FACTORS ASSOCIATED WITH FRESH STILLBIRTHS IN LIVINGSTONE DISTRICT, ZAMBIA

By

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A Dissertation submitted to the University of Zambia in partial fulfilment of the requirements for the award of the Degree of Master of Science in Midwifery and Women's Health

THE UNIVERSITY OF ZAMBIA

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I, Dr C.N. Kwaleyela, having supervised and read through this dissertation, is satisfied that this is the original work of the author under whose name is presented. I also confirm that the work has been completed satisfactorily and approve this dissertation for final submission.

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The University of Zambia approves this dissertation by Ruth Zulu on "Factors Associated with Fresh Stillbirths in Livingstone District, Zambia" in partial fulfilment for the requirements for the award of Master of Science in Midwifery and Women's Health.

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DEDICATION

To the merciful souls of the silent babies at birth and the great women who endured the pain and grief of their loss.

To dad (Timothy Zulu) for moulding me into what I am today.

To mum (Esther Banda Zulu) for her constant prayers and encouragement.

To husband (Paul Nambala) for his love and support during my studies.

To Sister Susan and Brother Andrew for taking care of me during my studies and for their support and encouragement.

To brother (Simon) for taking care of the boys during my absence.

To my sons Alex and Nyamiya for taking care of your young brother Choolwe Paul Jr.

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ABSTRACT

Introduction: Over a million fresh stillbirths occur every year, and they are attributed to acute intrapartum events. Good, timely and appropriate midwifery care provided by skilled attendants in an environment that is favourable prevents or at least decreases the incidence of fresh stillbirths. The aim of this study was to determine factors associated with fresh stillbirths in Livingstone district, Zambia. **Methods:** This was a descriptive cross sectional study in which a checklist was used to collect data from files of 245 women who had birthed at Livingstone Central hospital, and a semi-structured self administered questionnaire adapted from the World Health Organisation (WHO) was used to collect data from 35 midwives from Livingstone Central Hospital and three clinics in the district. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 23. Relationships between variables were ascertained using Chi-square and Fisher's Exact tests. Multivariate logistic regression was used to control for confounding variables and to come up with an independent contributing factor for fresh stillbirths. To ascertain the significance of a result, 95% Confidence Intervals and 5% level of significance was used. **Results:** The findings revealed that foetal and maternal related complications were associated with fresh stillbirths in the district. The association between maternal complications and fresh stillbirths was statistically significant with a p-value of 0.013; while that between foetal complication and fresh stillbirth was 0.001. Regarding knowledge, 71.4% of midwives had low knowledge levels on fresh stillbirths, while 80% reported not having received in-house training on emergency management of maternal and neonatal emergencies. Foetal related factors associated with fresh stillbirths were cord accidents (p-value 0.040) and prematurity (p-value 0.003). Additionally, mothers whose occupation was trading had 5.5 more times Odds of having fresh stillbirths, with p value of 0.021. **Conclusion**: The conclusion of the study is that it is important to ensure that quality antenatal and intrapartum care are provided to all women, in particular those in the occupation of trading, to ensure timely diagnosis and appropriate management of maternal and foetal complications. There is also need to conduct in-house training for midwives in the diagnosis and management of maternal and foetal complications.

Key words – Fresh stillbirths, antenatal, intrapartum care

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LIST OF ABBREVIATIONS

ANC……………………….......Antenatal Care

BEmONC.....................................Basic Emergency Obstetric and Neonatal Care

EmONC......................................Emergency obstetric and neonatal care

HBB...Help baby breath

HIMS...Health Information Management System

LMIC...Lower Medium Income Countries

LDHO..Livingstone District Health Office

LPHO...Livingstone Provincial Health Office

MCH……………………….....Maternal Child Health

MoH…………………………....Ministry of Health

NMCZ.......................................Nursing and Midwifery Council of Zambia

SDGs…………………………...Sustainable Development Goals

SMAGs......................................Safe Motherhood Action Groups

SPSS………………………….....Statistical Package for Social Scientist

TSS...Technical Support and Supervision

UNICEF………………………..United Nations Children Emergency Fund

UNZABREC……………………..University of Zambia Biomedical Research Ethics Committee

WHO…………………………...World Health Organisation

CHAPTER ONE: INTRODUCTION

1.0 Introduction

According to the WHO (2019), maternal and newborn care is the major focus of discussion in perinatal care, but little attention is paid to fresh stillbirths. Thus, in the face of some progress in the areas of advocacy, policy formulation, monitoring, and research, substantial gaps remain in the data that is needed to track effective coverage of proven interventions for perinatal survival, and hence hampering accountability. There is little impetus to include stillbirths in policies and programmes for the Sustainable Development Goals (SDGs) because stillbirth rate reduction is not a target in these goals (Lawn et al., 2016). However, stillbirth has always been a devastating experience for the mother and of concern in clinical practice.

A stillbirth is a baby born after the 28th week gestation of pregnancy and has not at any time after being completely expelled breathed or shown any sign of life (Fraser and Cooper, 2012). A stillbirth can happen either during intrapartum (fresh stillbirth) or antepartum (macerated stillbirth). For fresh stillbirths, the death-to-delivery period is short with the death having taken place during labour and delivery, whereas macerated stillbirths are conversely supposed to have occurred before labour: the death-to delivery interval is longer. In macerated stillbirths, the foetus show skin and soft tissue changes (skin discolouration or darkening, redness, peeling, and breakdown); all of which are absent in fresh stillbirths (Gold, 2014). This study aims at identifying factors that are associated with fresh stillbirth in Livingstone, Zambia. The chapter presents the background information, statement of the problem, justification of the study, research objectives, research hypothesis, the conceptual framework upon which the study was be based on, conceptual and operational definitions, and variables.

1.1 Background

Every year, 2.7 million stillbirths are recorded worldwide (Froen, 2011). Ninety-eight percent of these stillbirths occur in low and middle income countries (LMIC), and half of these happen in the sub-Saharan Africa; resulting in a ten-fold disparity in stillbirth rates between high and LMIC (Lawn et al., 2011). One million or more stillbirths occur in the intrapartum period and are preventable with good obstetric care (Lawn et al., 2011).

The period surrounding labour and delivery represents the time of highest risk when 45% of all stillbirths take place (Gold, 2014). Fresh stillbirths are thought to be more preventable as they occur during labour, mainly in term pregnancies and generally without foetal abnormalities (Chigbu et al., 2009). According to Lawn et al., (2011), 25-67% of fresh stillbirths are largely due to preventable complications such as prolonged labour. The WHO (2015) also reports that complications arising during labour and delivery are the main causes of deaths among nearly all infants who were alive while labour started, but were born dead. The unacceptable number of fresh stillbirths globally might be understood as a mutual underpinning between neglect during intrapartum care, lack of information and failure to apply evidence-based obstetric care practices (WHO, 2015). When women receive appropriate care during childbirth, fresh stillbirth rate reduces to 3-6 per 1000 and only due to unexpected severe complications (WHO, 2015).

Recognising the gaps in the care provided to women in labour is critical in identifying appropriate interventions to reduce fresh stillbirths. If improvement in the quality of intrapartum care and effective emergency obstetric interventions are implemented at the facility level, a number of fresh stillbirths could be prevented. Complications such as cord prolapse, intrapartum asphyxia including foetal distress and obstructed labour would not lead to fresh stillbirths if discovered early and properly managed (Froen, 2011).

According to Ministry of Health (MoH, 2019), Zambia has promoted measures to prevent stillbirths which include; coverage of comprehensive obstetric care, where operative measures for complicated deliveries are being introduced. This is the care given to pregnant women who have developed complications that need surgical interventions to save their lives. A training policy to sponsor and train midwives in Maternal and Child Health (MCH) care so that every woman could have access to skilled birth attendant personnel had been put in place with a view to prevent complications that may lead to fresh stillbirth. Following these trainings, it was expected that midwives and doctors would to be able to use the partograph correctly in identifying risk factors promptly and instituting timely interventions and subsequently reducing the numbers of fresh stillbirth. Easy to implement and available interventions, such as use of a partograph for all labouring women and improving the referral system, have the potential to save the lives of many foetuses (Millogo et al., 2016).

The partograph is a useful graphical documentation of the course of labour that capitulate optimal results when used in labour management by healthcare providers (Asibong et al., 2014). When used appropriately, it aids in continuity of care, facilitates the early recognition of abnormalities, and assists in early decision in the transfer, augmentation, or termination of labour. However, in a clinical audit conducted by Kasengele et al., (2017) in Mansa, only 31.3% of women in labour were monitored using a partograph; and in the same study, only 16% of women in labour had the foetal heartbeat monitored every 30 minutes. These gaps in care led to missing the onset of complications such as foetal distress that could have eventually led to fresh stillbirths. In Livingstone district, health centres provide Basic Emergency Obstetric and Neonatal Care (BEmONC) and are first contact points for intrapartum care; while Livingstone Central Hospital provides more specialised and comprehensive obstetric services mostly based on referrals from facilities. The district has distributed the Zambia National Maternal and Neonatal Services referral guidelines which were developed in 2018 to all the health facilities in order to standardise referral practices. These guidelines supply healthcare providers with concise guidance on which patient conditions to refer, when to refer, required pre-referral care and a standard referrals format for documenting referrals and feedback information (MoH, 2019).

However, the high numbers of fresh stillbirths at Livingstone Central Hospital could have been compounded by competence and confidence gaps to monitor women in labour, make correct diagnosis, and provide prompt attention by healthcare providers in the other delivery centres of the district. Ultimately, this gap may have led to delay in referring women with complications such that by the time a woman arrived at the hospital, it would be too late to institute measures to save the foetus: thereby, contributing to high numbers of fresh stillbirths in Livingstone district. Without concrete information as to why there is a rise in the number of fresh stillbirths in the district; this study was found worthwhile to conduct.

1.2 Statement of the Problem

There should be very few or no incidences of fresh stillbirths if midwives and other health professionals follow the Zambia National Maternal and Neonatal Service Guidelines when caring for pregnant women during labour and delivery. However, in the case of Livingstone Central Hospital, which is the district's referral hospital, Table 1 shows a 0.8% increase in the number of fresh stillbirths from 2017 to 2019. The statistics do not however, illustrate the factors associated with the fresh stillbirth; hence, this study was conducted.

Table 1: Fresh Stillbirths at Livingstone Central Hospital

Year	Total number of deliveries	Total number of fresh Stillbirths	Proportion/1000
2017	1592	26 (1.6%)	16/1000
2018	2333	40 (1.7%)	17/1000
2019	2306	56 (2.4%)	24/1000

Source: Livingstone Central Hospital HIMS (2017-2019).

1.3 Justification of the Study

Annually, there are 1.2 million fresh stillbirths worldwide and 98% of these are in the sub-Saharan Africa (Lawn et al., 2011). Even though stillbirths represent a large proportion of perinatal deaths, factors contributing to stillbirths differ from one location to the other. This is the reason that this study was conducted in Livingstone district. The results of this study whose data was collected from midwives in Livingstone district and files from women who birthed at Livingstone Central Hospital; being both a provincial and district referral hospital have highlighted that factors associated with fresh stillbirths in the district can be divided in two main categories, namely; maternal and foetal complications. This information can thus assist stakeholders, who include healthcare professionals, in particular, midwives, put in place evidence-based interventions that target improvement in the provision of antenatal and intrapartum care in the district in order to improve birth outcomes, especially for infants.

1.4 Research Question

What factors are associated with incidences of fresh stillbirths in Livingstone district of Zambia?

1.5 Research Objectives

1.5.1 General Objective

The general objective of this study was to determine factors associated with incidences of fresh stillbirths in Livingstone district of Zambia.

1.5.2 Specific Objectives

The specific objectives of this study were to:

1. Assess midwives in Livingstone district's knowledge of factors associated with fresh stillbirths.
2. Appraise midwives in Livingstone district's skills in the provision of EmONC and HBB services.
3. Identify maternal and foetal factors associated with incidences of fresh stillbirths in Livingstone district, Zambia.

1.6 Conceptual Framework

The conceptual framework that guided the conducting of this study was the Donabedian model (Figure 1). This model is described by Ghaffari et al, (2014) as the most comprehensive model for healthcare assessment. The model was presented in 1966, and defined three distinct aspects of quality; structure, process and outcome (Gardner et al., 2014). It describes a holistic approach in assessing quality of care. Structure outlines the attributes of the setting (physical structure, equipment, surgical, medical supplies, and staff characteristics) in which care is offered (Gardner et al., 2014). Process describes the giving and receiving of care, while outcome denotes the effects of care on the health status of individuals and populations. This applied framework was used in this study because it described all the important components and elements of the healthcare delivery system.

Figure 1: Donabedian Quality of Care Framework

Structure	Process	outcome
Physical and organizational characteristics where health care occurs	What is actually done in giving and receiving care e.g. services, diagnostics or treatments	Effects of health care on the status of patients and populations
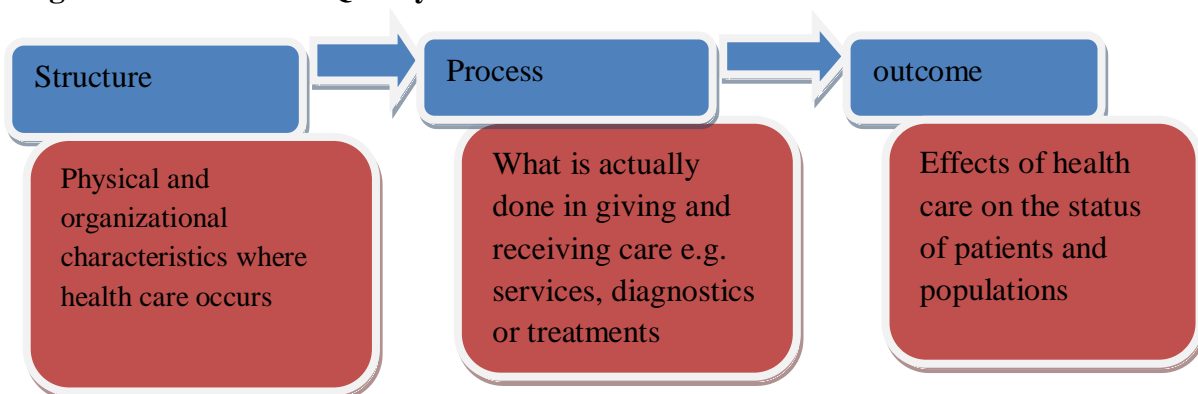
Source: *Ghaffari et al., (2014) from the Donabedian quality of care framework (1980)*

1.6.1 Application of the model to the study

The Donabedian Theoretical model was modified to suit the study. For instance, the structure in this study was the labour room, which should have had all the necessary equipment for labour monitoring to prevent fresh stillbirths. Process described the provision of antenatal and intrapartum care to women using prescribed tools such as the partograph; while outcome denoted the end product of the care that was provided. In this study the outcome was the status of the newborn, which included; fresh stillbirth macerated stillbirth or a live birth. According to Gardner et al., (2014), structure and process may influences outcome either directly or indirectly. This correlated well with this study because the suitability of the structure; in this case, the labour room and the process, which was the management of women antenatally and during labour and delivery influenced the outcome. A diagrammatic illustration of the application of the model is shown in Figure 2.

Figure 2: Adapted Donabedian quality of care framework
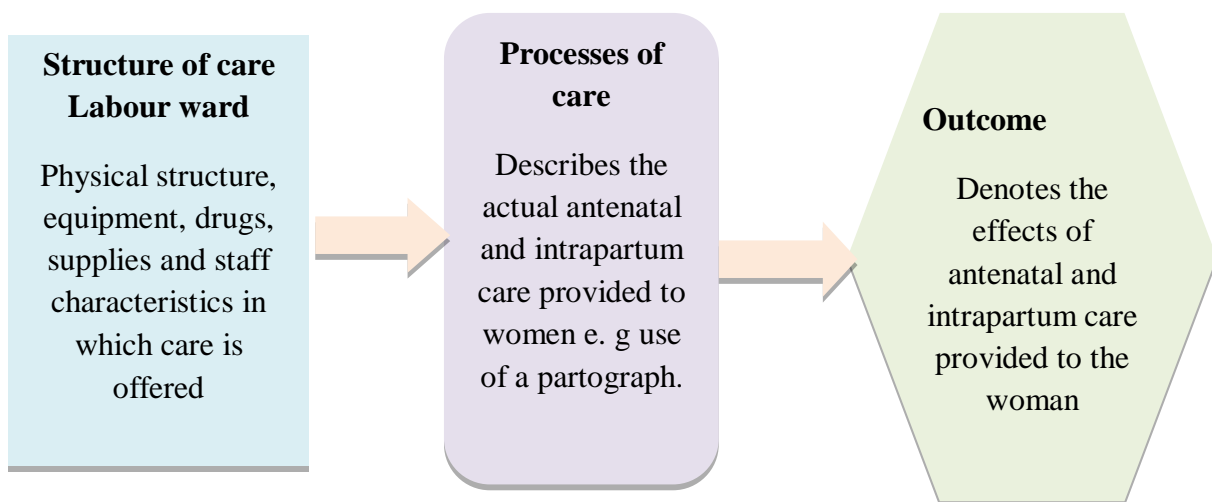
1.7 Variables

1.7.1 Dependent Variable

The dependent variable for the study was fresh stillbirths.

1.7.2 Independent Variables

The independent variables were:

1. Knowledge.
2. Skills.

3. Obstetric and medical conditions.

4. Foetal conditions.

Table 2: Variables, indicators and Cut off Point

Variable	Indicator	Cut Off Point	Question Number
INDEPENDENT VARIABLES			
Service Related Factors			
Knowledge	High	Score of 80% and above on knowledge questions	4-20
	Medium	Score of 79-70% on knowledge questions	
	Low	Score below 70% on knowledge questions	
Skills	Proficient	Score of 80% and above in EmONC and HBB skills	17-38
	Not proficient	Score of less than 80% in EmONC and HBB skills	
Obstetric or Medical condition	Present	Presence of an obstetric or medical condition in mother	7-12
	Absent	Absence of an obstetric or medical condition in mother	
Foetal condition	Present	Presence of foetal condition that predisposes to fresh stillbirth	13-16
	Absent	Absence of foetal condition that predisposes to fresh stillbirth	
DEPENDENT VARIABLE			
Fresh stillbirth	Yes	Baby born with no signs of life	28
	No	Live birth/macerated stillbirth	

1.8 Conceptual Definition of Terms

Stillbirth: A baby born after the 28th week gestation of pregnancy and has not at any time after being completely expelled from its mother, breathed or shown any sign of life (Fraser and Cooper, 2012).

Fresh Stillbirth: A foetus born after 28 weeks of gestation, or with a birth weight more than 1000 g, who had detectable foetal heart sounds upon admission, but died during the intrapartum period, and therefore had an Apgar score of 0 at 1 and 5 minutes, without signs of maceration (Tavares Da Silva, 2016).

Knowledge refers to a fund of information that enables an individual to have adequate understanding of a subject with the ability to use it for a specific purpose (Barger et al., 2019).

Service related factors: These are health care concerns that play a role in determining the quality of outcome during and after delivery (WHO, 2015).

1.9 Operational Definition of Terms

Stillbirth: A baby born after the 28th week gestation of pregnancy without any sign of life.

Fresh Stillbirth: Baby born after 28 weeks of gestation with intact skin and no signs of maceration.

Knowledge: This is acquisition of facts, truths or principles about management of women during labour and delivery during training or working as a midwife.

Spontaneous vaginal delivery: Normal vertex delivery without use of drugs or techniques to deliver the baby.

Service related factors: Facility related issues that could compromise provision of antenatal and intrapartum care leading to fresh stillbirths.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter presents reviewed literature related to factors that are association to fresh stillbirths. The literature review was presented according to study variables which included knowledge and skill of midwives in managing complications related to fresh stillbirths; maternal and foetal related factors. The rationale of this literature review was to capture the diverse viewpoints around stillbirth in general and fresh stillbirth in particular, to establish a better understanding and to facilitate intellectual arguments on its basic factors, and possible interventions to tackle the issue. In particular, this literature review serves as a cornerstone in informing the conduct of the study on "factors associated with fresh stillbirths in Livingstone, Zambia". The source of this literature included published articles from computerized databases such as Google Scholar and PubMed, including WHO publications, MoH publications and some midwifery textbooks. The major search terms included stillbirths, fresh stillbirth, intrapartum care, as well as availability of resources in maternity wards for provision of quality care. The focus of literature review in this study was on factors associated with fresh stillbirths. The literature is presented under the following headings: Overview of stillbirths, knowledge of health providers, care of women in labour using a partograph, socio-economic, cultural, maternal and foetal factors associated with fresh stillbirths.

2.1 Overview of stillbirths

Cut off points for the gestational age for stillbirths vary from country to country and ranges from 22-28 weeks (Lawn et al., 2010). LMIC, account for 98% of the approximately 2.7 million stillbirths that occur globally, every year (Froen, 2011). While most high income countries have stillbirth rates as low as 3-5 per 1000 births, most LMIC have rates that are approximately ten times higher (Froen, 2011). Most stillbirths are preventable, as evidenced by the low stillbirth rate for high income countries of approximately 3 per 1000 births as compared to 28 per 1000 births in sub-Saharan Africa (Lawn et al., 2011). The greatest risk for the mother and baby is noted during the intrapartum period. Fresh stillbirth is, therefore, a health indicator that measures the quality of obstetric care offered in the labour ward.

Good, timely and appropriate obstetric care provided by skilled attendants in an environment that is favourable prevents or at least decreases the incidence of fresh stillbirths (McClure et al., 2015). Reductions in the stillbirth rates in developed countries are mainly attributed to improved access to quality essential services that include; timely appropriate interventions, sufficient numbers of skilled health personnel and other resources needed to provide quality intrapartum care (McClure et al., 2015).

In a global study conducted by WHO (2015), which included 52 countries; it was estimated that over a million stillbirths are attributed to acute intrapartum events, accounting for a quarter of all neonatal deaths. These deaths occurring immediately around the time of birth are largely invisible in terms of either safe motherhood or child survival programmes. Half of stillbirths occur in the intrapartum period, and 45% occur during the third trimester. Of these, only 14% occur in developed countries (McClure et al., 2015). It was noted that improving health systems around the time of birth potentially offers a triple benefit: reducing not only the neonatal mortality and fresh stillbirths but also averting many of the estimated half a million maternal deaths that occur yearly (WHO, 2015). Though the stillbirth rates have declined world-wide by 19.4% between 2000 and 2015; representing a yearly reduction rate of 2%, the estimated trend lags behind the progress in under five mortality rate, which is now 3.9%, and the maternal mortality ratio, which is at 3.0% for the same period (WHO, 2018).

Regionally, the sub-Saharan Africa region has a stillbirth rate that is ten times that of the developed countries (29 versus 3 per 1000) (Lawn et al., 2016). This is an estimation of the figures, as only 61% of the countries have national data on stillbirth rates in the sub-Saharan region (Blencowe et al., 2016). More than 98% of stillbirths occur in LMIC and 55% of stillbirths are to rural families in South Asia and sub-Saharan Africa (Lawn et al., 2016). According to Blencowe et al. (2016), though there were more stillbirths in South Asia with a stillbirth rate of 26.7 per 1000 births, sub-Saharan Africa had the highest stillbirth rate of 29 per 1000 births.

As earlier alluded to, there has been a very slow decline in the global stillbirth rate, but the slowest decrease was observed in the sub-Saharan Africa, where there was almost no change, while the rate in East Asia was reduced by half (Lawn et al., 2016). Undoubtedly, the sub-Saharan Africa region has the largest burden in terms of the number of cases of stillbirths, contributing about 60% of the global perinatal mortality (Blencowe et al., 2016).

Majority of these deaths in sub-Saharan Africa are due to high percentage of home deliveries, poor antenatal clinic attendance, inaccessible healthcare facilities, poverty and inadequate healthcare personnel especially midwives (Aminu et al., 2017).

Zambia has a crude stillbirth rate reported at 21 per 1000 births (Stringer et al., 2011). In this study, which was conducted in Lusaka, Zambia, it was established that stillbirths could be prevented by improving antenatal screening and offering quality care to women in labour. In another study conducted in Mansa by Kasengele et al., (2017), the fresh stillbirth rate was 29.3 per 1000 births as opposed to less than 5 per 1000 births recommended by the WHO as part of the vision 2020 on stillbirths (Goldenberg et al., 2011). It was highlighted in this audit that there was suboptimal care and inadequate monitoring of women in labour using a partograph, and that most of the standards essential to reduce fresh stillbirths were not being met.

2.2 Service related Factors

2.2.1 Knowledge of healthcare providers

The quality of healthcare services mainly depends on practitioners' knowledge and technical skills (Mosadeghrad, 2014). These are the most important factors that influence the quality of work. Healthcare professionals should improve their competencies (attitudes, knowledge, and skills) to deliver high-quality services. Knowledge benefits patients, hence, resources like internet, journals, and books should be available to health personnel in order for them to be updated with the latest data (Mosadeghrad, 2014).

According to Mosadeghrad, (2014), most healthcare providers reported several barriers to implementing recommended practice. Firstly, health workers were sometimes unaware of current recommended effective practices, this affects health workers' quality of work because they are not updated on the latest information available (Munabi-Babigumira et al., 2017). Secondly, health workers' flexibility, attitudes, and beliefs about medical knowledge and skills sometimes influence their receptivity to new practice knowledge (Munabi-Babigumira et al., 2017).

The lack of knowledge of current recommended practices was not always viewed as problematic by health workers since they had textbook knowledge on case management. In addition, lack of training and skills in networking, epidemiology, research appraisal, or critical thinking about clinical practice limited health workers' awareness and receptivity to clinical practice changes, and this lack of skills led some professionals to prefer old, familiar procedures (Munabi-Babigumira et al., 2017). Njoku (2015) carried out a cross sectional study on poor knowledge on causes and prevention of stillbirths among healthcare providers in Nigeria. The objective of the study was to assess the level of knowledge of healthcare providers on the causes and prevention of stillbirths. The findings were as follows; out of 201 respondents; 62.7% of the respondents had poor knowledge, 31.1% and 5.5% of the respondents were grouped under poor and fair knowledge on the causes and prevention of stillbirths respectively.

Bjerregaard-Andersen et al. (2018) carried out a hospital and community-based study on stillbirths in urban Guinea-Bissau. The results of the study were as follows; a total of 38, 164 deliveries were registered, among them 3,762 were stillbirths (99/1000 births). Of these, 768 were stillbirths (50/1000). Of 11, 769 hospital deliveries among women from Bissau with data on foetal movement, 866 (74/1000) were stillbirths, and 609 (70.3%) of these were fresh stillbirths. In the community cohort, antenatal care (ANC) attendance correlated strongly with stillbirth reduction; the stillbirth rate was 71/1000 if the mother did not attend ANC consultations versus 36/1000 if she attended seven consultations. The researchers concluded that in Bissau, the stillbirth rate is alarmingly high and the majority of stillbirths are preventable fresh stillbirths.

2.2.2 Healthcare providers' (midwives) care of women in labour

Quality and timing of intrapartum obstetric care is key to preventing fresh stillbirths Sub-standard care contributes to 20-30% of all stillbirths, and the contribution is even higher for late-gestation fresh stillbirths (Flenady et al., 2016). Management of women experiencing risk of fresh stillbirth is a simple yet strong indicator of quality of care. Sub-standard care leads to perinatal as well as maternal risks, which are related to unnecessary complex, time consuming, and costly interventions (Flenady et al., 2016). Furthermore, suboptimal interpersonal care can undermine even the best clinical care, and produce harm to the mother in labour and the foetus. Improvement of obstetric care is warranted to end preventable birth-related deaths and disabilities (Maaløe et al., 2016).

A cross-sectional retrospective study conducted by Jammeh et al., (2010) on stillbirths in rural hospitals in Gambia. The objective of the study was to determine the stillbirth rate and associated factors among women who delivered in rural hospitals in Gambia. The findings of the researchers were that hospital-based stillbirth rate was high; 156 per 1000 births. Of the 1,519 deliveries, there were 237 stillbirths, of which 137 (57.8%) were fresh. Severe obstetric complication, birth weight of less than 2500g, caesarean section deliveries, and referral from peripheral health facility were highly significantly associated with higher stillbirths' rates. Half (50%) of the women with stillbirths had no ANC. The researchers concluded that improved intrapartum care, supported by emergency transport services and skilled personnel could positively impact on perinatal outcomes in rural hospitals in the Gambia.

However, in a study done by Tshibumbu and Blitz (2016) on modifiable antenatal risk factors for stillbirth amongst pregnant women in Namibia, Omusati region, it was discovered that 11 (78.6%) modifiable risk factors were prevalent amongst women who had stillbirth; risk factors associated with quality of ANC were the most prevalent. The aim of the study was to determine the prevalence of modifiable risk factors associated with stillbirth so as to determine possible gaps in their prevention. The researchers found that the average prevalence of each category was as follows: quality of antenatal care (19.8%), maternal characteristics (11.4%), medical conditions (8.9%) and obstetric complications (6.5%). The most prevalent risk factors included; no folate supplementation (30.5%), HIV infection (25.6%), late booking (16.7%), intrauterine foetal growth retardation (13.4%) and alcohol use (12.5%).

Additionally, in a study conducted in Nigeria (Opiah et al., 2012), only 37.5% and 32.6% of cases in the two chosen health facilities used the partograph. Furthermore, only 16% of women in labour had the foetal heart rate monitored half hourly. According to Buchmann et al. (2012), in a study conducted in South Africa, they concluded that there appeared to be a failure to detect or respond to evidence of foetal distress, even in facilities with skilled staff and available resource. This is similar with the setting in this study where the health facility has skilled staff but the numbers of stillbirths are still high.

2.3 Socio-economic Factors

A number of studies have linked socio-economic factors to occurrence of stillbirths. A case control study was carried out by Ashish et al., (2015) on risk factors for antepartum stillbirths in Nepal. The aim of the study was to identify the specific risk factors that are associated with antepartum stillbirth. The researchers found that out of 4567 women who delivered in the hospital, there were 307 antepartum stillbirths and found the following risk factors to be associated with stillbirths; increasing maternal age (OR-1.0), less than five years of maternal education (OR-2.4), increasing parity (OR-1.2), previous stillbirths (OR-2.6), no ANC attendance (OR-4.2), belonging to the poorest family (OR-1.3), antepartum haemorrhage (OR-3.7), maternal hypertensive disorder during pregnancy (OR-2.1) and small weight-for-gestational age babies (OR-1.5). The researchers concluded that there was an association between belonging to a poorest family and stillbirths.

Studies also show that half of pregnant women deliver at home (CSO, et al., 2015; Kwaleyela et al., 2015) for reasons that include logistical difficulties in accessing clinical care, transportation costs and a lack of adequate health education from healthcare facilities. Delay in accessing care may lead to fresh stillbirths. Additionally, Aminu et al. (2014) conducted a study on causes of and factors associated with stillbirth in LMIC. The objective of the study was to determine factors associated with fresh stillbirths. The researchers found that factors reported to be associated with stillbirth include poverty and lack of education, maternal age; >35 or < 20 years, parity; 1 or >5, lack of antenatal care, prematurity, low birth weight and previous stillbirth. The most frequently reported cause of stillbirth was maternal factors (8–50%) including syphilis, positive HIV status with low CD4 count, malaria and diabetes. asphyxia and birth trauma (3.1–25%), umbilical problems (2.9 – 33.3%). The researchers concluded that, it is important to build capacity for perinatal death audit and to develop clear guidelines and a suitable classification system to assign cause of death.

2.4 Cultural Factors

Cultural practices that discourage women from seeking healthcare contribute to fresh stillbirths. In a study conducted in India by Roberts et al., (2012), it was noted that women lose their basic human rights and whatever autonomy they might have had before marriage; they lose their dignity as they must submit to the wishes of their husbands and in-laws on issues concerning their health.

These women, therefore, cannot make a decision to seek healthcare during pregnancy and labour thus complications are missed and this may contribute to fresh stillbirths. Other cultural practices that may contribute to fresh stillbirths include prescribing birthing practices such as being delivered by Traditional Birth Attendant rather than being surrounded by strangers at a health facility.

The Traditional Birth Attendants advise women on appropriate cultural childbirth practices and assists with deliveries at home. They also advise women on the use of traditional remedies to widen the birth canal and to precipitate labour. Additionally, if something goes wrong during labour, they rely on spiritual healing, traditional beliefs and witchcraft to explain the problems or complication. The woman is blamed and expected to confess the alleged 'bad' behaviour which led to delivery of a stillbirth (Maimbolwa et al., 2012). In a study conducted by Agaba et al., (2016), it was discovered that use of traditional herbs was found to be linked to fresh stillbirths; 93.1% of the stillbirths were attributed to a mother using herbs to quicken the process of child delivery compared to 6.9% that were not due to herbs.

2.5 Maternal and foetal related factors

A number of maternal and foetal factors have been discovered to contribute to fresh stillbirths by a variety of researchers. Halim et al. (2018) carried out a study on stillbirth surveillance and review in rural districts in Bangladesh. The aim of the study was to understand the cause of and factors associated with stillbirths. The findings of the study included the following; 63.9% were intrapartum stillbirths, stillbirth rate obtained was 20.4 per 1000 births and 53.9% of stillbirths occurred at home.

The three most frequent causes of stillbirths were maternal hypertension or eclampsia (15.2%), antepartum haemorrhage (13.7%) and maternal infections (8.9%). The researchers concluded that, there is need to introduce surveillance for stillbirths at community level. In a study conducted by Froen et al. (2016) the researchers established that prematurity was a major contributing factor to fresh stillbirths and that majority of fresh stillbirths were premature deliveries and more than three quarters of the foetuses had complications prior to birth. The common complications were mainly potential foetal distress following premature rupture of membranes and intrauterine foetal growth retardation.

This demonstrated that, foetal complications during pregnancies, and foetal distress during labour, were associated with fresh stillbirths in cases where mothers were not given quality care.

2.6 Summary

The reviewed literature revealed that quality antepartum and intrapartum care were key in the reduction of fresh stillbirths. Lack of adequate staff led to low utilisation of the partograph, inadequate triaging of patients and poor monitoring of women in labour; hence, limiting the potential to notice foetal distress timely. Lack of necessary equipment for monitoring of very sick patients and triaging of patients, led to health care providers missing important cues for identifying emergency cases; hence, increasing the number of fresh stillbirths. In addition, inadequate knowledge by the healthcare providers was shown to hinder provision of quality care. The literature review also revealed that there was limited documented information regarding stillbirths from the Zambian perspective; hence, the need to conduct this study.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This study sought to determine factors that were associated with fresh stillbirths in Livingstone, Zambia. In this chapter, the study design, study setting, study population, sample selection methods and sample size are presented. In addition, the data collection technique, data collection tools as well as validity, reliability, and ethical considerations for the study are discussed.

3.1 Study Design

This was a descriptive cross sectional study. This design was identified to be suitable because it enabled the researcher to observe multiple variables at once and make inferences about possible relationships among them while illustrating them as they appeared.

3.2 Study Setting

The study was conducted at Livingstone Central Hospital and three clinics in the district, namely; Maramba, Libuyu and Mahatma Gandhi. Management of the three clinics is by Livingstone District Health Office (LDHO). Livingstone Central Hospital is the only referral hospital in Livingstone district. It is also the only third level hospital in Southern province. The specific health facility sites where data were collected were antenatal, labour and postnatal wards.

3.3 Study Population

The study population comprised of midwives working in the antenatal, labour and postnatal wards at Livingstone Central Hospital and the three selected clinics in the district, as well as records of mothers, who gave birth at Livingstone Central Hospital in the period January to December, 2018.

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion criteria

The inclusion criteria for participating in the study included:

Midwives

- Working in the maternity wings of the selected health facilities for at least one year.

Records

- Correctly filled in partograph, doctors' notes and delivery register.

3.4.2 Exclusion criteria

The exclusion criteria were:

Midwives

- Not being available in the facility during the data collection period.
- Not consenting to participate in the study.

Records

- Mother who died during the process of giving birth.

3.5 Sample Selection

Purposive sampling was used to select Livingstone Central hospital, while simple random sampling was used to select clinics in the district. Since the number of midwives in the clinic was limited, convenience sampling was used to select the ones who participated; hence, all the midwives who were on duty during the period of data collection were selected. Simple random sampling was used to select mothers' records.

3.6 Sample Size

3.6.1 Calculation of the sample size for mothers' records

The sample size for mothers' records was calculated using the formula for finite population by Krejcie and Morgan (1970) as shown below.

$$\textbf{n} \quad = \quad \frac{\underline{Z^2\ P\ (1-P)}}{d^2}$$

Where **P** = the prevalence for this study was obtained from a study conducted by Stringer et al (2011) which was conducted in Lusaka where it was found to be 20%.

$$Z \quad = \quad 1.96 \text{ is the standard normal variate at 95\% confidence level}$$

$$d \quad = \quad \pm 5\% = \pm 0.05 \text{ is the precision}$$

$$n \quad = \quad \frac{\underline{1.96^2 \text{ x } 0.2 \text{ x } 0.8}}{0.05^2} = \text{the desired sample is 245}$$

Therefore the sample size was 245 records.

3.6.2 Calculation of sample size for midwives

$$n = \quad \frac{\underline{Z^2\ P\ (1-P)}}{d^2}$$

Where P = Proportion of midwives in the district 50% or 0.5 since no study has been done on the subject before.

$$Z = \quad 1.96 \text{ is the standard normal variate at 95\% confidence level}$$

$$d = \quad \pm 5\% = \pm 0.05 \text{ is the precision}$$

$$n = \quad \frac{\underline{1.96^2 \text{ x } 0.5 \text{ x } 0.5}}{0.05^2} =$$

Since the average target population of midwives is finite, that is less than 1000 (thus 210). Therefore the population size was adjusted to get the final "n" as follows:

Where N = population size = 210

Final n = $\underline{\text{n}}$

$\quad\quad$ 1+ $\underline{\text{n}}$

$\quad\quad\quad$ N

Final n = $\underline{384}$ $\quad$ = $\quad$ $\underline{384}$ $\quad$ = $\quad$ 135.8

$\quad\quad$ 1+ $\underline{384}$ $\quad\quad$ 2.83

$\quad\quad\quad$ 210

Therefore the sample size for midwives was 136.

Since the number of midwives was less than 135, all the midwives working in the labour wards were included in the study and the total number was 35.

3.7 Data Collection

Collection of data was done from 28th August to 25th September, 2019.

3.7.1 Data Collection Tools

Data collection tools used for this study were a semi-structured self-administered questionnaire adapted from the WHO (2018) (Appendix I) and a checklist (Appendix II) containing variables that were utilised to review women's records. The questionnaire had both closed and open-ended questions, and comprised of four sections. Section A consisted of the respondents' socio-demographic characteristics; section B had questions assessing respondents' knowledge on management of a woman in labour and use of a partograph; section C consisted of questions on availability of resources; and section D consisted of questions regarding in-service training and updates on management of women in labour.

Section A of the checklist consisted of the mothers' socio-demographic data; section B assessed the care that was offered during labour (foetal monitoring, progress of labour, and maternal wellbeing); and section C assessed presence of complications.

3.7.2 Data Collection Technique

Before distributing the questionnaires to the respondents, the researcher obtained permission from the respective health institutions and consent from each respondent. The researcher greeted the respondents, introduced herself and explained the purpose of the study, as well as the risks and the benefits of the study. The respondents were assured of confidentiality and informed that participation was voluntary; hence they were free to withdraw at any stage without encountering negative repercussions.

The respondents were encouraged to ask questions. After consenting to participate in the study by signing the consent form (Appendix IV), they were given an information sheet (Appendix III). Each respondent was then provided with a questionnaire to fill in. Each questionnaire and its matching informed consent form were assigned a three digit identifier. In order to uphold confidentiality, the three digit identifier number, as opposed to the name, was used for further analyses. The researcher collected the completed questionnaires at the end of the respondents' working shift and thanked each respondent. The checklist was used to collect data pertaining to maternal and foetal characteristics from the files which were reviewed. It was also used to check off presence of obstetric, foetal and maternal characteristics and complications.

3.8 Validity and reliability

3.8.1 Validity

To ensure internal validity the tools had clearly phrased questions, in simple terms, which made the administration and understanding of the questions easy for the respondent. The data collection instruments were checked by the supervisors to ensure that they consisted of all variables that were to be measured.

To ensure external validity, the sampling methods that were used to select the records and midwives allowed for selection of participants from diverse backgrounds; hence, offering a wide perspective of midwives providing maternity care in the district. Pre-testing of the instruments was done and necessary adjustments were made accordingly.

3.8.2 Reliability

Analysis of the data was done using SPSS to avoid any miscalculations, and the sampling methods that were used to select respondents and records for data collection curbed any biasness. Research instruments were pre tested during a pilot study.

3.9 Pilot Study

The researcher conducted a pilot study at Linda urban clinic because the facility has similar characteristics as those involved in the main study. The pre-test was essential to test the effectiveness of the data collection tools. Some questions were rephrased while those that were not relevant were removed to ensure clarity and conciseness. For example, marital status was removed from the demographic data for midwives since it was not relevant to the study. The pilot study sample comprised of 10% of the total sample for the main study.

3.10 Ethical consideration

Ethical approval was sought from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) (Appendix.VII and National Health Research Authority (Appendix VIII). Written consent was obtained from each respondent after the rationale of the study was explained to them. Those who declined to participate in the study were reassured that they would not suffer any consequences as a result of not participating. A written permission was sought from the Senior Medical Superintendent for Livingstone Central Hospital and the District Health Director. The respondents were informed that participation was voluntary, and no form of payment or incentives was provided. Study respondents were told that they were free to withdraw from the study at any time without suffering any consequences. After data collection, filled in questionnaires were kept under lock and key for security and confidentiality. Anonymity and confidentiality was observed throughout by ensuring that codes were used instead of names. Data entry was done on a Password protected computer and the access code was only known by the researcher.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.0 Introduction

This chapter presents data analysis and findings of the study. The order of presentation of findings is as follows; socio-demographic characteristics of midwives and service related factors associated with fresh stillbirths. Service related factors include; knowledge of midwives on risk factors for fresh stillbirth, supplies for provision of quality maternity care, staffing to provide appropriate care to women in labour using a partograph, equipment used during labour monitoring, and in-service training of midwives in emergency obstetric and neonatal care (EmONC) and Help Baby Breath (HBB).

4.1 Data Analysis

Data entry and statistical analysis were performed using SPSS version 23. Descriptive statistics such as frequencies, proportions, means and medians were used to understand the data. To determine the statistical difference between two means or medians the t-test was used. The relationship between categorical variables (dependent versus independent) was ascertained using a Chi-square test. The Fisher Exact test was used when one or more cells had an expected frequency of 5 or less. Logistic regression models (univariate and multivariate analyses) were used to determine the factors associated with the dependent variable (fresh stillbirth). Multivariate logistic regression was used to control for confounding variables and to come up with independent contributing factors to fresh stillbirths. To ascertain the significant of a result, 95% Confidence Intervals and 5% level of significance was used.

4.2 Presentation of Findings

Findings have been presented using Frequency tables, graphs and Bar charts in two sections which are: Service related factors associated with fresh stillbirths and Maternal and foetal factors associated with fresh stillbirths. Percentages, mean, median and cross tabulations were used to summarise the four items on service related factors.

4.3 Socio-demographic characteristics of midwives.

The socio-demographic characteristics of midwives included age, years of experience working in labour ward and qualifications of the midwife.

Table 3: Socio-demographic characteristic of respondents (n=35)

Age group in years	frequency	percentage
25-35	18	51.4
36-46	12	34.3
47-57	5	14.3
Total	35	100
Mean age in years (36)		
Years of experience		
0-5	20	80
6-10	8	8.6
16-20	4	2.9
Above 20 years	3	8.6
Total	35	100
Qualification		
BSc Nursing	1	2.9
Registered midwife	18	51.4
Enrolled midwife	10	28.6
Certified midwife	6	17.1
Total	35	100

Table 3 shows that 51.4% (18) of the midwives were aged between 25-35 years, and the mean age was 36 years. More than three quarters (80%; 20) had years of work experience between 0-5 years, while those above 20 years of experience were 8.6% (3). Slightly over half, 51.4% (18) were registered midwives, while 2.9% (1) had a BSc nursing degree.

4.4 Service related factors according to midwives

This section elicited service related factors that could contribute to fresh stillbirths in Livingstone district. These included availability of equipment, midwives' knowledge of fresh stillbirths, staffing and in-service training.

Table 4: Responses of the respondents on service related factors (n=35)

Availability of equipment	Frequency	Percentage
Always available	21	60
Occasionally available	10	28.6
Not available	4	11.4
Total	35	100
Knowledge of midwives on fresh stillbirths	Frequency	Percentage
High level knowledge (80% and above)	2	5.7
Medium level knowledge (79-70%)	8	22.9
Low level knowledge (less than 70%)	25	71.4
Total	35	100
Adequate staffing levels in the labour wards	**frequency**	**Percentage**
Strongly agree	4	11.4
Agree	9	25.7
Disagree	22	62.9
Total	35	100
Training in EmONC and HBB		
No	28	80
Yes	7	20
Total	35	100

Table 4 shows that 71.4% (25) of the midwives had low knowledge on fresh stillbirths, while those with high knowledge levels were only 5.7% (2). A high number, 62.9% (22) disagreed that there was adequate staffing in the labour wards, while those that strongly agreed and agreed were 11.4% (4) and 25.7% (9), respectively. The table also shows that majority 80% (28) were not trained in EmONC and HBB as compared to only 20% (7) who were trained.

4.5 Characteristics of women whose files were reviewed.

Table 5: Socio-demographic characteristics (n=245)

Variable	Frequency	Percent (%)
Age group		
13-19	69	28.2
20-29	88	35.9
30-39	84	34.3
40-49	4	1.6
Total	245	100
Mean age in years (n=245) 25.76		
Marital status		
Married	168	68.6
Single	77	31.4
Total	245	100
Residence		
Urban	178	72.7
Rural	67	27.3
Total	245	100
Education		
No formal education	13	5.3
Primary	58	23.7
Secondary	150	61.2
Tertiary	24	9.8
Total	245	100

Table 5 shows that 68.6% (168) of the women were married, 35.9% (88) were in the age group 20-29 years, and 72.7% (178) were from the urban area, while 27.3% (67) were from the rural area, and 61.2% (150) went up to secondary school level of education.

Table 6: Socio-demographic characteristics (n=245)

Occupation	Frequency	Percentage
None	171	69.8
Farmer	15	6.1
Trader	38	15.5
Formal employment	21	8.6
Total	245	100
Parity		
1-3	86	37.5
4-6	117	51.1
Above 6	26	11.4
Total	245	100

More than half (69.8%, n=171) of the women were not in any form of employment, while 51.1% (117) had 1-3 children, and those with parity above 6 were 11.4% (26).

4.6 Foetal and labour characteristics of study subjects
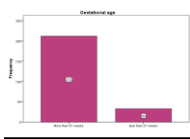
Figure 3: frequency data by gestational age by week (n=245)

Figure 3 shows that more than three quarters (84%; 212) of the mothers' records sampled, had gestational ages at birth above 37 weeks, while 16% (33) were below 37 weeks.
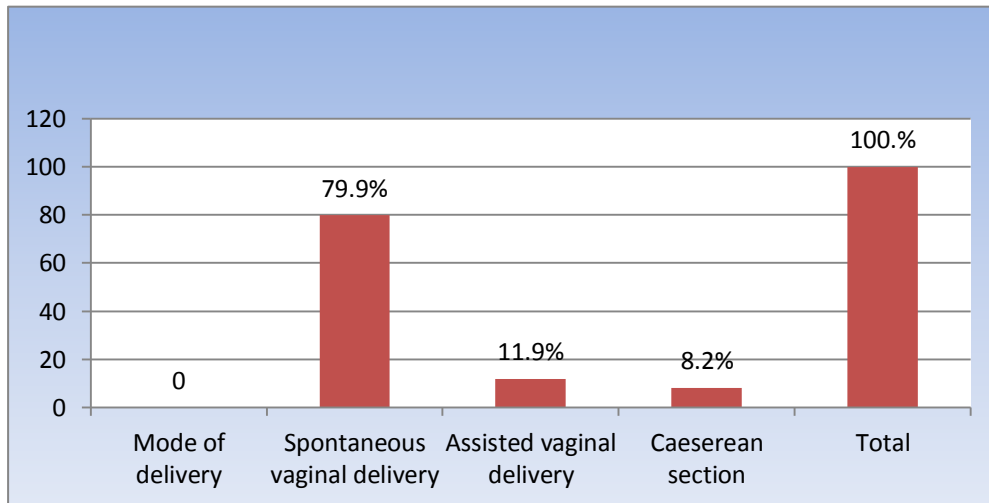
Figure 4: Mode of delivery (n=245)

Figure 4 shows that more than three quarters (79.9%; 196) of the births were spontaneous vaginal deliveries, 11.9% (29) were caeserean births and 8.2% (20) were assisted vaginal deliveries.
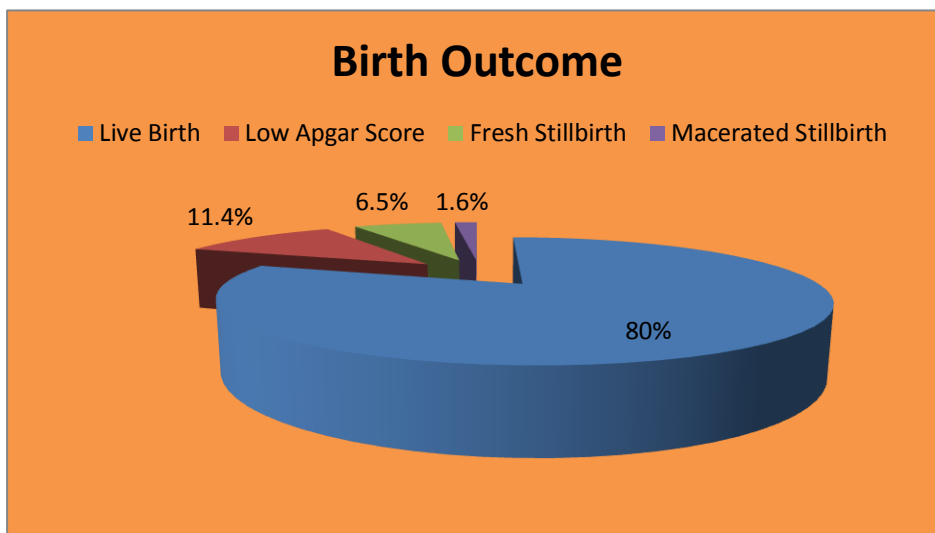
Figure 5: Birth outcome (n=245)

Figure 5 shows that more than three quarters (80%; 196) of births were live with good Apgar score, 11.4% (28) were live births with low Apgar score 6.5% (16) were fresh stillbirths, , and 1.6% (5) were macerated stillbirths.

4.7 Labour monitoring
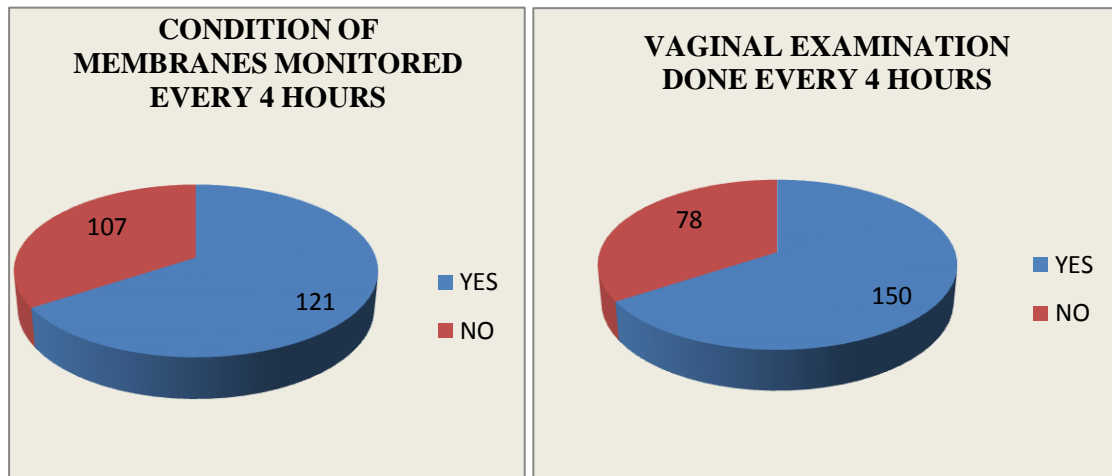
Figure 6: Frequency data by vaginal examination and condition of membranes monitoring (n=228)

Figure 6 shows that out of 228 women who were admitted in the first stage of labour, vaginal examination (VE) every 4 hours were done in 72% (162) of them, and VE was infrequently done in 28% (64). The condition of membranes was documented in 53% (121) of the women, while 47% (107) did not have the condition of membranes document

4.8 Foetal wellbeing monitoring
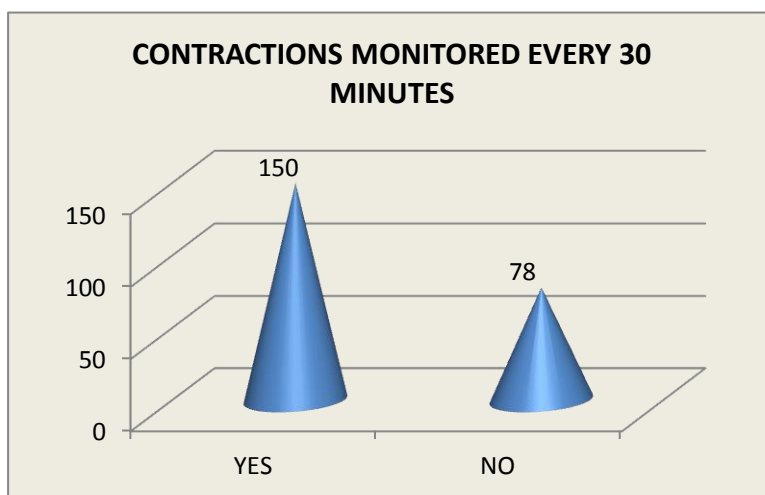
Figure 7: Frequency data by contractions monitoring (n=228)

Figure 7 shows that contractions were monitored in 66.7% (150) of the women, while 34.7% (68) of the women were not monitored.

FOETAL WELBEING MONITORING
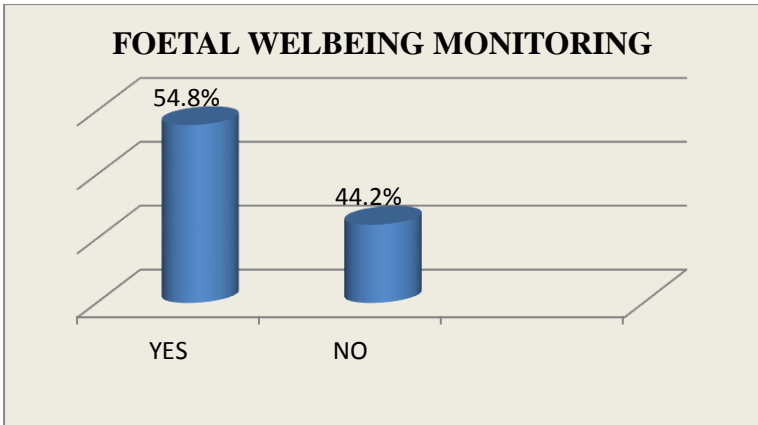
Figure 8: Frequency data by foetal heart rate monitoring (n=228)

Figure 8 shows that more than half (54.8%; n=125) of the mothers were monitored for foetal heart rate every 30 minutes, while 44.2% (103) were not monitored.

CONDITION OF AMNIOTIC FLUID DOCUMENTED EVERY 4 HOURS
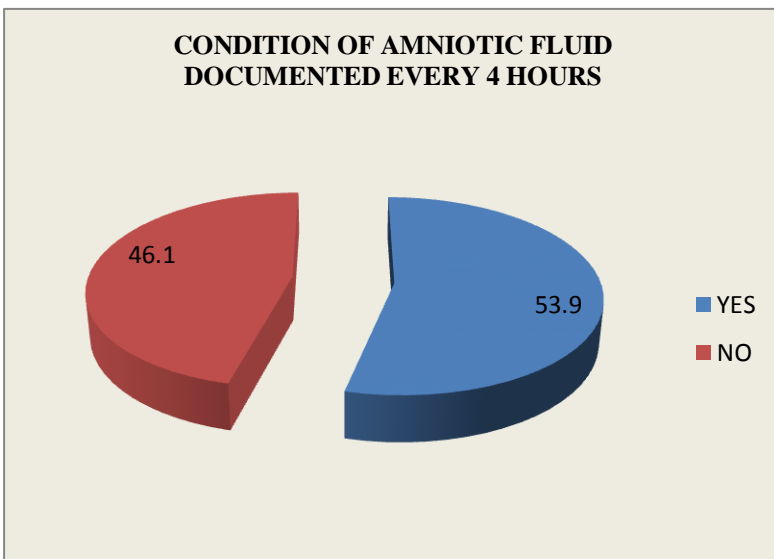
Figure 9: Frequency data by condition of amniotic fluid noted during vaginal examination (n=228)

Figure 9 shows that condition of amniotic fluid was noted and documented in more than half (53.9%, n=123) of the women, while more than a quarter (46.1%, n=105) of the women were not monitored.

4.9 Maternal wellbeing monitoring
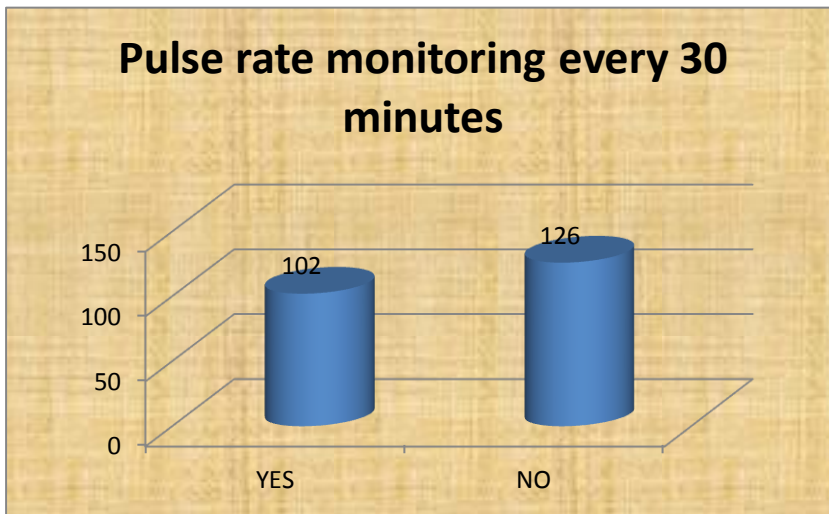
Figure 10: Frequency data by pulse rate monitoring (n=228)

Figure 10 shows that less than half (47.7%, n=102) of the mothers had their pulse rate monitored, while (42.3%, n=126) were not monitored.
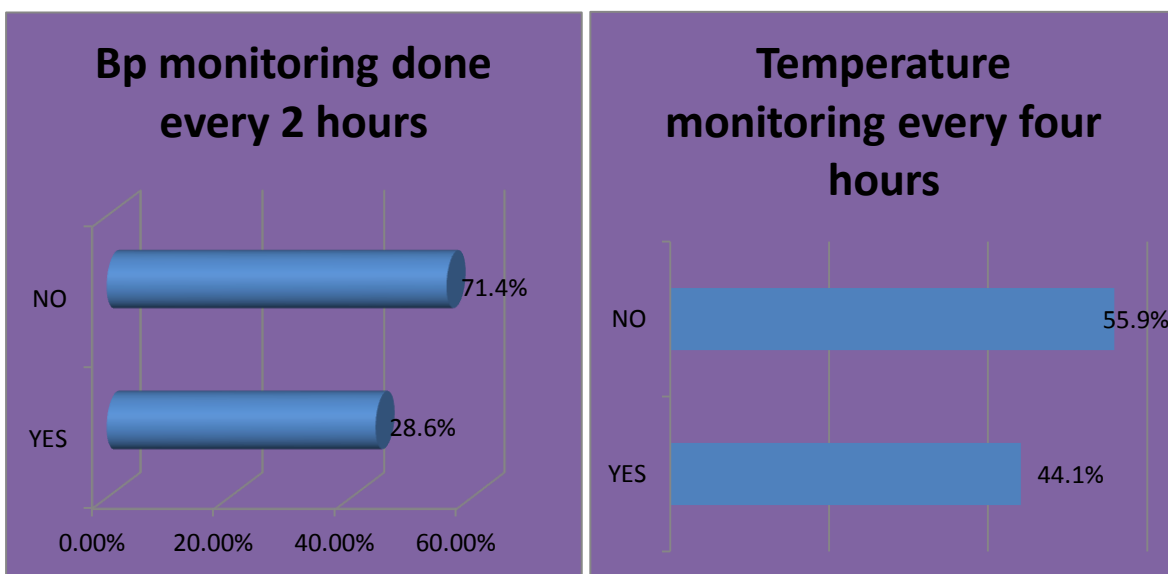
Figure 11: frequency data by blood pressure and temperature monitoring (n=228)

Figure 11 shows that two hourly blood pressure monitoring was done (28.6%, n=65) of mothers, while more than a half (71.4%, n=163) did not have their blood pressure monitored. Four hourly temperature monitoring was done in less than half (44.1%, n=108) of the women, whereas almost half (49.4%, n=121) did not have their temperature monitored four hourly.

4.10 Presence of foetal and maternal complications
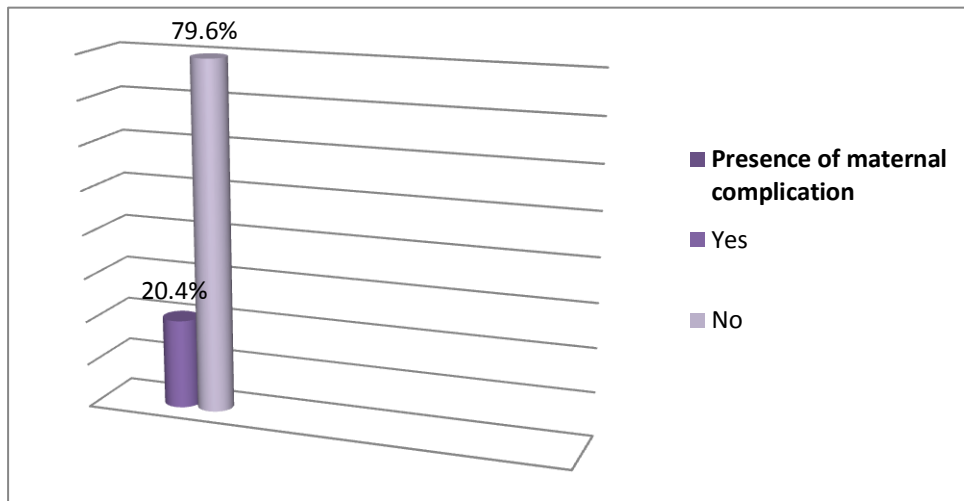
Figure 12: Frequency data by maternal complications (n=245)

Figure 12 shows that, more than three quarters (79.6%; 195) of the mothers had no complications, while 20.4% (50) had complications.
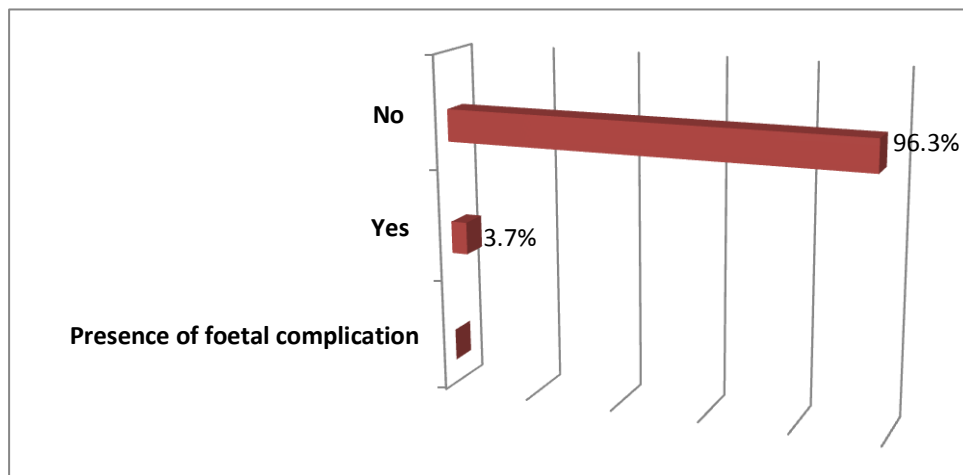
Figure 13: Frequency data by foetal complications (n=245)

Figure 13 shows that among the births, only 3.7% (10) had foetal complications, compared to 96.3% (235) who did not have a complication.

4.11 Referrals
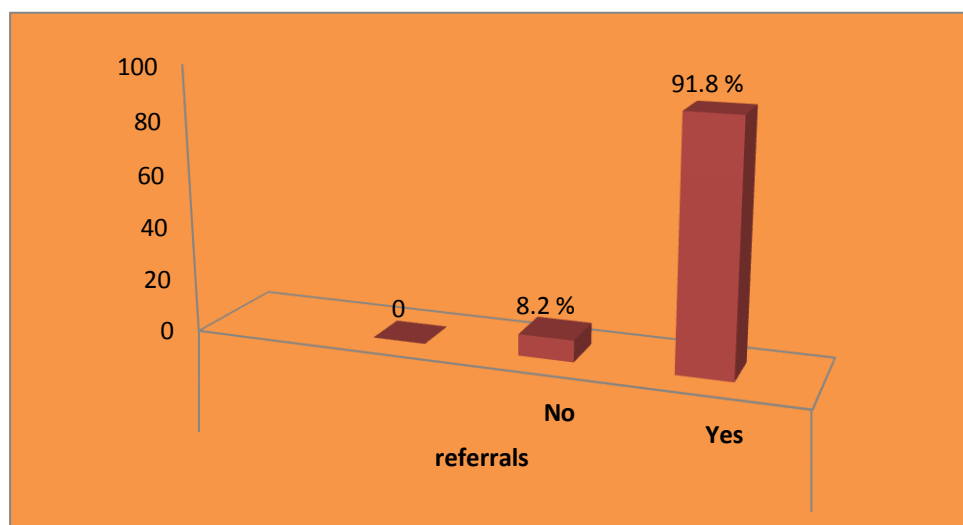
Figure 14: Referrals from various centres (n=245)

Figure 14 shows that majority (91.8%, n=225) of the mothers were referred from the various delivery centres in the district, while 8.2% (20) were not referred.

4.12 Association between fresh stillbirths and maternal characteristics

Table 7: Age of mothers (n=245)

Variable	N=245		Fresh Stillbirth		
	Frequency	Percent (%)	Yes	No	p-value
Age					
13-19	66	26.9	8 (50%)	53 (23.1%)	0.243[f]
20-29	89	36.3	4 (25%)	80 (34.9%)	
30-39	86	35.2	4 (25%)	76 (33.2%)	
40-49	4	1.6	0 (0%)	4 (1.75)	
Total	245	100	16	229	

Table 7 shows that half (50%; 8) of the fresh stillbirths were born from teenage mothers, while none of the mothers aged between 40-49 years had a fresh stillbirth. Those in the age groups 20-29 and 30-39 had a quarter (25%; 4) of fresh stillbirths each.

Table 8: Marital status and residential area in relation to fresh stillbirths (n=245)

Variable	*N=245*		Fresh Stillbirth		
	Frequency	Percent (%)	Yes	No	p-value
Marital Status					
Married	168	68.6	14 (87.5)	154 (67.3)	
Single	77	31.4	2 (12.5)	75 (32.8)	0.092
Total	245	100	16	229	
Residential Area					
Urban	178	72.7	10 (62.5)	168 (73.4)	
Rural	67	27.3	6 (37.5)	61 (26.6)	0.386[f]
Total	245	100	16	229	

Table 8 shows that 87.5% (14) of the fresh stillbirths were from married women, while 12.5% (2) were from single mothers. The table also shows that 37.5% (6) of the women from rural areas had fresh stillbirths, whilst 62.5% (10) were from urban areas.

Table 9: Educational background of the mother in relation to fresh stillbirth (n=245)

Variable	*N=245*		Fresh Stillbirth		
	Frequency	Percent (%)	Yes	No	p-value
Education					
No Formal Education	13	5.3	0	13 (5.7)	
Primary	58	23.7	3 (18.8)	55 (24.0)	0.801[f]
Secondary	150	61.2	11 (68.7)	139 (60.7)	
Tertiary	24	9.8	2 (12.5)	22 (9.6)	
Total	245	100	16 (100)	229 (100)	

Table 9 shows that the relationship between educational level and fresh stillbirths was not statistically significant, with a p-value of 0.801[f.]

Table 10: Occupation of the mother in relation to fresh stillbirth (n=245)

Variable	N=245		Fresh Stillbirth		
	Frequency	Percent (%)	Yes	No	p-value
Occupation of the mother					
No work	171	69.8	9 (56.2)	162 (70.7)	
Farmer	15	6.1	1 (6.3)	14 (6.1)	0.267^f
Trade	38	15.5	5 (31.2)	33 (14.4)	
Formal employment	21	8.6	1 (6.3)	20 (8.7)	
Total	245	100	16 (100)	229 (100)	

Table 10 shows that the relationship between occupation of the mother and fresh stillbirths was not statistically significant, with a p-value of $0.267^{f.}$

Table 11: Parity in relation to fresh stillbirth (n=245)

Variable	N=245		Fresh Stillbirth		
	Frequency	Percent (%)	Yes	No	p-value
Parity					
1-3	86	35.1	10 (62.5)	76 (33.2)	0.093^t
4-6	117	47.8	6 (37.5)	127 (55.5)	
Above 6	42	17.1	0	26 (11.4)	
Total	245	100	16 (100)	229 (100)	

Table 11 shows that the relationship between parity and fresh stillbirths was not statistically significant with a p-value of $0.093^{t.}$

4.13 Association between fresh stillbirths and foetal characteristics

Table 12: Presence of cord accidents and gestational age in relation to fresh stillbirths

Variable	Frequency	Percent (%)	Fresh Stillbirth	No fresh stillbirth	p-value
Presence of Cord Accident					
Yes	9	3.7	2 (12.5)	7 (3.1)	0.110[f]
No	236	96.3	14 (87.5)	222 (96.9)	
Total	245	100	16 (100)	229 (100)	
Gestational Age					
Less than 37 weeks	33	16.7	10 (18.8)	23 (16.6)	0.000[f]
Above 37 weeks	212	83.3	6 (81.2)	206 (83.4)	
Total	245	100			

Table 12 shows that the p value between presence of cord accident and fresh stillbirth was 0.110[f] and it was not statistically significant. On the other hand, the association between fresh stillbirth and gestational age was statistically significant with a p-value of 0.000[f.]

4.14 Association between fresh stillbirths and mode of delivery

Table 13: Mode of delivery (n=245)

Variable	Frequency	Percent (%)	Fresh Stillbirth		
			Yes	No	p-value
Mode of Delivery					
Normal vaginal delivery	195	79.9	10 (62.6)	185 (81.1)	0.736[f]
Assisted vaginal delivery	20	8.2	3 (18.7)	17 (7.5)	
Caesarean delivery	29	11.9	3 (18.7)	26 (11.4)	
Total	245	100	16 (100)	229 (100)	

According to Table 13 the p-value (0.736[f]) of the association between mode of delivery and fresh stillbirth was not statistically significant.

4.15 Association between fresh stillbirths and foetal, labour and maternal monitoring

Table 14: Monitoring (n=245)

Characteristic	*N*=245	Fresh stillbirth		p-value
		Yes, 16 (6.5%)	No, 229 (93.5%)	
Foetal wellbeing monitoring				
Yes	136	8 (7.3)	128 (92.7)	0.646
No	109	8 (5.9)	101 (94.1)	
Progress of labour monitoring				
Yes	45	2 (4.4)	43 (95.6)	0.743[f]
No	200	14 (7.0)	186 (93.0)	
Maternal wellbeing monitoring				
Yes	42	5 (11.9)	37(88.1)	0.162[f]
No	203	11 (5.4)	192(94.6)	

***N*=total number of participants; *f*=Fisher's Exact Test**

Table 14 shows that the p-value for fresh stillbirths and foetal wellbeing monitoring was 0.646; between progress of labour monitoring and fresh stillbirth p-value was 0.743[f]; and between maternal wellbeing monitoring and fresh stillbirth p-value was 0.162[f]. All the three measured parameters were not statistically significant.

4.16 Association between fresh stillbirths and complications

Table 15: Association between fresh stillbirth and maternal, labour and foetal complications (n=245)

		Fresh stillbirth		
Characteristic	*N*=245	**Yes, 16 (6.5%)**	**No, 229 (93.5%)**	**p-value**
Complications				
No complication	189	6 (3.2)	183 (96.8)	0.001[f]
Maternal complication	12	2 (16.7)	10 (83.3)	
Labour complication	21	3 (14.3)	18 (85.7)	
Foetal complication	23	5 (21.7)	18 (78.3)	
Total	245	16 (100)	229 (100)	

Table 15 shows that the association between fresh stillbirth and complications (maternal, labour, and foetal) was statistically significant with a p-value of 0.001.

4.17 Association between fresh stillbirths and referrals

Table 16: **Referred cases (n=245)**

Variable	**Frequency**	**Percent (%)**	**Fresh Stillbirth**		
			Yes	**No**	**p-value**
Yes	225	91.8	16 (100)	209 (91.3)	0.376[f]
No	20	8.2	0	20 (8.7)	
Total	245	100	16 (100)	229 (100)	

Table 16 shows that the association between fresh stillbirths and referrals from surrounding clinics was not statistically significant with a p-value of 0.376.

4.18 Factors Associated with fresh stillbirth (Univariable and Multivariable analysis)

Table 17: Univariable and multivariable analysis of socio-demographic characteristics, marital status, residence, education and occupation with fresh stillbirth

Characteristic	Univariable analysis		Multivariable analysis	
	OR (95%CI)	P-value	OR (95%CI)	P-value
Age	1.02 (.95, 1.10)	0.511	1.03 (0.94, 1.12)	0.506
Parity	0.95 (0.67, 1.36)	0.787		
marital status				
Married	Ref			
Single	0.9 (0.06, 1.32)	0.111		
Residence				
Urban	Ref			
Rural	1.65 (0.58, 4.74)	0.350		
Education level				
No formal education	Ref			
Primary	0.6 (0.09, 3.84)	0.590		
Secondary	0.87 (0.18, 4.19)	0.863		
Tertiary	1			
Occupation				
No work	Ref			
Farming	1.29 (0.15, 10.89)	0.818	0.84 (0.08, 8.27)	0.885
Trade	2.73 (0.86, 8.66)	0.089	5.50 (1.29, 23.36)	0.021
In formal employment	0.90 (0.11, 7.48)	0.922	1.25 (0.12, 12.92)	0.851

Table 17 shows that the socio-demographic factors of age (p-value 0.511), parity (p-value 0.787), marital status (p-value 0.111), residence (p-value-0.350), and educational level (p-value 0.590) were all not statistically significantly with fresh stillbirth. However, there was a statistical significance between fresh stillbirths and trade as the occupation of the woman with a p-value of 0.021.

Table 18: Univariable and multivariable analysis of factors associated with fresh stillbirth and presence of cord accident, gestational age, mode of delivery, foetal wellbeing monitoring, progress of labour monitoring, and maternal wellbeing monitoring

Characteristic	Univariable analysis		Multivariable analysis	
	OR (95%CI)	P-value	OR (95%CI)	P-value
Presence of cord accident				
Yes	Ref			
No	0.22 (0.04, 1.16)	0.075	0.12 (0.02, 0.91)	0.040
Gestational Age				
Less than 37 weeks	Ref			
Above 37 weeks	0.86 (0.23, 3.17)	0.003		
Mode of delivery				
Normal vaginal delivery	Ref			
Assisted vaginal delivery	3.26 (0.82, 13.01)	0.093	1.21 (0.21, 6.88)	0.832
Foetal wellbeing monitoring				
No	Ref			
Yes	0.79 (0.29, 2.180	0.647		
Progress of labour monitoring				
No	Ref			
Yes	0.62 (0.14, 2.820	0.534		
Maternal wellbeing monitoring				
No	Ref			
Yes	2.36 (0.77, 7.19)	0.131		

Table 18 shows that there was a statistical significance between fresh stillbirths and cord accidents with a p-value of 0.040. On the other hand, the table also shows that the p-values between gestational age and fresh stillbirth (0.823); fresh stillbirth and mode of delivery (0.093); fresh stillbirths and foetal wellbeing monitoring (0.647); fresh stillbirths and progress of labour monitoring (0.534); and fresh stillbirths and monitoring (0.131) were not statistically significant.

Table 19: Univariable and multivariable analysis of factors associated with fresh stillbirth and complications (maternal, labour, and foetal)

	Univariable analysis		Multivariable analysis	
Characteristic	OR (95%CI)	P-value	OR (95%CI)	P-value
Complications				
No complication	Ref			
Maternal complication	6.10 (1.09, 34.14)	0.040	13.19 (1.73, 100.57)	0.013
Labour complication	5.08 (1.17, 22.06)	0.030	19.12 (2.51, 145.86)	0.004
Foetal complication	8.47 (2.35, 30.52)	0.001	15.28 (3.16, 73.96)	0.001

Table 19 shows that mothers with maternal, labour and foetal complications were more likely to have a fresh stillbirth as compared to those without a complication, 6.10 (OR 6.10; 95%CI 1.09, 34.14; p=0.040), 5.08 (OR 5.08; 1.17, 22.06; p=0.030) and 8.47 (OR 8.47; 95%CI 2.35, 30.52; p=0.001). The p-values of 0.013 for maternal complication and fresh stillbirths; 0.004 for labour complication and fresh stillbirths and 0.001 for foetal complications signified statistical significance.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Introduction

This chapter discusses the findings of this study in relation to other studies, presents the implications of the findings on care provision, how the information will be disseminated, the limitation of the study, and provides the recommendations.

5.1 Socio-demographic factors of the study population

5.1.1 Mothers whose records were reviewed

Majority of the mothers whose records were reviewed (70.2%) were in the age group 20-29 years; the youngest was aged 13 years and the oldest was aged 49 years (Table 5). Table 2 showed that 68.6% were married, while 31.4% were single; and 68.9% were not in any form of employment or income generating venture. This socio-economic status had the potential to interfere with most participants' decision making in seeking medical care as a result of lack of finances. Consequently, lack of finances could have led to late or inconsistent antenatal attendance resulting in late detection and management of complications, and eventually, fresh stillbirths.

Half, (50%) of the mothers who had fresh stillbirths were teenagers (Table 5). This result is in agreement with Adam's (2014) statement in a study conducted in Ghana, which stated that mothers who were 24 years or less had three folds elevated odds of stillbirths compared to mothers in the age brackets between 25 and 34 years. In agreement, 62.5% of the fresh stillbirths in this study were from primiparous mothers, while only 37.5% were from multiparous mothers (Table 5). Fresh stillbirths could be common among primiparous teenage mothers due to factors related to receiving inadequate antenatal care due to the illegality of their pregnancies. This assumption is based on the fact that none of the grand-multiparous mothers (11.4%) who were all married and hence, their pregnancies deemed to be legal had a fresh stillbirth (Table 5).

5.1.2 Midwives

Table 3 showed that 51.4% of the midwives who participated in the study were aged between 25-35 years, while those who were aged between 47-57 years were 14.3%. This gives an impression that more midwives in Livingstone district are in their youthful years, and hence, still energetic, vibrant and active.

Consequently, the data indicated that 80% had work experience ranging from 0-5 years (Table 3). The reason for the high number of youthful midwives with work experience of less than 6 years could be attributed to the much older and experienced midwives occupying managerial positions; thus, leaving the younger ones hands-on in the labour wards. Regarding qualifications; 51.4% were registered midwives, 28.6% were enrolled midwives, 17.1% were direct entry midwives, and 2.9% had BSc in Midwifery (Table 3). This could be attributed to the fact that majority of the nursing schools in Zambia have been converted to registered nursing colleges; thereby providing the professionals with the opportunity to obtain the registered midwifery qualification. Additionally, the Nursing and Midwifery Council of Zambia (NMCZ) has introduced a one year abridging programme for enrolled nurses and midwives to upgrade to registered nursing. In view of the advancements in qualifications, it is expected that women would receive better antenatal and intrapartum care; hence, reducing the incidences of fresh stillbirths.

5.2 Maternal related factors

Medical and obstetric complications in women have critical significance in determining pregnancy outcome. These include hypertensive disorders such as pre-eclampsia and eclampsia, antepartum haemorrhage, placenta praevia and many others (Fraser and Cooper, 2012). In this study, the association between the presence of a medical or obstetric complication and fresh stillbirth was statistically significant. The p-value for univariate analysis was 0.040, while the multivariate analysis was 0.013 (Table.17). This result is in agreement with a study conducted by Lawn et al. (2016), where it was found that mothers who had certain medical conditions such as placenta praevia, severe pre-eclampsia and diabetes were more likely to have fresh stillbirths. The result could be attributed to the fact that untreated medical conditions compromise foetal wellbeing by interfering with nutritional and oxygen supply to the foetus, thus, ultimately contributing to the resultant fresh stillbirth.

Similarly, the association between labour complications of obstructed labour and prolonged labour with fresh stillbirths were statistically significant. The univariate value for labour complications was 0.030 and multivariate analysis was 0.004 (Table17). Compliance to consistent use of labour monitoring tools provides an accurate record of the progress of labour; so that, any delay from normal labour can be detected early and treated promptly.

5.3 Foetal related factors

Prematurity was highly associated with fresh stillbirth with a p-value of 0.003 in the univariate analysis (Table 16). Similarly, in a study by Chuwwa et al., (2017), it was reported that prematurity and low gestational age had a significant relationship with fresh stillbirths. Nevertheless, in this study, only 16% (6) of the fresh stillbirths were preterm, while 84% (13) were born after 37 completed weeks (Figure 2). It can therefore, be argued that the fresh stillbirths in this study could have been prevented had the women received quality antenatal and intrapartum care. This is because infants born after 37 completed weeks have better chances of survival if they are provided with prescribed standard care. Additionally, it was established that cord accidents had an association with fresh stillbirths. In the multivariate analysis, the p-value (0.040) was statistically significant (Table 16). The result could be attributed to the low knowledge levels of the midwives in the management of foetal complications such as cord accidents.

5.4 Service related factors

Adequate care of women in labour entails giving of timely information, comfort, support, and reassurance, it is also important to maintain respect and courtesy (McClure, 2013). A partograph is used to monitor women in active phase of labour. Utilization gives midwives a clear picture of labour progress, foetal and maternal wellbeing. It is a decision-making aid when abnormalities are detected and designed to be used at any level of care. In this study, majority of the women were not monitored according to protocol whilst in labour. Out of the 228 files that were reviewed, 81.6% (200) showed that progress of labour was not monitored according to the set standard (Table 13). Some parameters such as level of descent and moulding of the foetal head were missed during vaginal examination.

Additionally, 83% (203) mothers were not monitored for maternal wellbeing by monitoring vital signs such as blood pressure, pulse rate, temperature and respirations in accordance with the set protocol (Table 13). Foetal heart rate was only monitored according to standard in 55.5% (136) of the files that were reviewed, while 45.5% (109) were not monitored (Table 13). Although there was no statistical significance between monitoring and fresh stillbirth, the gaps in monitoring were bothersome. The results showed that a large percentage of women did not receive care according to protocol.

Gaps in monitoring maternal and foetal wellbeing and progress of labour could have led to midwives missing cues leading to fresh stillbirths such as obstructed labour, prolonged labour or foetal distress.

Knowledge is one of the crucial aspects of healthcare systems (Faiza, 2011). Midwives have to incorporate theoretical knowledge, practical skills and also use their personal attributes, like empathy and intuition as they provide care during labour and delivery. Furthermore, the concepts of knowledge and competence are complex and include hands-on skills training, but also personal factors, such as self-efficacy, confidence and a capacity for critical thinking (Ba¨ck et al., 2016). In this study, 71.4% (25) of the respondents had low knowledge levels, while 5.7 and 22.9% had high and medium knowledge levels respectively. This could explain why there were high numbers of fresh stillbirths in Livingstone, because poor knowledge level, may lead to failure to recognize critical cues that may lead to fresh stillbirths. It is therefore imperative that the management teams in Livingstone embark on facilitating in-house training for all midwives in order to reduce the numbers of fresh stillbirths. Midwifery schools must also use this data to check how the curriculum can be revised to ensure midwives gain and retain enough knowledge after completion of training.

In this study, 62.9% (22) of the midwives disagreed to having adequate staffing in the labour wards (Table 4). Lawn et al. (2011) in their study also reported that adequate staffing in labour ward could reduce adverse events and unreported 'near misses', which were attributed to midwifery shortages. However, it could also be assumed that inadequate monitoring of women in labour could be an aspect of poor attitude among midwives, therefore missing out critical signals that could give an alert that the foetus was at risk of a mishap such as a foetal distress. A multicentre study on maternal mortality in selected health facilities in Zambia revealed that some midwives were observed completing partographs after women had given birth (Kwaleyela et al., 2020). Adequate numbers of competent, well trained midwives with appropriate skills mix that are able to provide quality maternity care are a necessity during antenatal and intrapartum periods. Midwives that worked in facilities that were well staffed were able to accurately monitor labour progress and conduct quality deliveries; thus, they prevented fresh stillbirths (Lawn et al., 2011). However, although staffing levels are important, other factors such as experience of available midwives, poorly organised midwifery teams, and midwives performing clerical assignments which take them away from clinical work may contribute to high numbers of fresh stillbirths.

Training in EmONC and HBB are some of the important trainings that enhance skills and knowledge for midwives in order to provide quality care in labour and save the lives of mothers and babies. In this study, 80% (28) of the midwives were not trained in both EmONC and HBB (Table 4). Most healthcare providers had several barriers to implementing recommended practice because they were unaware of current recommended effective practices due to lack of knowledge on management of complications which may arise during labour and delivery owing to lack of updates and continuous professional development as illustrated in Table 4.

Availability of basic and adequate equipment for labour and childbirth in sufficient quantities are a prerequisite to good labour outcomes. It is assumed that lack of equipment for labour monitoring lead to missing vital indicators for complications such as foetal distress and prolonged labour (Haws et al., 2009). In this study, 60% (21) of the midwives stated that although necessary equipment required in labour ward for provision of quality intrapartum care was available, it was not adequate. Ultimately, infrastructure limitations, technical maintenance of equipment and medical supplies shortages were reported as obstacles to perinatal care, and affected the provision of quality midwifery and obstetric care.

5.5 Implication of findings to care provision

5.5.1 Midwifery practice

The findings revealed that the relationship between fresh stillbirth and foetal and maternal complications were statistically significant. This finding implied that women were not receiving comprehensive care during antenatal, labour and delivery periods. Midwives need to be adequately equipped in order for them to recognise and manage maternal complications timely and as per the recommended standards of care prescribed by the WHO set standards to prevent fresh stillbirths. The study also revealed that 80% of the midwives were not trained in EmONC and HBB; hence, they were not able to offer expected quality of care due to inadequate knowledge and skill. The results also showed that the relationship between cord accident and fresh stillbirths was statistically significant. Cord accident management requires knowledge and expertise embedded in the EmONC and HBB training.

5.5.2 Midwifery education

Midwifery education plays a pivotal role in moulding midwives who are capable of providing quality comprehensive midwifery care. The study revealed that 71.4% of the midwives had low knowledge on predisposing factors to fresh stillbirths. A midwife who has not received adequate training in EmONC and HBB is less likely to adhere to the guidelines because of lack of knowledge and competences. It is therefore imperative for midwifery educators to teach, mentor and emphasise the importance of adhering to protocols during the training of students. Midwifery educators should put emphasis on management of complicated conditions in pregnancy, labour and delivery during training so that midwives are adequately equipped to manage complications at the time that they are graduating. The emphasis in the current midwifery curriculum is on management of normal labour and delivery (NMCZ, 2015). However, when midwives qualify, they are faced with challenging complications which they might fail to handle.

5.5.3 Research

Despite measures put in place to reduce fresh stillbirths, the numbers are still very high in Zambia. Additionally, inadequate research has been conducted on the topic; hence, making it difficult to come up with interventions that are evidence based. Therefore, more research on the fresh stillbirth phenomenon is recommended.

5.5.4 Management

The study revealed that the partograph was not adequately utilised during labour monitoring; 53% of the reviewed files revealed non-adherence to standards of intrapartum care. This finding could be attributed to inadequate staffing as well as inefficient technical support, supervision and mentorship from senior midwives holding managerial positions. Midwifery managers are required to monitor the practice of midwives during their day to day provision of antepartum and intrapartum care. This would improve knowledge and competences among midwives working in the clinical areas. Managers should also ensure that maternity units, in particular, labour wards are adequately staffed in order to prevent a compromise on standard care and burn out among midwives.

5.6 Recommendations

5.6.1 Ministry of Health

Based on the findings of this study, it is recommended that the MoH should ensure that adequate resources including human, equipment and various supplies required to provide quality intrapartum care are provided in all maternity health facilities. This could be achieved by increasing grant allocations to District Health Offices (DHOs) and hospitals for enhancement of in-house trainings for midwives in EmONC and HBB as well as servicing of hospital equipment and purchase of those that are obsolete. Additionally, MoH should consider training and employing more midwives in order to improve the midwife to woman ratio in labour wards.

5.6.2 Hospital and District Health Office

Hospital and DHO management teams should include in-house trainings for midwives on labour monitoring, use of a partograph and management of maternal, labour and foetal complications in their strategic plans. Delivery centres should be provided with appropriate equipment and surgical/medical supplies required for provision of quality intrapartum care. Furthermore, managers and supervisors should ensure that protocols and guidelines on intrapartum care are displayed in labour wards for ease reference by midwives, as well as conduct regular technical support and supervision to midwives working in the maternity wards.

5.6.3 Nursing and Midwifery Council of Zambia (NMCZ)

The NMCZ should enhance inspection of midwifery training and practice institutions in the country to reinforce compliance with set standards of intrapartum care. It should also ensure the dissemination of protocols on management of various complications that may compromise maternal and foetal wellbeing.

5.7 Dissemination of Findings

Bound copies of this study will be submitted to the University of Zambia, School of Nursing Science, MoH, Livingstone District Health Team and Livingstone Central Hospital. The findings of the study will also be published in a peer reviewed journal and presented at international and national conferences.

5.8 Limitations of the Study

The study was conducted at Livingstone Central Hospital and selected facilities in the Livingstone district; therefore, generalisation of the findings should be done with caution because of contextual differences.

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APPENDICES

APPENDIX I: PARTICIPANT INFORMATION SHEET

TITLE OF THE STUDY: FACTORS ASSOCIATED WITH FRESH STILLBIRTHS, LIVINGSTONE, ZAMBIA

PURPOSE OF THE STUDY

The purpose of this study is to determine the factors associated with fresh stillbirths in Livingstone. The information obtained from the study will help policy makers to develop strategies that will help in service delivery hence reduce the numbers of fresh stillbirths.

DESCRIPTION OF THE STUDY AND MY INVOLVEMENT

The study will use a questionnaire to obtain information. After signing the consent, a questionnaire will be given to you and you will be required to write answers to the questions. The researcher will distribute the questionnaires, ensure that they are completely filled in and collect them for data analysis.

CONFIDENTIALITY

The results of all the study will be kept confidential. All information obtained in this study will be considered confidential and used only for research purposes. No one will be allowed to access any information related to what you have answered. All details will be recorded on a form, kept secure and no name will be included only the study number.

VOLUNTARY PARTICIPATION AND WITHDRAWAL

The participation in the study is entirely voluntary, and you are free to refuse or withdraw at any time without suffering any consequences. If you decide to participate in this study you will be asked to sign a consent form, however, you are still free to withdraw at any time without having to give a reason.

RISKS AND BENEFITS

There is no direct benefit for participants but your participation will ensure help in identifying service related factors associated with fresh stillbirths. The information that will be obtained will help answer the research question and enable development of measures that will benefit the future generation.

CONTACTS FOR QUESTIONS

Ruth Zulu Nambala

Postgraduate Department, University of Zambia School of Nursing Sciences, UTH, Nationalist Rd P.O. BOX 50110,

Lusaka, Zambia

Mobile No: +26 0977 879147/ +26 0762 751547

Email: ruthnambala73@gmail.com

Dr. Jason Mwanza

Chairperson, Humanities and Social Sciences, Research ethics committee,

University of Zambia,

P O Box 32379,

 Lusaka.

Dr, Henry Sichingabula

Director, Directorate of Research and Graduate Studies,

University of Zambia,

P O Box 32379,

Lusaka.

APPENDIX 2: INFORMED CONSENT FORM

Study Title: Factors associated with Fresh Stillbirths in Livingstone, Zambia

I confirm that I have read and fully understood the information I have been presented with about the whole study. I agree to participate in the study and I confirm that it is out of my free will without being influenced to participate in the study. I can withdraw from the study at any time I feel like without affecting my rights of medical care available to me. I understand what will be required of my participation.

Name: …………………………………………………

Signed (or thumbprint) ………………………………….

Date: ………………………………………………….

Signature (or thumbprint) of witness ……………………

Name: ………………………………………………..

Date: ………………………………………………….

I, the member of the study team, I confirm that I have explained the information fully and answered any questions

Signed for the study team

Name: ………………………………………………….

Date:………………………………………………….

APPENDIX 3: SEMI-STRUCTURED SELF ADMINISTERED QUESTIONAIRRE

UNIVERSITY OF ZAMBIA

SCHOOL OF NURSING SCIENCES

DEPARTMENT OF MIDWIFERY AND WOMEN'S HEALTH

TITLE: FACTORS ASSOCIATED WITH FRESH STILLBIRTHS IN LIVINGSTONE, ZAMBIA

DATE: ……………………………………   **SERIAL NO:…………………………….**

Place of Data Collection………………………….

INSTRUCTION TO THE RESPONDENTS

Do not **WRITE** your name on the questionnaire, **ONLY** serial no. is required exclusively for comparison

Put (X) on all appropriate response to the question

Attempt all the questions in all the five (5) sections

All information provided will be kept confidential

Service Related Factors

SECTION A: Knowledge of Midwives on fresh stillbirths

Please fill in the blanks and place an (X) next to the correct response.

Demographic data

1) Age at last birthday: ....

2) Years of experience

1. 0-5

2. 6-10

3. 11-20

4. Above 20

3) Qualification:

1. Advanced Nurse Practitioner

2. BSc in Nursing

3. Registered Midwife

4. Enrolled Midwife

5) ( ) Certified Midwife

Knowledge questions

4. Have you ever heard about respectful maternity care (RMC)?   (1) Yes ( )   No ( )

If yes, explain what RMC is.

5. Duration of the latent first stage has not been established and can vary widely from one woman to another   True ( )   False ( ).

6. Duration of active first stage (from 5 cm until full cervical dilatation) usually does not extend beyond 12 hours in first labours, and usually does not extend beyond 10 hours in subsequent labours   True ( )   False ( ).

7. Use of medical interventions to accelerate labour and birth (such as oxytocin augmentation or caesarean section) before a cervical dilatation of 5cm threshold is not recommended, provided foetal and maternal conditions are reassuring.   True ( ) False ( )

8. Is it necessary to do auscultation using a Doppler ultrasound device or Pinard foetal stethoscope quarter hourly for the assessment of fetal wellbeing on women in active phase of labour?   Yes ( )   No ( )

9. What is the normal range for foetal heart rate?

....(1)

10. How often are contractions done in a woman in active phase labour...
....

11. Digital vaginal examination at intervals of four hours is recommended for routine assessment of active first stage of labour in low-risk women True ( )   False ( )

12. Should low risk women be allowed to take women oral fluid and food intake during labour? Yes ( )   No ( )

13. Mention two labour complications that can lead to fresh stillbirths?

....

....

14. Do you encourage the adoption of mobility and an upright position during labour in women at low risk? Yes ( ) No ( )

15. Parenteral Opiods, such as Fentanyl, Diamorphine and Pethidine, are recommended options for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.   True ( )   False ( )

Mention two foetal conditions that may lead to fresh stillbirths.

16...

17...

Mention two maternal conditions that may lead to fresh stillbirths.

 18..

19..

20. The use of early amniotomy with early oxytocin augmentation for prevention of delay in labour is recommended 1. Yes ( ) 2. ( )

B: CHECKLISTS FOR THE HEALTH FACILITY RESOURCES

Infrastructure Enhanced physical environment:

21. Clean, appropriately illuminated, well ventilated labour, childbirth and neonatal areas that allow for privacy and are adequately equipped and maintained 1. Yes ( ) 2. No ( ).

22. Continuous electricity supply in the labour, childbirth and neonatal areas 1. Yes ( ) 2. No

23. Clean and accessible bathrooms for use by women in labour 1. Yes ( ) 2. No ( ).

24. Safe drinking water, and a hand hygiene station, with soap or alcohol-based hand rubs 1. Yes ( ) 2. No ( )

25. Curtains, screens, partitions and sufficient bed capacity 1. Yes ( ) 2. No ( ).

26. Facilities for labour companions including physical private space for the woman and her companion 1. Yes ( ) 2. No ( )

27. On-site pharmacy and a medicine and supplies stock management system that is managed by a trained pharmacist or dispenser 1.Yes ( ) 2. No ( ).

Staffing

28. Adequate numbers of midwives 1) Yes ( ) 2) No ( ).

29. Trained, supervised skilled birth attendants with an appropriate skills mix, working in multidisciplinary teams that are able to provide dignified and continuous care to all women 1.Yes ( ) 2. No ( ).

Supplies

30. Written, up-to-date standards and benchmarks that outline clear goals, operational plans and monitoring mechanisms for RMC 1. Yes ( ) 2. No ( )

31. Provisions for staff in labour ward, e.g. refreshments 1. Yes ( ) 2. No ( ).

32. Health education materials, in an accessible written or pictorial format and available in the languages of the communities served by the health care facility 1.Yes ( ) 2. No ( ).

33. A standard informed consent form Information (written or pictorial, e.g. as leaflets for the woman and her companion 1.Yes ( ) 2. No ( ).

34. Essential medicines for labour and childbirth care available in sufficient quantities at all times in the labour ward 1. Yes ( ) 2. No ( ).

Section D: In- service training

35. Are healthcare providers sensitized and oriented to RMC, and trained to develop and apply RMC policies 1) Yes ( ) 2) No ( ).

36. In-service training on emergency management of neonatal and obstetric complications and help baby breath 1) Yes ( ) 2) No ( ).

37. Support for all clinical staff who provide care for women in labour to have regular supportive supervision and review by labour/facility lead with positive clinician support 1. Yes ( ) 2. No ( ).

38. Regular multidisciplinary meetings to discuss and review maternal and neonatal morbidity and mortality 1. Yes ( ) 2. No ( ).

Equipment

Does the labour ward have basic and adequate equipment for labour and childbirth available in sufficient quantities at all times in the labour ward: mark a tick if available and a cross if not available.

39. Thermometers 1. Yes (   ) 2. No (   )

40. Blood pressure machines 1. Yes (   ) 2. No (   )

41. Resuscitaires1. Yes (   ) 2. No (   )

42. Pinard foetal stethoscope 1. Yes (   ) 2. No (   )

43. Doppler machines 1.Yes (   ) 2. No (   )

44. Cardio topography machines 1. Yes (   ) 2. No (   )

45. Weighing scales for mother and baby 1. Yes ( ) 2. ( )

THANK YOU FOR YOUR PARTICIPATION

APPENDIX 4: MARKING KEY FOR STUDY VARIABLES

SECTION B: KNOWLEDGE ON FRESH STILLBIRTHS			
QUESTION NUMBER	QUESTION	CORRECT ANSWER	MAXMUM SCORE
4	Have you ever heard about respectful maternity care (RMC)? If yes explain what RMC is.	Yes RMC refers to care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth	5
5	Duration of the latent first stage has not been established and can vary widely from one woman to another	True	1
6	Duration of active first stage (from 5 cm until full cervical dilatation) usually does not extend beyond 12 hours in first labours, and usually does not extend beyond 10 hours in subsequent labours	True	2
7	Use of medical interventions to accelerate labour and birth (such as oxytocin augmentation or caesarean section) before a cervical dilatation of 5cm threshold is not recommended, provided foetal and maternal conditions are reassuring.	True	1
8	Is it necessary to do auscultation using a Doppler ultrasound device or Pinard foetal stethoscope quarter hourly for the	No	1

	assessment of fetal wellbeing on women in active phase of labour?		
9	What is the normal range for foetal heart rate?	120-160 beats per minute.	2
10	How often contractions are are done in a woman in active labour.	Half hourly	1
11	Digital vaginal examination at intervals of four hours is recommended for routine assessment of active first stage of labour in low-risk women	True	1
12	Should low risk women be allowed to take women oral fluid and food intake during labour?	Yes	1
13	Mention two labour complications that can lead to fresh stillbirths?	Obstructed labour, Prolonged labour, breech presentation, shoulder dystocia, intrapartum haemorrhage	2
14	Do you encourage the adoption of mobility and an upright position during labour in women at low risk?	Yes	1
15	Parenteral Opiods, such as Fentanyl, Diamorphine and Pethidine, are recommended options for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.	Yes	1

16	Mention two foetal conditions that may lead to fresh stillbirths.	Birth defects, cord accidents, prematurity,	2
17	What two maternal conditions may lead to fresh stillbirths?	Diabetes mellitus, hypertensive disorders, anemia, epilepsy	2
18	The use of early amniotomy with early oxytocin augmentation for prevention of delay in labour is recommended	False	1
19	Application of manual fundal pressure to facilitate childbirth during the second stage of labour is recommended.	False	1

APPENDIX 5: CHECKLIST FOR REVIEW OF RECORDS

Maternal related factors

1. Maternal age (years) at delivery.

....

2. Marital status of the woman.

1) Married   2) Single   3) Divorce   4) widow

3. Residential area of the mother.

1) Urban   2) Rural

4. Parity

....

5. Educational level of the mother.

1) No formal education 2) Primary 3) Secondary 4) Tertiary

6. Occupation of the mother.

1) No work   2) Farming   3) Trade   4) Formal (Public and other sectors)

PRESENCE OF COMPLICATIONS

7. Chronic hypertension Yes (   ) 2) No (   )

8. Pre- Eclampsia Yes (   ) No (   )

9. Eclampsia Yes (   ) 2) No (   )

10. Diabetes Mellitus Yes (   ) 2) No (   )

11. Prolonged labour1) Yes (   ) 2) No (   )

12. Obstructed labour 1) Yes (   ) 2) No (   )

Foetal related Factors

13. Presence of cord accidents

1) Yes 2) No

14. Gestation of pregnancy (in completed weeks relative to last menstrual period as recorded in Maternal Health Record book or maternity notes). ………………………..

1) 37 or equal to 37 completed weeks 2) Less than 37 weeks

15. Foetal distress 1) Yes (   ) 2) No (   )

16. Prematurity 1) Yes (   ) 2) No (   )

Service Related Factors

Utilization of the partograph

17. Condition of membranes noted during vaginal examination 1) Yes (   ) 2) No (   )

18. If membranes ruptured, was condition of liquor noted and recorded 1) Yes (   ) 2) (   )

19. Moulding noted and recorded on vaginal examination 1) Yes (   ) 2) No (   )

20. Fetal heart rate every thirty minutes 1) Yes (   ) 2) No (   )

21. Contraction observation every thirty minutes 1) Yes (   ) 2) No (   )

22. Maternal blood pressure every two hours 1) Yes (   ) 2)No (   )

23. Maternal temperature every four hours 1) Yes (   ) 2) No (   )

24. Maternal pulse every thirty minutes 1) Yes (   ) 2) No (   )

25. Vaginal examination every four hours 1) Yes (   ) 2) No (   )

26. Station noted on every vaginal examination   1) Yes (   ) 2) No (   )

27. Urine output recorded and glucose and acetone levels checked every time the woman passed urine 1) Yes ( ) 2) No ( )

Birth outcome

28. Baby delivered as

1) Fresh stillbirth 2) Macerated stillbirth 3) Live birth

APPENDIX 6: BUDGET

ITEM	UNIT COST	UNIT	TOTAL COST
STATIONARY			
Note Books	K10.00	4	K40.00
Reams of Paper	K70.00	2	K140.00
Pens	K2.00	10	K20.00
Erasers	K1.00	4	K4.00
Tipex	K20.00	2	K40.00
Stapler	K30.00	1	K30.00
Perforator	K75.00	1	K75.00
Manila Paper	K4.00	4	K16.00
Diary	K35.00	4	K140.00
Pins	K1.00	50	K50.00
Scientific Calculator	K90.00	1	K90.00
Flip Charts	K20.00	3	K60.00
Markers	K12.00	2	K24.00
Staples	K30.00	1 box	K30.00
Box File	K30.00	1	K30.00
Small Folder	K2.00	10	K20.00
Field Bag	K150.00	4	K600.00
Memory Sticks	K50.00	2	K100.00
SUBTOTAL			K1,479.00
SECRETARIAL MATERIAL			
Questionnaire Typing	K2.00	7 pages	K14.00
Research Proposal Typing And Binding	K8.00	60 pages	K140.00
Questionnaire Printing	7x3	174	K550.00
Research Report Writing	60pagesx3	1	K180.00
Photocopying of Final Research Document	300 x 60 pages	6	K108.00
Binding Of Research Document	80	6	K480.00
SUBTOTAL			**K1, 472.00**
HUMAN RESOURCE EXPENSES			
Transport During Pilot Study	40x4 people	x 4days	K1120.00
Transport During Data Collection	20x4 people	X30 days	K2400.00
SUBTOTAL			**K3,520.00**
INFORMATION DESSEMINATION			
Hall Hire For Dissemination	K200.00	1 day	K200.00
LCD Hire	K500.00	1 day	K500.00
Refreshments	K20.00	25	K30.00
SUBTOTAL			**K730.00**
TOTAL			**K7, 200**
CONTINGENCY 10%			K720.00
GRAND TOTAL			**K7,920**

Budget Justification

This research proposal budget has taken into consideration the aspects of stationary, human resource expenses, secretarial services and contingency.

Stationary

Stationary will be very much needed to carry out this research successfully. That is needed for instance reams of paper for the formulation, amendments and production of pilot study questionnaires which are not included under the costs for the final questionnaires. Documents such as questionnaires need to be printed.

Secretarial Material

For the researcher to successfully carry out the research, they will be need of materials to be procured such as reams of paper, as well as typing of the research findings, photocopying and binding at the prevailing rates in the area as shown in the budget.

Human Resource Expenses

In order to enable the researcher move from point of residence to points where data will be collected during pilot study and final collection of data, fuel will be needed for a taxi which will be used.

Information Dissemination

At the end of the research the findings will need to be presented to stakeholders; Livingstone Central hospital and Ministry of health.

Contingency Fund

This is 10 percent of the total budget which has been added to cover for unforeseen expenses and to cushion inflation that might occur during the research study.

APPENDIX 7: Gantt Chart

YEAR	2019												2020						
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FFB	MAR	APR	MAY	JUN	JUL
Development of research proposal	▉	▉	▉																
Finalize Research Proposal				▉	▉	▉													
Submission of Research proposal for ethical review/approval.							▉												
Clearance from authority								▉											
Pilot study									▉										
Data collection										▉	▉	▉							
Data analysis													▉	▉	▉				
Report writing																▉			
Submission of draft report																	▉		
Finalization of report																		▉	▉
Dissemination of results																			▉

APPENDIX 8

UNIVERSITY OF ZAMBIA
BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067	Ridgeway Campus
Telegrams: UNZA, LUSAKA	P.O. Box 50110
Telex: UNZALU ZA 44370	Lusaka, Zambia
Fax: + 260-1-250753	E-mail: unzarec@unza.zm
Federal Assurance No. FWA00000338	IRB00001131 of IORG0000774

30th July, 2019.

<div align="center">REF. No. 098-2019</div>

Ms. Ruth Nambala Zulu,
University of Zambia,
Department of Nursing Sciences,
P.O Box 50110,
Lusaka.

Dear Ms. Nambala Zulu,

RE: "FACTORS ASSOCIATED WITH FRESH STILL BIRTHS: A CASE STUDY OF
   LIVINGSTONE CENTRAL HOSPITAL, LIVINGSTONE, ZAMBIA"
   (Ref. No. 098-2019)

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 29th July, 2019. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

a)   **Study proposal**
b)   **Questionnaires**
c)   **Participant Consent Form**

      APPROVAL NUMBER   **: REF. 098-2019**

 This number should be used on all correspondence, consent forms and documents as appropriate.

- **APPROVAL DATE**   : 29th July 2019
- **TYPE OF APPROVAL**   : Standard
- **EXPIRATION DATE OF APPROVAL**   : 28th July 2020
   After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING:** All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.
- **MODIFICATIONS:** Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY:** On termination of a study, a report has to be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.

APPENDIX 9

NATIONAL HEALTH RESEARCH AUTHORITY
Paediatric Centre of Excellence, University Teaching Hospital, P.O. Box 30075, LUSAKA
Tell: +260211 250309 | Email: znhrasec@gmail.com | www.nhra.org.zm

Ref No:...............................   Date: 26ᵗʰ August, 2019

The Principal Investigator
Ms. Ruth Nambala Zulu
University of Zambia
School of Nursing Sciences
PO Box 50110,
LUSAKA

Dear Ms. Nambala Zulu,

Re: Request for Authority to Conduct Research

The National Health Research Authority is in receipt of your request for authority to conduct research titled "Factors Associated with Fresh Still Births: A Case Study of Livingstone Central Hospital, Livingstone, Zambia." I wish to inform you that following submission of your request to the Authority, our review of the same and in view of the ethical clearance, this study has been **approved** on condition that:

1. The relevant Provincial and District Medical Officers where the study is being conducted are fully appraised;
2. Progress updates are provided to NHRA quarterly from the date of commencement of the study;
3. The final study report is cleared by the NHRA before any publication or dissemination within or outside the country;
4. After clearance for publication or dissemination by the NHRA, the final study report is shared with all relevant Provincial and District Directors of Health where the study was being conducted, University leadership, and all key respondents.

Yours sincerely,

Dr. Godfrey Biemba
Director/CEO
National Health Research Authority

All correspondences should be addressed to the Director/CEO National Health Research Authority

Appendix 10

University of Zambia.
Department of Nursing Sciences.
P.O. Box 50110,
Lusaka.

Granted
Report to SMS LCH
& appraise his office on
all your find-JS

The Provincial Medical Officer,

Southern province.

P.O Box .

Choma.

Dear Sir/Madam.
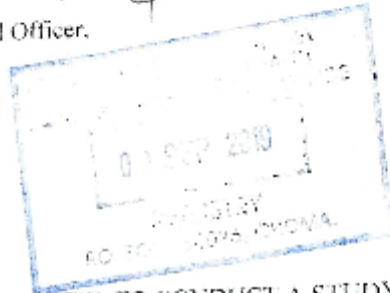
REF: REQUEST TO CONDUCT A STUDY

I hereby write to request for permission to conduct a study for academic purposes. I'm a second year student pursuing Master of Science (MSc) degree in Midwifery and Women's health with the University of Zambia under the School of Nursing Sciences. Conducting a study is one of the prerequisites needed to graduate with a Master of Science degree, I'm therefore seeking for permission to conduct a study entitled "Factors associated with fresh stillbirths: A study of Livingstone Central Hospital, Livingstone, Zambia.

Attached herewith are the following documents: clearance letter from the school, copy of the proposal and the approval letter from university of Zambia Biomedical Research Ethics Committee.

I hope my request will be granted and I thank you in advance.

Yours faithfully,

Ruth Zulu Nambala.

All correspondence should be addressed
to the Senior Medical Superintendent.
Tel/Fax: 0213 321 355
P.O. Box 60091, Livingstone, Zambia.

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
LIVINGSTONE CENTRAL HOSPITAL

26th August, 2019

Ms. Ruth Nambala Zulu (MSc)
University of Zambia
Department of Nursing Science
P O Box 50110
LUSAKA

Dear Sir/Madam,

RE: **PERMISSION TO CONDUCT A RESEARCH STUDY**

Reference is made to your request for permission to carry out a research study titled **"FACTORS ASSOCIATED WITH FRESH STILL BIRTHS"**.

I am pleased to inform you that your request has been favourably considered. We are confident that any data you collect will be kept confidential and secure. The data should be strictly used only for the purpose of fulfilling your academic obligations. In addition, we request that you provide us a copy of the aggregate results from this study.
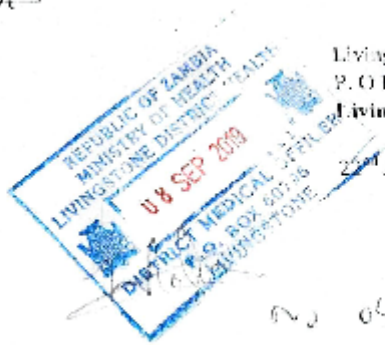
Yours faithfully,

Dr. J. S. Kachimba
Senior Medical Superintendent

Cc. File

17-09-2019

Ag PNO - FYA

The District Director of Health,
Livingstone District,
P. O. Box ,
Livingstone.

Livingstone Central Hospital,
P. O Box 60091,
Livingstone.

22nd August, 2019.

Dear Sir,

REF: REQUEST TO CONDUCT STUDY

I hereby write to your office to request for permission to conduct a study at Livingstone ~~Central Hospital~~ on "Factors associated with fresh stillbirths. I'm a student from the University of Zambia in my second year and a study is one of the pre-requisites required to qualify with a Masters Degree in midwifery.

Attached herewith is the approval letter from University of Zambia medical research ethics committee and the proposal of the study. I hope my request will be granted and I thank you in advance.

Yours faithfully,

Ruth Zulu Nambala