour membranes that were ruptured had clear liquor or not. The state of liquor is essential in monitoring the foetal status. Appearance or worsening meconium staining, scanty or absent liquor during artificial rupture may indicate foetal hypoxia and need to expedite delivery. In cases of abruption placenta and rupture of the uterus, the liquor may be bloodstained. This is confirmed by Masika., Katongole and Govule (2015:42) that the colour of liquor (24.4%) remained poorly monitored and therefore not documented to the desired level. Caput recorded was 59 (21.1%), and 220 (78.8%) was not recorded during the latent phase of labour. Moulding showed that 64 (22.9%) were recorded while 215(77.1%) were not recorded. The presence of excessive moulding is diagnostic of cephalopelvic disproportion and is a sign of obstructed labour which leads to an increase in perinatal and maternal mortality because of postpartum haemorrhage. The position showed only 13 (4.7%) were recorded while 265 (95.6%) were not recorded. All variables must be indicated during the latent phase of labour or an initial assessment of labour. Findings on foetal conditions were similar on initial assessment during the latent phase and subsequent monitoring. This is also consistent with the study conducted by Moalusi (2011:22) where 87.1% risk factors were not recorded. This is an indication that some parameters were recorded selectively or not recorded at all.

5.2.2.2 Progress of labour

In this study, it was revealed that out of out of 279, 86 (30.9%) of cervical dilatation were recorded while 193 (69.2%) were not recorded. This makes it impossible to recognise deviations from average on the progress of labour. This is confirmed by Moalusi (2011:24) where it was revealed that 32.5% had cervical dilatation which

was not recorded. This is consistent with Mdoe (2012:28) where all partograms had recordings of cervical dilatation though only 55.8% of them met the standard recordings. Cervical effacement showed that 21 (7.5%) were recorded and 258 (93.1%) were not recorded. Fifty-two (52) (18.6%) of the station of the presenting part in relation to the ischial spines were recorded, and 227 (81.4%) were unrecorded.

The station of the presenting part and head above the brim diagnoses obstructed labour, which causes prolonged labour or rupture of the uterus. Therefore, failure to record this makes it impossible to diagnose obstructed labour or cephalopelvic disproportion. In this study, the head above the pelvic brim recorded were 10 (3.6%) while 269(96%) were not recorded. This is similar to the study by Moalusi (2011:22) where it was revealed that 74.6% of the head above the brim was not recorded. The results were similar to Mdoe (2012:28) where it was found out that 89 (8.5%) of partograms had unrecorded descent of the head. Another parameter was the uterine contractions where 59 (21.1%) were recorded while 220 (78.8%) were not recorded. A significant number showed that contractions during this phase of labour were not recorded; making it impossible to say whether labour was progressing well or not and necessary interventions could not be taken. This is similar to the study by Moalusi (2011:22) where 49.5% had no contractions recorded. Findings on the progress of labour were similar on initial assessment and during subsequent monitoring during the latent phase of labour.

5.2.2.3 Maternal conditions

In this study, blood pressure and the pulse recorded were 26 (9.3%), and 253 (90.7%) were not recorded. Temperature recorded was in 27 (9.7%) partograms while 252 (90.4%) were not recorded. Urinalysis recorded was 23 (8.2%), and 256 (91.8%) were not recorded. In the study by Opoku and Nguah (2015:6), it was revealed that parameters about maternal well-being such as blood pressure, pulse and nature of urine were not recorded to standard in about 60% of cases. This is similar to the study by Masika *et al.*, (2015:42) and Moalusi (2012:22) where it was revealed that indicators for vital observations such as blood pressure (15.1%), pulse on admission and four hourly pulses (12.9% and 4.8% respectively) remained poorly monitored and therefore not documented to the desired level. Jere (2014:24) also

confirmed findings where it showed that temperature was documented entirely in 11% (18/162), while pulse rate and blood pressure were thoroughly documented in only 4.9% (8/162) of records of women. Urine output was documented entirely in only 7.4% (12/162) of the partograms. This is consistent with the study by Mathibe-Neke *et al.*, (2013:152) where it was revealed that the focus of recording on the partogram seemed to be directed on the progress of labour and the foetal heart rate with a limitation on the maternal well-being and other aspects of the foetal well-being. Medication given during labour, such as pain relief, intravenous fluids or antibiotics where needed, showed that only 27 (9.7%) were recorded and 252 (90.4%) were not recorded. The management plan on all parameters as indicated on 27 (9.7%) partograms, and 252 (90.4%) had none recorded. This implied that a significant percentage of labouring women during the latent phase and subsequent management had no vital signs taken. Therefore, nothing was planned for the management throughout the latent phase. Findings were similar to the ones revealed during the subsequent monitoring.

5.2.3 Research Objective 3: To determine the frequency of recordings of Partogram parameters during the active phase of labour:

5.2.3.1 Foetal conditions

The National Department of Health (2016:41) requires that the foetal heart rate be monitored half-hourly in the active phase of labour before and immediately after contractions and even with subsequent management. The ability to pick up abnormal foetal heart tracings is crucial to diagnosing foetal distress in labour. In the current study, the foetal heart rate was the only parameter where there was a significant percentage that was recorded at 154 (55.2%), and 125 (44.8) were not recorded. This is in line with the research by Mdoe (2012:27) and Opoku *et al.*, (2015:5) that the foetal heart rate is the most critical parameter used to detect foetal distress. Similarly, Jere (2014:23) also confirms that the significant percentage of 87.7% had the foetal heart rate recorded compared to other parameters. This was confirmed in the study conducted by Yisma, *et al.*, (2013:5) where 41.1% of the foetal heart rates were not recorded and 27,9% were judged to be substandard. They (*ibid*) also discovered that to achieve an excellent foetal outcome, it is critical to monitor the foetal condition during labour. Decelerations recorded were only 37(13.3%), and

those that were not recorded were 242(86. 7%).This is similar to the study by Moalusi (2011:53) where 53.9% were not recorded, and sections that were the least completed included monitoring decelerations (1.0%).

According to the DoH (2016:41), colour and odour of liquor should be monitored and recorded two hourly if the membranes have ruptured. In this study, 69 (24.7) were recorded, and 210 (75.3%) were not recorded. This is similar to the study by Kitila *et al.*, (2014:6) and Jere (2014:23), where states of membranes (liquor) were recorded in 1 (5.3%). However, in none of the cases, the moulding status of the foetal head was monitored to standard out of 340 reviewed maternal partograms. The state of liquor is vital in monitoring the foetal status. The appearance or worsening meconium staining, scanty or absent liquor during artificial rupture may indicate foetal hypoxia and need to expedite delivery. Eighty-eight incidents (31.5%) of caput were recorded, and 191 (68.5%) were not recorded. Eighty- five cases (30.5%) of moulding were recorded, and 194 (69.5%) were not recorded. Similarly, Yisma *et al.* (2013:5) confirm that in 364 (86.7%) of the 420 modified WHO partograms reviewed, the moulding of the foetal head was not recorded at all. In 26 (6.2%) and 30 (7.1%), it was plotted below the standard and up to the recommended standard respectively. The position showed 29 (10.4%) that were recorded, and 250 (92.1%) not recorded. Findings in this study suggest that midwives and other healthcare workers had problems with the recording of foetal conditions. Similar findings were revealed during the subsequent monitoring during the active phase of labour.

5.2.3.2. Progress of labour

The duration and frequency of uterine contractions should be monitored half hourly per ten minutes labour (DoH, 2016:41). In this study, 83(29.7%) uterine contractions in 10 minutes were recorded, and 196(69.9%) were not recorded between 20 and 40 minutes and above 40 minutes. The proportion that was not recorded indicated that progress of labour was not known and it is possible that labour could have been prolonged or obstructed leading to unnecessary interventions. This is similar to the study by Mdoe (2012:28) that uterine contraction was not recorded in 42 (4.0%) partograms, and among those partograms with records, 856 (81.4%) were substandard. Similarly, Jere (2014:24) also confirms that uterine contractions had 26.5% (43/162) as the least documented parameters on the progress of labour.

Cervical dilatation recorded was 129 (46.2%), and 150(53.8%) were not recorded. The vaginal examination has to be done two hourly noting cervical dilation, effacement and the station of the presenting part in relation to the ischial spines (DoH 2016:41). The study revealed that 129 (46.2%) of cervical dilatation were recorded and 150(53.8) were not recorded. Cervical effacement showed that 24 (8.6%) were recorded and 255 (91.4%) were not recorded. This study revealed that most patients delivered with the cervical dilatation and effacement were not indicated. This is confirmed by the study conducted by Kitila *et al.*, (2014:2) where labour parameters such as cervical dilation, station, uterine contractions, the interval of contraction, and duration of contraction were monitored to standard in 2(10.5%) of the cases out of 340 reviewed maternal partograms. Sixty (21.5%) of the station of the presenting part were recorded, and 219 (78.5 %) were not recorded.

Head above the brim recorded was 22 (7.9%), and 257 (92.1%) were not recorded. This is also confirmed in the study by Khonje (2012:67) where 4% of descent was correctly recorded, 37% adequately recorded, 44% inadequately recorded and 15% inadequately recorded. This corresponds with the study by Mdoe (2012:28), where it was that found 89 (8.5%) partograms had the unrecorded descent of the head. It is also confirmed by Opoku *et al.* (2015: 3) where it was revealed that about 44% of cases of cervical dilatation were not recorded to standard. Standard recordings of contractions were done in 60% of cases. The descent was adequately charted in 55% of cases and not charted at all in 25% of cases. A significant percentage of no recordings were seen on the station of the presenting part about the ischial spines, the level of the head of the pelvic brim and uterine contractions. These implied complications on the progress of labour were not known whether there was an obstruction or the mid pelvis was adequate or not. Some parameters were completed selectively or not recorded at all in this study. The progress of labour and its parameters were the most recorded although some parameters were not recorded according to the standard. This was similar to the study by Maina, Mutungwa-Muwenda and Karonjo (2017:82) and Jere (2014:24) where it was revealed that the progress of labour was frequently documented, maternal and foetal conditions were incompletely documented.

5.2.3.3 Maternal conditions

During the active phase of labour, it is required that the maternal pulse and blood pressure be monitored and recorded hourly (DoH, 2016: 41). In this study, it was revealed that 42 (15.1%) instances of blood pressure and pulse were recorded and 237 (84.9%) were not recorded. Blood pressure is essential for the identification of pre-eclampsia or impending eclampsia and is an essential indicator for the early identification of a ruptured uterus that is a possible complication of obstructed labour (Jere, 2014:35). It is also required that temperature is monitored four hourly and to test urine for protein and sugar when it has been passed (DoH, 2016:41). In this study, it was revealed that 34(12.2%) temperature recordings were recorded, and 245(87.8%) were not recorded. The assessment of temperature during labour is very important for early detection of maternal pyrexia, which is a sign of obstructed labour with impending rupture of the uterus or could signify maternal infection (Jere, 2014:36). In this study, a significant percentage of women delivered with an abnormal temperature that may have been missed was 7.2%. This is also similar to the study by Mdoe (2012:27) where some partograms had no records for maternal pulse rate and maternal body temperature.

The assessment of temperature during labour is very important for the early detection of maternal pyrexia which is a sign of obstructed labour with the impending rupture of the uterus. Alternatively, it could signify maternal infection (Jere, 2014:36). These findings were similar to the ones by Kitila (2014:2), where maternal parameters such as BP, pulse, and temperature. were completed to standard out of 340 maternal records. The study showed that a low percentage of 3(15.8%) of urine test results were recorded and 259 (92.8%) were not recorded at all which is similar to Singh (2014:104) where 41.3% was recorded. Doing the urinalysis is essential to detecting increasing dehydration in the mother, which happens during prolonged labour and obstructed labour. The percentage of ketones increases as the mother becomes more dehydrated, which further develops into acido-ketosis and then shock (Singh: 2013:106). All medication and fluids should be recorded during the active phase as well as identified problems and management plan (DoH, 2014:41). Medication given during labour such as pain relief, intravenous fluids or antibiotics where needed showed that 15 (4.7%) were recorded and 264 (95.3%) were not recorded. In this study, a significant percentage showed no recordings of medication

such as pain relief for which tension and pain in primigravida clients causes inefficient uterine action. As a result, there is inadequate cervical dilatation (Dippenaar & Da Serra, 2012: 419). Similar findings were revealed during the subsequent monitoring of the maternal conditions during the active phase. The management plan recorded was 16 (5.7%), and 263(94.3%) were not recorded. The percentage of noncompliance in partogram utilisation was high in this study considering the high adverse outcomes for the neonate and the mother that could have been prevented by the correct utilisation of the partogram. Kitila et al., (2014:3) further confirm where it was revealed that the overall level of documentation of the parameters in the majority were 16 (84.2%) of the cases monitored to substandard.

5.2.4 Research objective 4: To determine the frequency of recordings during the second stage of labour

In this study, 69 (24.7%) partograms had the second stage of labour recorded, and 210 (75.2%) of the partograms had no recording. In the researcher's view, no parameter was well documented more than the other. This shows problems such as prolonged second stage of labour might have been missed and possibly affected the outcomes of the mother and foetus. A significant percentage had no recording of the second stage of labour, and it could be that most women delivered by caesarean section without any indication. The study found the majority of women did not receive many observations during this stage of labour. This is similar to the study conducted by Kitila *et al.*, (2014:3) where none of the partograms fitted the first utilisation level criteria. The reason was that it was utilised only for 15/130 (11.5%) of the regular deliveries conducted at the unit and only 2(10.5%) of the critical parameters were monitored to standard. Similarly, this is confirmed by Opoku *et al.*, (2015: 6) where it was revealed that partogram use was 54%, a figure that is below the national figure of deliveries conducted by skilled attendants.

5.2.4.1 Mode of delivery

Mode of deliveries recorded were 196 (70.3%) partograms, and 83(29.7%) were not recorded. In obstetrics and midwifery practice, the history of previous deliveries whether standard vaginal delivery, assisted or caesarean section and the reason for undergoing such a delivery method are crucial as it helps in the decision making of the mode of delivery for the current pregnancy. Of those recorded, others were

spontaneous vaginal delivery and others were deliveries by caesarean section. Caesarean sections were mainly performed at a provincial hospital with few from district hospitals. Regular vaginal deliveries were from all health centres, clinics and all hospitals. Among the reviewed partograms, the caesarean section performed was found to be 29.7% with no indication for caesarean section recorded while with others, the partogram was there in the files but not utilised at all. The study showed a significant percentage of caesarean section rates as compared to the norm of 11%. This is similar to the study by Jere (2014:27) where it was revealed that most women 57.8% (37/64), delivered spontaneously, and a significant 37.5% (24/64) delivered by caesarean section. This is consistent with the study conducted by Moalusi (2011:39) where the rate of caesarean sections performed was found to be 16%, which is above the national norm of 11%. Similarly, Khonje (2012:75) concludes that there is a significant association between accurate monitoring, recording of the partogram and the mode of delivery. The study further revealed that more instrumental deliveries were carried out due to the incorrect usage of the partogram. This also confirms the importance of recording in the partogram to avoid subjecting the woman to an inappropriate mode of delivery. However, in the study, there were no instrument-assisted deliveries in all the partograms that were reviewed.

5.2.4.2 Maternal Outcomes

Maternal outcomes recorded were only 163 (58.4%) partograms, and 116(41.6%) were not recorded. Of all outcomes recorded, there were proper and adverse maternal outcomes. Adverse maternal outcomes in this study were postpartum haemorrhage, retained placenta, second and third degree perineal and cervical tears at all levels of care, caesarean section deliveries, maternal mortality at both district and provincial hospitals. This indicated that partogram utilisation had an impact on maternal outcomes. Contrary to Jere (2014: 27) and Moalusi (2011: 21) there was no maternal death in their study. This is consistent with the study by Mdoe (2012:29) where it was revealed that although the majority of women had spontaneous vaginal deliveries, only four had immediate maternal adverse outcomes compared with 16 who had a caesarean delivery. This was also confirmed by Kitila *et al.* (2014:4), where it was revealed that of all partograms reviewed 46(14.7%) were assisted deliveries, 34 (10.9%) were C/S deliveries, augmentation of labour were 54(17.3%) and 12 (3.8%) developed PPH. Similarly, in the study by Jere (2014:39) and Bor

(2010:21), maternal outcomes identified were caesarean section deliveries, postpartum haemorrhage, genital infection and perineal trauma, though without any significant statistical differences. This was contrary to the study by Ubaid *et al.* (2013:43) where it was revealed that no cases of obstructed, labour, PPH and ruptured uterus were reported in their study.

5.2.4.3. Neonatal outcomes

Neonatal outcomes recorded were on 139 (49.8%) partograms, and 140 (50.2%) were not recorded. Of all outcomes recorded, there were good and adverse neonatal outcomes. Adverse neonatal outcomes in this study refer to respiratory distress at all levels of care, meconium aspiration, transient tachypnea, severe birth asphyxia, fresh stillbirths and early neonatal death. Good neonatal outcomes refer to all live births that did not need resuscitation with an Apgar score of > 7 . The WHO and the National Department of Health (NDoH) expect the partogram to be used in all births attended to by skilled birth attendants in developing countries, South Africa included. Results of this study are similar to Mdoe (2012:28) where 89 newborns were admitted to the neonatal ward for specialised care. Among those admitted, 59.5% were due to Apgar scores less than seven at 5 minute also with abnormal breathing, and meconium aspiration contributed to nine and eight new-borns respectively. This is confirmed by Opoku *et al.* (2015: 4) where about 12% of cases Apgar scores were not recorded at all. According to Bor (2010:21), Moalusi (2011:45) and Jere (2014:39) adverse neonatal outcomes were low Apgar scores and fresh stillbirths. These findings were consistent with the study by Rani and Laxmi (2016:317) where it was revealed that 4.5% had birth asphyxia. Two point five per cent (2.5%) had septicaemia, neonatal jaundice and small for gestational age neonate were seen in 2% cases.

5.2.5 Research objective 5: To determine overall utilisation of partogram in selected health care facilities in Bojanala District

The overall partogram average utilisation in this study was 20% indicating poor utilization. The results of this study are consistent with the study by Jere (2014:33) where it was revealed that there was inadequate use of the partograph by health providers and even though partographs were available in women's files, the partograph data were not completed adequately. Similarly, Khonje (2012:107)

confirmed that the partograph was not optimally used for maximum detection of problems during labour and indicated that this had an implication that problems could have been prevented. It was also revealed that there was poor recording in terms of the clinical notes using the partogram. No partogram that was reviewed for the study was completed according to standard and this indicated poor partogram utilization. This was also confirmed by Mphasha *et al* (2017:1) where it was revealed that doctors and midwives could not use partogram and demonstrated inadequate knowledge and understanding of the partogram on a national audit. According to Azevedo (2013:6) incorrect utilization of the partogram was identified where there was registration of data in a wrong column in relation to lines of alert and action and of evolution in intervals longer than 1 hour per column. This also is an addition to the magnitude of the poor partogram utilization. Poor partogram utilization was also confirmed by Kitila (2014:6) where it was revealed that out of the total 340 reviewed maternal records, partograph was present in 274(80.6%) of the files but only utilized for 19/274 (6.9%) mothers. Low partogram utilization was also confirmed in the study by Wakgari (2015:558).

5.3 SUMMARY

The discussions were based on five objectives of the study where a description of the following partogram parameters were provided: frequency of recording of admission information, the latent phase of labour, the active phase of labour, the second stage of labour and a description of overall utilisation of partogram in selected health care facilities in Bojanala District. The study established that although partograms were available in all the files, the correct utilisation of the partogram for labour monitoring was low with 80% of recordings being substandard and incomplete. This is consistent with the study by Verla, Ojong-Alasia, Sama, Tumasang, Ndipowa and Atanga (2017: 56) where that was evident. The utilisation of the partogram was truncated, and this was related to a shortage of staff and unavailability of the partogram. Contrary to the study by Markos (2017:25), it was revealed that 193 (71.1%) used routinely utilised partogram and 76(28.3%) of participants reported not utilising partogram routinely.

The study found that there were inadequate clinical practices about partogram usage in most labour wards of selected healthcare facilities in Bojanala District of the North-

West Province. Most of the labour parameters had been recorded at least once in the partogram. Out of the 279 partograms analysed, none of them had data completed according to the World Health Organisation standards. The study revealed that although the partogram utilised in Bojanala District is a composite type, which should include recording during the latent phase of labour, the study showed that this was given little clinical value since most women were put onto the partogram at 4cm of cervical dilatation. Furthermore, there was poor utilization of partogram in selected health care facilities of Bojanala District. In the next chapter, limitations, recommendations and a conclusion of this study are discussed.

CHAPTER 6

LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

6.1 INTRODUCTION

This study was cross-sectional, descriptive and evaluated partogram utilisation in selected healthcare facilities of Bojanala District in the North-West Province with strengths and limitations that are presented. Appropriate recommendations were made within the context of the study's findings. The results obtained from this study were assessed in relation to objectives of this study to draw appropriate conclusions.

6.2 STRENGTHS OF THE STUDY

Respondents in this study were plotted partograms making it easier to obtain information, as data were already available in the maternity case records. The researcher collected data within four weeks. The study was conducted at four out of five sub-districts of Bojanala District. The findings can still be generalised to other districts in the North-West Province of South Africa. Although some files that met the inclusion criteria were kept in the manager's office, it was possible to determine the frequency of recordings of information during admission of woman in labour, recordings of parameters during the latent and active phases, recordings during the second stage of labour and overall utilization of the partogram in Bojanala District. This study was carried out successfully and has produced significant results. Despite the strengths that are mentioned, there were some limitations.

6.3 LIMITATIONS OF THE STUDY

The researcher did not do the observation of midwives and other healthcare workers' plotting on the partogram in the real work situation. Reviewing records limited the researcher, if the study had included face-to-face interviews with midwives and other health care workers, more information could have been obtained which did not appear on the partograms. In-depth exploration of challenges experienced by midwives and other health care workers was not carried out. Some records of adverse neonatal and maternal outcomes were not available for review at most clinics as they were allegedly kept in the offices of the managers. Some records were sent with patients to other levels of care. The study consisted of partograms'

review, so some relevant data were missing due to inconsistency and incomplete documentation in the patient s' files.

6.4 RECOMMENDATIONS OF THE STUDY

Numerous recommendations could be drawn from the findings of the study, despite the limitations indicated earlier. Recommendations will be based on the nursing practice, nursing education and future research.

6.4.1 Nursing Practice

- Guidelines on when and how to plot should be displayed in labour rooms of all clinical facilities for all to see so that midwives and other healthcare workers are reminded on partogram utilisation and to be committed to using it.
- There has to be a thorough orientation programme of newly qualified midwives who have just joined the service on partogram utilisation and interpretation.
- Each midwife or accoucher should be allocated a preceptor for at least a month to be supervised on partogram utilisation and interpretation to ensure adequate clinical supervision on partogram utilisation.
- Formulation of audit committees on partogram utilisation should regularly be conducted so that midwives are evaluated continuously on the utilisation of partogram
- There is a need for regular meetings between midwives and doctors of clinical facilities at primary and secondary levels of care on the utilisation of partogram and to share experiences in the utilisation.
- There should be strengthening of maternal or perinatal morbidity and mortality meetings at all levels of care to identify mismanagement of low and high-risk pregnant women in labour and learn from them. These meetings are to be compulsory.
- Regular supportive supervision for maternity staff with emphasis on partogram utilisation and delivery outcomes should be intensified through MOU's, Community Health Centres rendering delivery services, district and provincial hospitals

- Mentorship of midwives, especially of the newly- qualified and less experienced, should be done more vigorously since they pose the risk of incorrect decision making due to lack of experience.
- All clinical facilities to establish a journal club where articles would be studied regarding partogram utilisation and this presented to other members.
- All clinical facilities, especially health centres, should be allocated at least ten midwife specialists as in this study; one health centre under study had one midwife specialist and it was one of the busiest facilities. All midwives at all levels of care rendering maternal and neonatal care are to be trained as midwife specialists (post basic midwifery and neonatal nursing science)
- To implement and consider incorporating the use of the partogram in the continued professional development checklist for midwives.

6.4.2 Nursing Education

- There is a need for regular in-service training of all health professionals including midwifery lecturers on the importance of adequate partogram recording and its interpretation
- Nursing education institutions are to emphasise the importance of using the partogram and interpretation in their midwifery teaching.
- Regular meetings between midwifery lecturers and experts in clinical areas would ensure uniformity in teaching partogram plotting and interpretation to student midwives according to standards set by the World Health Organisation.

6.4.3 Nursing Research

The researcher recommends that further research is conducted as follows:

- The qualitative study should be conducted with the focus on the causes or reasons for inadequate completion of the partogram.
- A prospective study with data collection at all sub-districts should be conducted as this might yield more relevant data with face to face interviews with midwives and other healthcare workers
- Evaluate the use of partogram in other secondary and primary level facilities to establish a pattern of utilisation and plotting which would help, if there is a need

to modify the current composite partogram to suit the local context or to use the modified one without the latent phase of labour.

- Extensive research should be conducted to identify several effective methods of education that would enhance effective and efficient utilisation of the partogram

6.5 CONCLUSION

In conclusion results of the of this study revealed poor partogram utilisation as the average percentage of utilisation was 20%, implying that 80% was not utilised at all or was not utilised according to the set standards. There were poor clinical practices in relation to partogram usage in most labour wards of selected healthcare facilities in Bojanala District of the North-West Province. Out of the 279 partograms analysed, none of them had data completed according to the World Health Organisation standards. This study revealed high proportions of unrecorded parameters on partograms in selected health facilities of Bojanala District, coupled with substandard monitoring of progress of labour that may have played a significant role in the adverse maternal and neonatal health outcomes. Any parameter of the partogram, if not recorded is interpreted as if it were not done because there is no evidence to that effect. It was also found out that midwives were the only ones plotting the partogram and doctors recorded on the progress notes only.

The partogram has been used as a standard for monitoring labour for many years. The main reason for using the partogram in monitoring labour is that it guides in the early identification of problems during labour especially in the first stage of labour, which is essential in maternity care. The correct use of the partogram is an essential procedure in midwifery care and helps in clinical decision making during labour. Proper utilisation could lead to correct decision making which would lead to correct interventions, leading to a reduction in both maternal and neonatal complications. The study revealed that there was inconsistency in plotting where other clinical facilities would plot the latent phase in the partogram and others recording only on the clinical notes. The study also found inconsistency in transferring from the latent phase of labour to the alert line where other facilities would transfer when the woman was 3cm dilated and others transferring to the alert line when the woman was 4cm dilated.

The low or substandard utilisation of the partograms in selected healthcare facilities of Bojanala District of the North-West Province meant that women delivered in those clinical facilities did not receive optimum quality intrapartum care and therefore the complications were not attended to promptly. This has a direct impact on maternal and neonatal morbidity and mortality rate in the whole country. In this study, poor documentation of the partogram parameters found reflects the poor intrapartum care, and this explains the existing high maternal and perinatal mortality in Bojanala District. The hypothesis is therefore accepted as the results indicated that there is poor partogram utilization in Bojanala District

The correct use of the partogram during labour provides evidence of the kind of care that is being provided to women in labour and their response to that care. The results of this study might be useful to midwives, other healthcare professionals, programme managers and policymakers. The reintroduction of partogram utilisation in maternity care should be given priority to midwives and other healthcare workers. Refresher courses on monitoring, recording and interpretation of the partogram could lead to better adherence to the recording of partograms and increase earlier detection of cases of prolonged and obstructed labour. This could lead to achieving SDG 3 by ensuring a reduction in maternal mortality ratio to less than 70 per 100,000 live births and end preventable neonatal mortality by 2030.

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APPENDICES

Appendix 1: Permission Letter to the Northwest Department of Health

11 Bontebok Street
Elandsrand
Brits
30 May 2013

Policy, Planning, Research Monitoring and Evaluation
Northwest Department of Health
Private Bag 2068
MMABATHO
2735

Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I hereby apply to conduct a research study for my Masters of Nursing Science degree at selected healthcare facilities of Bojanala District. I am a student at the North-West University (Mafikeng Campus) for Masters in Nursing. I am currently a Lecturer in Advanced Midwifery and Neonatal Nursing Science at Ga-Rankuwa Nursing College, and I was formerly a Lecturer at Mmabatho College of Nursing for basic Midwifery as well as Advanced Midwifery. I request to research the evaluation of partogram utilisation in maternity care in selected health care facilities in Bojanala District of the North-West Province. The elements under investigation are plotted partograms of all deliveries from selected healthcare facilities in Bojanala District within the past twenty-four (24) months of data collection. The dignity and privacy of the research participants being selected health care facilities will be respected and protected by upholding the rights and confidentiality, anonymity, informed consent and their right to withdraw from the study at any time. All the records to be used in this study will not have any personal information (example names and addresses) linked to participants.

The study has been approved by Ethics Committee of the North-West University (Mafikeng Campus) A copy of the proposal is attached. My supervisors are Professor Ushotaneke Useh and Mr Molekodi Matsipane who can be contacted at 082 844 8620 and 083 511 1352 respectively. I am available to answer any questions you might have and can be contacted on 083 7477 963 / 082 511 2137. My Email address is merciamabasa5@gmail.com

Thank you in anticipation

Suzan Kgomoetso Mercia Mabasa

Appendix 2: North-West Department of Health Approval



health

Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

2nd Floor Tirelo Building
Dr. Albert Luthuli Drive
Mafikeng, 2745
Private Bag X2068
MMABATHO, 2735

Tel: (018) 387 1786
kshogwe@nwog.gov.za
www.nwhealth.gov.za

POLICY, PLANNING, RESEARCH, MONITORING AND EVALUATION

To : Ms S.K.M Mabasa
From : Policy, Planning, Research, Monitoring & Evaluation
Subject : Approval Letter-Evaluation of patogram utilization in maternity care in selected health care facilities in Bojanala District

Purpose

To inform the researcher that permission to undertake the above mentioned study has been granted by the North West Department of Health. The researcher is expected to issue this letter to the districts or health facilities as proof that the Department has granted approval of the study. This is on condition that the normal operations at identified facilities are not affected and that there is an appropriate logic in place to ensure that specimen is collected with ease.

Arrangements in advance with managers at district level or facilities shall be facilitated by the researcher. The department expects to receive the final research report upon completion.

Kindest regards


Acting Director: PPRM&E
Mr. L. Moaisi

27/06/2013
Date



Healthy Living for All

Appendix 3: Northwest University Ethics Approval



Private Bag X8001, Potchefstroom
South Africa 2520

Tel: (018) 299-4900
Faks: (018) 299-4910
Web: <http://www.nwu.ac.za>

ETHICS APPROVAL OF PROJECT

Ethics Committee
Tel +27 18 299 4850
Fax +27 18 293 5329
Email Ethics@nwu.ac.za
2013/05/27

This is to certify that the next project was approved by the NWU Ethics Committee:

Project title.
Evaluation of partogram utilization in maternity care in selected health care facility in Bajanala district

Project leader: Prof U Useh
Student on project: SKM Mabasa
NWU Ethics approval no: NWU-00053-13-A9

The Ethics Committee would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the Ethics Committee for any further enquiries or requests for assistance.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Me. Marietjie Halgryn', written over a set of horizontal lines.

Me. Marietjie Halgryn
NWU Ethics Secretariate

Appendix 4: Data Collection Partogram Checklist

PARTOGRAPH/PARTOGRAM CHECKLIST

- Tick where applicable
- Checklist number:-----

PATIENT'S NAME:		PELVIC ASSESSMENT:				DURATION OF LABOUR ON ADMISSION:			
PARITY:	GRAVIDA:	DURATION OF RUPTURE OF MEMBRANES:				RISK FACTORS:			
PARAMETERS		LATENT PHASE				ACTIVE PHASE			
		Recorded	Not Recorded	Not applicable	Intervention	Recorded	Not Recorded	Not Applicable	Intervention
INITIAL ASSESSMENT									
FOETAL CONDITION	Foetal heart rate Baseline								
	Decelerations								
	Liquor								
	Caput								
	Moulding								
PROGRESS OF LABOUR	Cervical dilatation and effacement								
	Cervical length								
	Station								
	Head above the brim								
	Position								
CONTRACTIONS	>40								

IN 10 MINUTES	>20-40								
	<20								
MATERNAL CONDITION	BP & pulse								
	Temperature								
	Urinalysis								
	Management								
PARAMETERS		LATENT PHASE				ACTIVE PHASE			
		Recorded	Not Recorded	Not applicable	Intervention	Recorded	Not Recorded	Not Applicable	Intervention
SUBSEQUENT ASSESSMENT									
FOETAL CONDITION	Foetal heart rate Baseline								
	Decelerations								
	Liquor								
	Caput								
	Moulding								
PROGRESS OF LABOUR	Cervical dilatation and effacement								
	Cervical length								
	Station								
	Head above the brim								
	Position								
CONTRACTIONS	>40								

IN 10 MINUTES	>20-40								
	<20								
MATERNAL CONDITION	BP & pulse								
	Temperature								
	Urinalysis								
	Management								
PROGRESS OF LABOUR	SECOND STAGE OF LABOUR		MODE OF DELIVERY			MATERNAL OUTCOME		NEONATAL OUTCOME	
	Recorded	Not Recorded	Spontaneous Vaginal delivery	Assisted vaginal delivery	Caesarean section	Good	Adverse	Good	Adverse

Recorded = 1

Not Recorded/incomplete recording =0

The Number of recorded items/The total number of items = Score obtained.

Poor recording = from a score of 60 %

Good recording = from a score of 70

Appendix 5: Permission Letter to Swartruggens/Koster Complex

11 Bontebok Street
Elandsrand
Brits
0250
28 June 2013

The Chief Executive Officer
Swartruggens/Koster Hospital
Private Bag x1002
Swartruggens
2835

Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I hereby apply to conduct a research study for my Masters of Nursing Science degree at selected units under your management, specifically Labour and postnatal wards.

I am a student at the North-West University (Mafikeng Campus) and currently a Lecturer for Post Basic Midwifery and Neonatal Nursing Science at Ga-Rankuwa Nursing College.

The elements under investigation are plotted partograms of all deliveries from selected healthcare facilities in Bojanala District within the past twenty-four (24) months of data collection. The dignity and privacy of the research participants being selected health care facilities will be respected and protected by upholding the rights and confidentiality, anonymity and informed consent. All the records to be used in this study will not have any personal information (example names and addresses) linked to participants.

The study has been approved by Ethics Committee of the North-West University (Mafikeng Campus) as well as the North-West Department of Health (Policy, Planning, Research, Monitoring and Evaluation). I have attached the approval from the indicated directorate.

Thanks

Contact: (083 7477 963 / 082 511 2137) Email:merciamabasa5@gmail.com

Yours faithfully
Mrs SKM Mabasa

Appendix 6: Permission from Swartruggens/Koster Complex



health

Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

Cnr. Lindleyport & Nelson
Mandela Road
PiBag X1002
Swartruggens
2835

Enq: Ms. P. Rampa
Tel: (014) 544 0751
Fax: (014) 544 0787
kletsalo@nwpg.gov.za
prampa@nwpg.gov.za

KOSTER/SWARTRUGGENS HOSPITAL COMPLEX – OFFICE OF THE CEO

To: Ms. M. Mabasa

From: Mr. JK Letsoalo
CEO: K/S Hospital Complex

Date: 04 July 2013

Subject: Request to undertake study: yourself

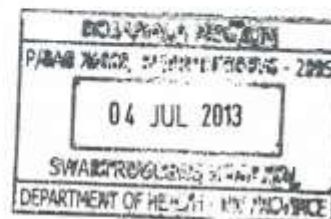
Reference is here made to your correspondence to our institution regarding the above-mentioned subject.

The purpose of the communiqué is to inform you that approval is granted for you to perform your research within the hospital complex. Please take note that you will however be expected to produce this letter every time you come to the hospital for this purpose. You will also be expected to liaise with the operational manager at maternity unit for them to assist you with the relevant documents.

We wish you the best in your endeavor.

Kind regards

Mr. JK Letsoalo
CEO: K/S Hospital Complex



K/S Hospital Complex Quality care close to home!

Appendix 7: Permission to Madibeng Subdistrict

11 Bontebok Street
Elandsrand
Brits
0250
28 June 2013

The Subdistrict Manager
Madibeng Subdistrict
Brits
0250

Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I hereby apply to conduct a research study for my Masters of Nursing Science degree at selected healthcare facilities under your management, which are Oukasie Maternity Unit, Letlhabile Health Centre and Bapong Health Centre.

I am a student at the North-West University (Mafikeng Campus) and currently a Lecturer for Post Basic Midwifery and Neonatal Nursing Science at Ga-Rankuwa Nursing College.

The elements under investigation are plotted partograms of all deliveries from selected healthcare facilities in Bojanala District within the past twenty-four (24) months of data collection. The dignity and privacy of the research participants being selected health care facilities will be respected and protected by upholding the rights and confidentiality, anonymity and informed consent. All the records to be used in this study will not have any personal information (example names and addresses) linked to participants.

The study has been approved by Ethics Committee of the North-West University (Mafikeng Campus) as well as the North-West Department of Health (Policy, Planning, Research, Monitoring and Evaluation). I have attached the approval letter from the indicated directorate.

Thanks

Contact: (083 7477 963 / 082 511 2137) Email:merciamabasa5@gmail.com

Yours faithfully
Mrs SKM Mabasa

Appendix 8: Permission from Madibeng Sub-district



health

Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

Private Bag x5084
Brits
Madibeng
0250

Tel: (012)2522355
Fax: (012)252 3460
imoloi@nwpq.gov.za
kmaponyane@nwpq.gov.za

MADIBENG SUB-DISTRICT

07 July 2013

To: Facility Manager

From: Mr. IM Moloi
Sub-district Manager

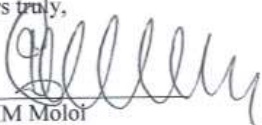
Re: Permission to collect data at facility

This serves to inform you that the Sub-district Manager's office has granted permission to Ms. K. Mabasa to collect data at the facility for research purposes.

For clarity please contact the manager's office.

Hope you find the above in order.

Yours truly,


Mr. IM Moloi
Sub-district Manager



Healthy Living for All

Appendix 9: Permission to Job Shimankana Provincial Hospital

11 Bontebok Street
Elandsrand
Brits
0250
28 June 2013

The Chief Executive Officer
Job Shimankana Tabane Hospital
Rustenburg
0300

Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I hereby apply to conduct a research study for my Masters of Nursing Science degree at selected units under your management, specifically Labour and postnatal wards.

I am a student at the North-West University (Mafikeng Campus) and currently a Lecturer for Post Basic Midwifery and Neonatal Nursing Science at Ga-Rankuwa Nursing College.

The elements under investigation are plotted partograms of all deliveries from selected healthcare facilities in Bojanala District within the past twenty-four (24) months of data collection. The dignity and privacy of the research participants being selected health care facilities will be respected and protected by upholding the rights and confidentiality, anonymity and informed consent. All the records to be used in this study will not have any personal information (example names and addresses) linked to participants.

The study has been approved by Ethics Committee of the North-West University (Mafikeng Campus) as well as the North-West Department of Health (Policy, Planning, Research, Monitoring and Evaluation). I have attached the approval letter from the indicated directorate.

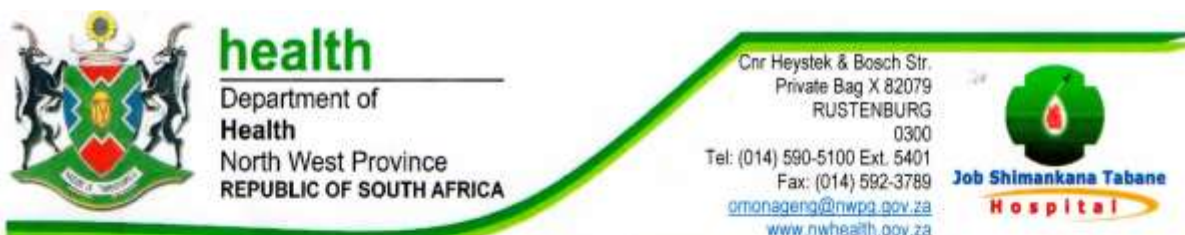
Thanks

Contact: (083 7477 963 / 082 511 2137) Email:merciamabasa5@gmail.com

Yours faithfully

Mrs SKM Mabasa

Appendix 10: Permission from Job Shimankana Provincial Hospital



JST HOSPITAL: OFFICE OF THE CHIEF EXECUTIVE OFFICER

To: Ms. SKM Mabasa

From: Mrs. M.R. Mokoto
CEO-JST Hospital

Date: 07 July 2013

Subject: Permission to collect data

This letter serves as permission to grant Ms. SKM Mabasa approval to collect data at JST Hospital as per attached request.

Kind Regards



Mrs. M.R. Mokoto
CEO-JST Hospital

Appendix 11: Permission to Rustenburg Sub-district

11 Bontebok Street
Elandsrand
Brits
0250
28 June 2013

The Sub-District Manager
Rustenburg Sub-district
Rustenburg
0300

Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I hereby apply to conduct a research study for my Masters of Nursing Science degree at selected healthcare facilities under your management, specifically Boitekong health and Tlhabane health centres.

I am a student at the North-West University (Mafikeng Campus) and currently a Lecturer for Post Basic Midwifery and Neonatal Nursing Science at Ga-Rankuwa Nursing College.

The elements under investigation are plotted partograms of all deliveries from selected healthcare facilities in Bojanala District within the past twenty-four (24) months of data collection. The dignity and privacy of the research participants being selected health care facilities will be respected and protected by upholding the rights and confidentiality, anonymity and informed consent. All the records to be used in this study will not have any personal information (example names and addresses) linked to participants.

The study has been approved by Ethics Committee of the North-West University (Mafikeng Campus) as well as the North-West Department of Health (Policy, Planning, Research, Monitoring and Evaluation). I have attached the approval letter from the indicated directorate.

Thanks

Contact: (083 7477 963 / 082 511 2137) Email:merciamabasa5@gmail.com

Yours faithfully
Mrs SKM Mabasa

Appendix 12: Permission from Rustenburg Sub-district

	health Department of Health North West Province REPUBLIC OF SOUTH AFRICA	125 Kerk Street Private Bag X82055 RUSTENBURG 0300	Tel: (014) 594 8311 Fax: (014) 592 3199 ysemake@nwp.gov.za
---	--	---	--

RUSTENBURG SUB-DISTRICT: HUMAN RESOURCE DEVELOPMENT

To: Ms S.K.M Mabasa

From: Mr L.K Tlhowe
Rustenburg Sub- District Mnager

Subject: Approval Letter: Evaluation of patogram utilization in maternity care in our health care facilities: Boitekong and Tlhabane Health Centres

This correspondence serves to inform you that permission to undertake the above mentioned study has been granted by Rustenburg Sub District Manager.

The researcher is expected to issue this letter to the health facilities as proof that the Sub District has granted approval of the study.

This is on condition that the normal operations at the identified facilities are not affected and that there is an appropriate processes and procedures in place to ensure easy collection of data.

Arrangement in advance with managers at facilities shall be facilitated by the researcher. The Sub District Office expects to receive copy of the final research report upon completion.

Kind regards


Mr L.K Tlhowe
Rustenburg Sub- District Manager

2013/07/19
Date


Healthy Living for All

Appendix 13: Permission to Moses Kotane District Hospital

11 Bontebok Street
Elandsrand
Brits
0250
28 June 2013

The Chief Executive Officer
Moses Kotane Hospital
Private Bag X2
Sun City
0316

Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I hereby apply to conduct a research study for my Masters of Nursing Science degree at selected units under your management, specifically Labour and postnatal wards.

I am a student at the North-West University (Mafikeng Campus) and currently a Lecturer for Post Basic Midwifery and Neonatal Nursing Science at Ga-Rankuwa Nursing College.

The elements under investigation are plotted partograms of all deliveries from selected healthcare facilities in Bojanala District within the past twenty-four (24) months of data collection. The dignity and privacy of the research participants being selected health care facilities will be respected and protected by upholding the rights and confidentiality, anonymity and informed consent. All the records to be used in this study will not have any personal information (example names and addresses) linked to participants.

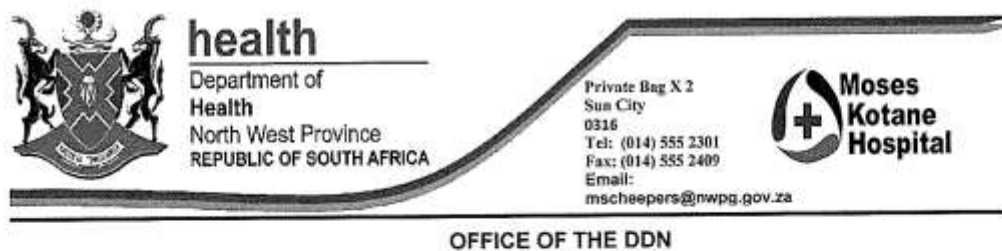
The study has been approved by Ethics Committee of the North-West University (Mafikeng Campus) as well as the North-West Department of Health (Policy, Planning, Research, Monitoring and Evaluation). I have attached the approval from the indicated directorate.

Thanks

Contact: (083 7477 963 / 082 511 2137) Email:merciamabasa5@gmail.com

Yours faithfully
Mrs SKM Mabasa

Appendix 14: Permission from Moses Kotane District Hospital



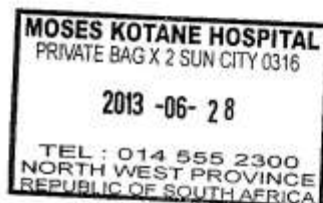
To: Ms. S.K.M Mabasa
From: Ms M. E Scheepers
Date: 28 June 2013

Subject: Approval for Evaluation of patogram utilization in maternity care in Moses Kotane Hospital

This communique services to inform you that the above mentioned candidate have being granted permission to undertake Evaluation of Patogram Utilization in Maternity Care of Moses Kotane Hospital.

Yours in health

PP 
Ms M.E Scheepers
Approved/Not Approved



Appendix 15: Declaration from the Editor

ZENEDIT

Professional Services

5 Gwai Place; 10 Kudu Heights
Faerie Glen
Pretoria
0081

Email: pholilemaseko@yahoo.com
Cell: 076 103 4817

15 January 2018

DECLARATION OF PROFESSIONAL EDIT

I declare that I have edited and proofread the Master of Curationis Dissertation entitled: **EVALUATION OF PARTOGRAM UTILISATION IN MATERNITY CARE IN SELECTED HEALTH CARE FACILITIES OF BOJANALA DISTRICT** by Ms Suzan Kgomoetso Mercia Mabasa.

My involvement was restricted to language editing, proofreading, sentence structure, sentence completeness, sentence rewriting, consistency, referencing style, editing of headings and captions. I did not do structural re-writing of the content. Kindly note that the manuscript was not formatted as per agreement with the client. No responsibility is taken for any occurrences of plagiarism, which may not be obvious to the editor. The client is responsible for the quality and accuracy of the final submission.

Sincerely,



Pholile Zengele

Associate Member, Professional Editors Group

Professional
EDITORS 
Group