

**FACTORS ASSOCIATED WITH POSTNATAL CARE SERVICE
UTILIZATION AMONG MOTHERS IN ZAMBIA; A CROSS
SECTIONAL STUDY BASED ON THE 2013-14 ZAMBIA
DEMOGRAPHIC AND HEALTH SURVEY**

By

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**Dissertation submitted to the University of Zambia in partial
fulfilment of Master of Science in Epidemiology Degree**

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DECLARATION

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Signature

Date

CERTIFICATE OF APPROVAL

The University of Zambia approves this dissertation of **Charles Chungu** in partial fulfilment of the requirements for the award of the degree of Master of Science in Epidemiology.

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ABSTRACT

Zambia has reported an increase in the proportion of women accessing the postnatal care in the first two days following the delivery of the baby. The factors associated with the utilization of this service are documented in various studies worldwide. In Zambia, however, there is insufficient information on the factors influencing maternal postnatal care service utilization. This study aimed at evaluating the factors influencing the maternal postnatal care service utilization in the first forty-eight hours following the delivery of the baby.

The analysis was based on the 2013-14 Zambia Demographic and Health Survey (ZDHS) Data. The ZDHS has nationally representative data. The information was collected through face-to-face interviews of men and women as well as syphilis and HIV testing results. The 2013-14 ZDHS sampled 16,411 women age 15-49 years. This study focused on women who had a child within the two years preceding the study. To analyse the factors associated with maternal postnatal care utilization factors, chi-square testing and multiple logistic regression models were used.

From the sample of 5,074 women who met the inclusion criteria, 82.4 per cent were between 15 and 34 years inclusive. Respondents who lived in the rural area represented 66.3 per cent of the sample. Seventy-two per cent delivered in a health facility. Married respondents represented 80.4 percent of the sample. Approximately 63.4 per cent of women had postnatal care in the first 48 hours after delivery of the baby. Women not delivering in a health facility were 87 per cent less likely to utilize postnatal care (aOR 0.13: 95% CI 0.90-0.20), those attended to by skilled personnel (aOR 2.32: 95% CI 1.58-3.38) were two times more likely, women in rural areas (aOR 0.60: 95% CI 0.47-0.77) were 40 per cent less likely and those who were told about pregnancy complications (aOR 1.44: 95% CI 1.08-1.93) were more likely to utilize postnatal care within 48 hours after delivery in Zambia.

This study found out that place of delivery, skilled birth attendance, place of residence and being told about pregnancy complications were factors associated with maternal postnatal care utilization within the first 48 hours after delivery in Zambia.

Keywords: postnatal care service utilization, maternal, community factors, intermediate factors, proximate factors, Zambia.

DEDICATION

This dissertation is dedicated to my lovely wife Sylvia, a constant support, whose patience remained resolute during my course of study. My children Joshua, Favour and Emmanuel who are my motivation and inspiration. My family, Mum and Dad and all those I have not mentioned.

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ABBREVIATIONS

ANC	Antenatal Care
CP	Cooperating Partners
CPH	Census for Population and Housing
DHS	Demographic and Health Survey
HIV	Human Immunodeficiency Virus
MCDMCH	Ministry of Community Development, Mother and Child Health
MoH	Ministry of Health
MMR	Maternal Mortality Rate
NDHS	Nepal Demographic and Health Survey
NHSP	National Health Strategic Plan, 2011-2015
PNC	Postnatal Care
SEAs	Standard Enumeration Areas
SDGs	Sustainable Development Goals
SMAGs	Safe Motherhood Action Groups
WHO	World Health Organisation
ZDHS	Zambia Demographic and Health Survey

CHAPTER ONE

INTRODUCTION

1.1 Background

Postnatal care is critical to the survival of both the mother and her new-born baby. According to World Health Organisation (WHO), of the 289,000 maternal deaths that occur each year, worldwide (WHO, 2014), 50 percent to 71 percent occur within the postnatal period (Workineh and Hailu, 2014). On the other hand, 2.9 million neonatal deaths occur in the first week of life on an annual basis globally (Lawn et al., 2014). Unfortunately, 99 percent of these maternal and neonatal deaths occur in low and middle income countries (Blencowe et al., 2012) to which Zambia belongs. According to the 2013-14 Zambia Demographic and Health Survey (ZDHS), Zambia had a maternal mortality rate (MMR) of 398 maternal deaths per 100,000 live births (CSO, 2014).

Postnatal care is the service provided to both the mother and her newborn baby within the first six weeks of birth (WHO, 2014). The service includes; an integrated package of routine maternal and neonatal care as well as extra care for neonates that are considered particularly vulnerable because, for example, they are preterm, have a low birth weight, are small for gestational age or have mothers infected with human immunodeficiency virus (HIV) (Kerber et al., 2007). Possible postnatal interventions for the mother include: (i) iron and folic acid supplementation for at least three months; (ii) screening for – and treatment of – infection, haemorrhage, thromboembolism, postnatal depression and other conditions; (iii) prophylactic antibiotics given to women who have a third or fourth-degree perineal tear; and (iv) counselling on early and exclusive breastfeeding, nutrition, birth spacing and family planning options – including any available contraception (Lawn et al., 2010).

Possible interventions for the neonate include: care of the umbilical cord; special care for preterm, low-birth-weight and HIV-infected neonates (Kerber et al., 2007); screening and treatment of infections and postnatal growth restriction; assessment of factors predisposing to infant anaemia (Crawley, 2004) and teaching the mother to seek additional care for her neonate if she notices danger signs such as convulsions or problems with feeding (WHO, 2014).

In Zambia, the postnatal care is scheduled as recommended by the Ministry of Health (2011) and as cited by Central Statistical Office (2014) into; within the first six hours after birth, within 48 hours, after six days and then finally within the last six weeks after the birth of the baby. The government of Zambia is committed to providing the service to all women after childbirth at no cost. Despite the importance of postnatal care service, its coverage tends to be poor (Fort, 2012). For example, in a recently conducted review of Demographic and Health Surveys from 13 African countries, of those who deliver at home only 13 percent received postnatal care services (Warren et al, 2006).

In Zambia, postnatal care coverage within the first two days has been estimated to be at 63 percent, which is below the national minimum target of 80 percent (MCDMCH and MoH, 2013; CSO, 2014). In an effort to improve the coverage, the Government of the Republic of Zambia through the MoH, the then Ministry of Community Development, Mother and Child Health (MCDMCH) and its Cooperating Partners have been implementing various strategies and interventions such as; strengthening facility referral system and infrastructure rehabilitation and constructions (Mother's waiting homes and delivery rooms), and increasing demand especially for initial and continuous utilization of postnatal care services, by implementing behaviour change communication, addressing myths and misconceptions about postnatal period and care through Safe Motherhood Action Groups (SMAGs) among other activities (MCDMCH and MoH, 2013).

The interventions put in place by the Ministry of Health in Zambia to increase uptake of postnatal care services by mothers seem to have yielded some significant improvement in PNC coverage. In the 2007 ZDHS, the postnatal care service coverage in the first 48 hours was estimated to be 39 percent (CSO, 2009) which later increased to the current 63 percent (CSO, 2014), however, the current coverage is still below the minimum target of 80 percent. For the policy makers to design, justify and implement additional and appropriate interventions which would contribute to further improvement in coverage, knowledge of the factors associated with utilization of postnatal care services is important (Khanal et al., 2014).

1.2 Problem Statement

It is estimated that only 63 percent of mothers utilize postnatal care services within the first 48 hours in Zambia, as reported in the 2013-14 ZDHS (CSO, 2014), against a national minimum target of 80 percent (MCDMCH and MoH, 2013). This maternal postnatal care utilization coverage is low and poses a serious drawback to the reduction of maternal and neonatal morbidity and mortality considering the fact that 50 percent of maternal deaths and 40 percent neonatal deaths occur within the first 24 hours after child birth (Ronsmans et al., 2006). Understanding the factors associated to maternal postnatal care utilization in the first 48 hours after birth in Zambia would be important to influence the improvement in the coverage of maternal postnatal care utilization and consequently the reduction of maternal deaths.

1.3 Justification of the study

There seems to be insufficient information of studies done using Demographic and Health Survey in Zambia on associated factors to maternal postnatal care service utilization within the first 48 hours after the birth of a baby. Although, few studies done have looked at factors associated with low postnatal care utilization for example in unpublished studies in Nchelenge and Mazabuka, in Zambia by Chisha (1997) and Jacobs (2007) respectively, there seems to be no evidence of any study on factors associated with maternal postnatal care utilization within the first two days at national level. The purpose of this study was to analyse and discuss factors associated with maternal postnatal care service utilization within the first 48 hours after birth in Zambia using the 2013-14 ZDHS data, a nationally representative data. The understanding of factors that influence postnatal care utilization in the first 48 hours is critical for possible consideration in policy formulation and practice to improve the coverage of this service.

1.4 Research Objectives

1.4.1 General Objective:

To evaluate factors associated with maternal postnatal care service utilization in Zambia using the 2013-14 Zambia Demographic and Health Survey.

1.4.2 Specific Objectives:

1. Evaluate community (distal) factors associated with PNC service utilization within the first 48 hours after birth.

2. Evaluate intermediate factors associated to PNC service utilization within 48 hours after birth.
3. Assess proximate factors associated with PNC service utilization within 48 hours after birth.

1.5 Research Question

What are the factors associated with maternal postnatal care service utilization within the first 48 hours in Zambia?

1.6 Conceptual Framework

This study used an adapted conceptual framework used by Khanal et al (2014) in the analysis of factors associated with postnatal care service utilization in Nepal and by a study in Indonesia by Titaley et al (2012). These studies adopted the conceptual framework suggested by Victoria et al (1997). The framework suggests that the utilization of health services is affected by various factors at different levels. These levels are at community (distal), intermediate and proximate. (Khanal et al., 2014).

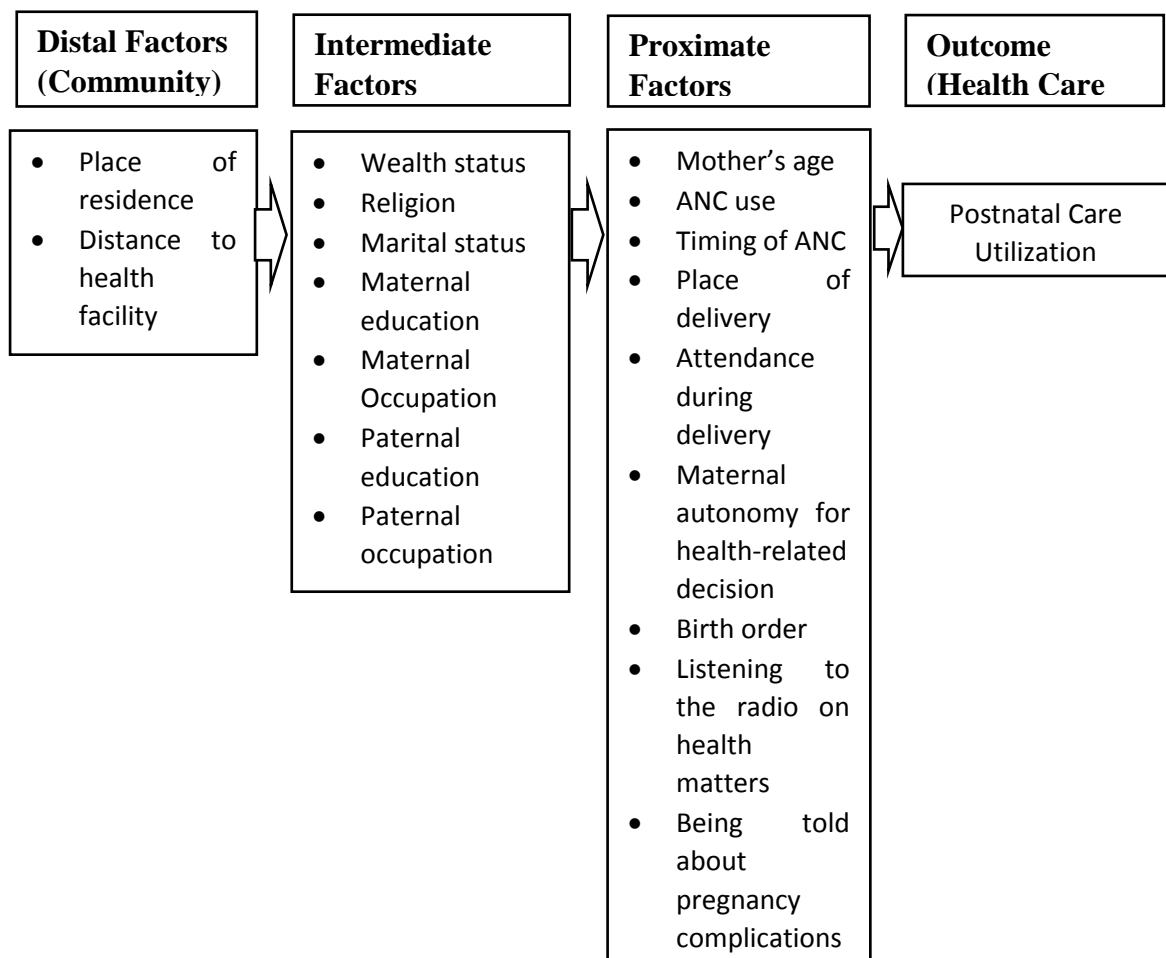


Figure 1: Conceptual framework of factors affecting postnatal care service utilization

1.7 Operational definitions

Distal (community) factors: factors that do not directly cause the outcome

Intermediate factors: factors that influence or are influenced by proximate and distal factors

Proximate factors: factors that act directly or almost directly to cause a health outcome

Postnatal period: The time from the birth of a baby to six weeks or 42 days after birth (WHO, 2014).

Postnatal care: The services provided to both the mother and her baby during postnatal period (WHO, 2014). (This study only focused on the maternal postnatal care)

Postnatal care utilization: The use of the postnatal care services by both mother and her baby (WHO, 2014).

Postnatal care coverage: The percentage or proportion of mothers and/or babies who utilized postnatal care services (CSO, 2014).

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

Various peer reviewed articles and other pieces of literature were obtained using several search engines particularly PubMed, Google Scholar and Hinari. The literature review highlighted postnatal care service coverage globally and in some individual countries and the factors associated with utilisation.

2.2 Coverage of postnatal care services

Despite the vital role of PNC in the continuum of care and particularly in the prevention of maternal morbidity and mortality, coverage is in resource limited countries as shown by several research work globally and regionally. In Pakistan, a study on simple ways to increase women postnatal uptake, showed that only 70 percent attended postnatal care clinic (Kabakian-Khasholian and Campbell, 2005). Work in Nepal on factors associated with the utilisation of postnatal care services among the mothers of Nepal using the Nepal Demographic and Health survey for 2011 revealed coverage of 26.5 percent in 2006 and a modest increase to 43.2 percent in 2011 (Khanal et al., 2014).

From the DHS data on 23 African countries, it was observed that the utilization of maternal health services decreases along the continuum of care from antenatal visit to postpartum services: 74 percent of women have attended at least one antenatal visit; 46 percent have benefited from assisted childbirth and 36 percent have had a postnatal visit within two days of giving birth (MEASURE Demographic Health Survey, 2014). In the Democratic Republic of Congo, for example, the study on an urban city, Lubumbashi, coverage was found to be low, where on one hand the antenatal coverage was as high as 93 percent, postnatal care coverage was a mere 34.6 per cent (Abel Ntambue et al., 2012). A study on antenatal and postnatal care utilization in Sideman, a populous and predominantly agriculture zone in southern Ethiopia showed

that antenatal coverage was around 77.4 percent while postnatal care utilization was only 37.6 percent (Regassa, 2011).

A study comparing PNC coverage in Bangladesh and Egypt using an analysis of results for the Demographic and Health Surveys for the two countries between 2004 and 2008 revealed 86 percent and 93 percent for Egypt and respectively and 46 percent and 67 percent for Bangladesh respectively. These coverage figures represent first 24 hours institutional based PNC utilization. Exclusion of the first 24 hours use of PNC reduced coverage in the two countries by 40 percent in Egypt and 78 percent in Bangladesh (Fort, 2012).

There are studies that have been done in Zambia in some specific districts of Zambia highlighting postnatal care coverage, for example, Jacobs (2007) in her unpublished study on the determination of factors associated with underutilization of postnatal care services among postpartum women in Mazabuka district of southern Zambia estimated that only 28 per cent were able to attend postnatal care clinics. Another recent study by Jacobs et al (2017) covering the four rural districts in northern Zambia estimated that only 52 percent of women in these areas utilize postnatal care services in the first 48 hours after the birth of the baby. In Zambia, the national representative coverage of postnatal care is obtained through the five-year interval Demographic and Health Survey. The 2013-14 ZDHS indicates a 63 percent coverage within the first 48 hours.

2.3 Determinants of postnatal care utilisation

Postnatal care has many factors that determine its utilisation. Studies in various settings have shown different combinations of these factors. In low and middle-income countries where the utilisation of postnatal care remains low, factors associated with utilization have been extensively studied.

A cross sectional study by Khanal et al (2014) in Nepal using the Nepal Demographic and Health Survey for 2011, showed how various factors affected postnatal care service utilization by mothers in that country. The factors were categorised as; (i) community, (ii) sociodemographic and (iii) proximate factors. The following factors were found to be associated with PNC service utilisation under community factors; place of residence either rural, urban or ecologically different areas i.e. mountainous regions. More women in urban and less mountainous ecological areas were more

likely to use postnatal care services than those who were in the rural and mountainous areas. Under sociodemographic factors, wealth status, religion, education and maternal occupation were associated with utilisation of postnatal care services. Women with a better wealth status, who were Muslim, educated and had maternal occupation other than being a farmer utilised postnatal care services more than their counterparts. Use of antenatal care services as recommended by WHO was associated with increased number of women utilising postnatal care services. Place of delivery i.e. at the health facility or home, affected usage of postnatal care services. More women who delivered at health facility also attended postnatal care clinic as compared to those who delivered at home. Being attended to by a skilled health worker was associated with increased chance of postnatal care service utilisation.

More evidence was further provided in a systematic and meta-analysis study in which thirty-six various studies across low and middle-income countries were considered. Intermediate determinants such as socioeconomic status, level of education and maternal occupation were associated with postnatal care service use. Place of residence especially in relation to the distance from and the availability of transport to the health facility determined the usage of postnatal care. According to this study, religion and ethnicity did not show any clear trends in the utilisation of postnatal care services (Langlois et al., 2015).

In Tanzania, Kante et al (2015) conducted a cross sectional study on factors associated with compliance with the recommended frequency of postnatal care services in three rural districts. The study showed that ANC attendance, socio-demographic factors such as age, religion and education attainment as well as parity significantly contributed to the utilization of postnatal care services. The finding that delivery at the health facility was not statistically significant was not consistent with studies such as the systematic analysis by Langlois et al (2015). Marital status, wealth quintiles, place of residence and timing of ANC were found not be statistically significant in postnatal care service utilization (Kanté et al., 2015).

Workineh and Hailu (2014) conducted a cross sectional study in Jabitena district, Amhara region in Ethiopia. The factors associated with postnatal utilization obtained from this study included, educational status of the mother, final decision maker on health care service utilization, number of pregnancy, place of delivery and being

aware of at least one postpartum obstetric danger sign. Level of education showed strong statistical association with postnatal care service utilization. Mothers who attended secondary school were about four times more likely to utilize postnatal care service than illiterate women. Similarly, having four and more children decreased the odd of utilizing postnatal care service by about four-fold compared to having one child.

Place of delivery was also an important predictor of postnatal care service utilization. Mothers who gave birth to their last child in health institutions were about four times more likely to utilize postnatal care services. Postnatal care service utilization also increased with increasing decision-making power of mothers. Mothers who were autonomous to make health care decision by themselves were about 13 time more likely to utilize postnatal care service than those whose health care decision was made by others.

Studies in Zambia on factors associated with postnatal utilization include one by Mwelwa (1997) and the other by Nsemukile et al (MoH, 1998) as cited by Jacobs (2012) in her unpublished study. Inadequate health education in postnatal care by health staff to ANC mothers and mothers being dissatisfied with staff attitude were found to be associated with underutilization of PNC (Mwelwa, 1997). On the other hand, Nsemukile et al (MoH, 1998) in a study from 17 districts found out that lack of knowledge on the importance of PNC (except for women in Lusaka, Kabwe, Kafue and Ndola) and the PNC schedule from men and women were associated with underutilization of postnatal care.

2.4 The Gap in literature

This literature review has revealed that postnatal care coverage is low in countries although at different levels. The factors associated with postnatal utilization seem to vary across different studies. Thus, conducting country or area specific studies is helpful in generating information for localized policy formulation. While various studies have been done in other countries, including systematic analysis on postnatal care and factors that influence utilization, there seems to be no detailed literature on Zambia's postnatal care service utilization. Studies in Zambia that have been reviewed were done at least nine or more years ago and were not using a nationally representative survey such as the Zambia Demographic and Health Survey. To

provide updated and nationally representative information in Zambia, this study of maternal postnatal care service and factors associated with utilization using the recently conducted 2013-14 ZDHS has been designed. The factors that will be obtained will be useful to program managers and policy makers for the designing of programs and formulation of policies to improve maternal postnatal care utilization coverage in Zambia.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

This was a cross sectional study, using secondary data from the 2013-2014 Zambia Demographic and Health Survey (ZDHS). The 2013-14 ZDHS by design is cross sectional. The ZDHS is a nationally representative sample survey of Zambian households. The main objective of the ZDHS is to provide information on levels and trends in fertility, childhood mortality, use of family planning methods, and maternal and child health indicators. This information is necessary for programme managers, policy makers, and implementers to monitor and evaluate the impact of existing programmes and to design new initiatives for health policies in Zambia.

3.2 Study site

The study covered Zambia, its rural and urban areas. Zambia covers a land area of 752,612 square kilometres. At the time of the 2013/14 ZDHS they were about 13.1 million people in Zambia (CSO, 2012). Administratively, the country was divided into 10 provinces and 72 districts at the time of the survey. Of the 10 provinces, two are predominantly urban, namely Lusaka and Copperbelt. The remaining provinces—Central, Eastern, Muchinga, Northern, Luapula, North Western, Western, and Southern—are predominantly rural. The capital city is Lusaka, in the south-central part of the country within Lusaka province (CSO, 2014). Currently Zambia has 10 provinces and 105 districts (CSO, 2016).

3.3 Study population

The population that was focused on was that of females of the reproductive age, between 15 and 49 years.

3.3.1 Inclusion and Exclusion criteria

This study included all women who had a child within the two years preceding the survey. The utilization of postnatal care was considered for the last birth prior to the survey. All women age 15-49 that were either permanent residents of the households in the sample or visitors present in the household on the night before the survey were eligible to be interviewed. All women who had a child within two years preceding the survey but did not attend postnatal care were excluded.

3.4 Sample size and Sampling techniques

This study was based on the 2013/14 ZDHS data, thus details of the sampling procedure, characteristics of the population of interest for this study including the sample size was as described in the 2013-14 Zambia Demographic and Health Survey (2013-14 ZDHS). For this study, all the 5,074 women ages between 15 and 49 who met the criteria in the 2013-14 ZDHS, a nationally representative sample were considered in this study.

The sampling frame used in the 2013-14 ZDHS is adopted from the Census of Population and Housing (CPH) of the Republic of Zambia provided by the Central Statistical Office (CSO). A representative sample of households in survey was drawn, 18,050 houses for the 2013-14 ZDHS. The sample were stratified and selected in two stages from the CPH frame. Therefore, the ten provinces were stratified into twenty sampling strata. Stratification was achieved by separating every province into urban and rural areas.

Samples were selected independently in every stratum by a two-stage selection. Implicit stratification and proportional allocation was achieved at each of the lower geographical/administrative allocation levels by sorting the sampling frame according to the geographical/administrative order and by using a probability proportional to size selection at the first stage sampling (CSO, 2014).

In the first stage, 722 standard enumeration areas (SEAs) for the 2013-14 ZDHS were selected with probability proportion to the SEA size. Selected SEAs with more than

300 households were segmented with only one segment selected for the survey with probability proportional to segment size. Household listing was conducted only in selected segments.

Therefore, a 2013-14 ZDHS cluster was either an SEA or a segment of an SEA. The household listing operation was conducted in all selected standard enumeration areas (SEAs), with the resulting lists of households serving as the sampling frame for the selection of households on the second stage. In the second stage selection, an average number of 25 households were selected in every cluster, by equal probability systematic sampling.

This study focused on postnatal care data collected in the 2013-14 ZDHS. The study included all women who answered the question on whether they had a child in the two years preceding the survey. The utilization of postnatal care was considered for the last birth prior to the survey. Women age 15-49 years and were permanent residents of the households or they spent a night before the survey were considered in the analysis of PNC coverage and associated utilization factors. The variables were derived from the women's questionnaire in the 2013-14 ZDHS. Questions that were considered in answering the objectives of the study were those focusing on the factors that are associated with PNC. These included background characteristics, birth history, knowledge and use of antenatal care services, place and skilled attendance during delivery, length of stay at the place of delivery among others. These factors were evaluated to understand postnatal care services utilization in Zambia.

3.5 Data collection and tools

Three questionnaires were used for the 2013-14 ZDHS. These were the Household, the Women's and Men's questionnaires. These questionnaires were based on the questionnaires developed for the measureDHS programme and were adapted to reflect the population and health issues relevant to Zambia. The Women's questionnaire was used to collect information from women age 15-49. In this study, data was extracted from the dataset keeping variables of interest on postnatal care service coverage and factors that are associated with utilization.

3.6 Variables

The 2013-14 ZDHS only provides proportions of women with respect to only six variables i.e. mother's age at birth, birth order, place of delivery, residence (urban or rural), maternal education and wealth status and did not use inferential statistics.

This study assessed additional variables (maternal and paternal occupation, religion, woman's final-say on health matters, birth attendance during delivery, ANC use and timing, marital status, distance to a health facility, being told about pregnancy complications and listening to the radio) that are in women's questionnaire but have not been analysed even though they are found to be significant in studies done for example, in Nepal by Khanal et al (2014) and Tanzania by Kante et al (2014). The variables whose proportions are shown in the ZDHS were analysed together with those not analysed at all in terms of PNC use in first 48 hours. Variables that were analysed in this study are shown in the table below.

3.6 Data Management and Analysis

Stata Version 13.0 Stata Corporation College Station, Texas (StataCorp, 2013) was used for both cleaning and analysis. The data was imported in the software, and then cleaned by ensuring that all incomplete and inconsistent entries are accounted for and excluded in the analysis, using the complete case analysis. For all categorical variables of interest, proportions were used as descriptive statistics to summarize the data from the 2013-14 ZDHS. The age of the mother at birth of her baby is a continuous variable, however, it was categorized and summarized using proportions as well (CSO, 2014). The association between postnatal care utilization within 48 hours and after 48 hours, and the independent variables were tested by using the Chi-squared test (χ^2) after checking the assumptions. To establish the strength of associations between significant variables in the Chi-square test, crude (unadjusted) odds ratios were used.

Significant variables in unadjusted logistics regression were then included in the multiple logistic regression models to generate adjusted odds ratios (aOR). For the multiple logistic regression analysis, a hierarchical modelling strategy was used. A p-value < 0.05 was considered statistically significant. To adjust for sample weight and multi stage sampling a Complex Survey Design using Stata procedure was used. The conceptual framework for analysis was adapted from Victoria et al which Khanal et al (2014) used in a similar study.

In the multivariable analysis, the distal (community) variables were entered first, followed by addition of the sociodemographic variables and finally the proximate variables. Significant variables in the preceding model were retained in proceeding

model, thus in model 1, community factors were entered. In model 2, sociodemographic factors were added retaining significant variables from model 1. In model 3, the significant variables from model 2 were retained and then proximate variables were added. Significant variables from model 3 were then ran in the final model.

The dataset that was compiled was kept on a laptop and external hard drive with secure passwords. The dataset would be kept for three years and discarded their after.

3.7 Ethical considerations

The protocol for this research was submitted to the ERES CONVERGE IRB for ethical review and approval (IRB No. 00005948, Ref. No. 2016-June-014). During the data collection for the 2013-14 ZDHS, consent was obtained from each of the participants in the survey and confidentiality was assured by de-identifying all respondents (CSO, 2014).

The dataset was obtained from CSO and Measure DHS through online registration. The permission to use datasets for 2013-14 ZDHS was obtained from CSO and measureDHS. To preserve confidentiality and privacy, the data was secured with passwords. The recommendations that have been made from this study would lead to improvement in postnatal care service coverage.

CHAPTER FOUR

RESULTS

4.1 Characteristics of respondents

A total of 5,074 women were considered in this study. Sixty-nine percent of mothers were in the age group 20-34 years. Approximately 98 percent of mothers had at least one ANC visit during their last pregnancy, of which 70 percent had their first ANC visit in the second trimester. Seventy-two percent of the respondents had their delivery of the last baby in the health facility and 69 percent of them were attended to by some skilled personnel.

Women who could decide on their own on health matters represented 31 percent of the respondents. Only 22 percent were first time mothers. Twenty-one percent of the respondents listened to the radio on health matters within six months prior to the

survey. Eighty-eight percent reported being told of pregnancy complications. Nearly 48 percent of the respondents were either in the poorer or poorest bracket for the wealth status characteristic. Women who were Protestants represented 83 percent of the total respondents and 80 percent were married. Fifty-four per cent of the women had primary school level of education on other hand 44 percent of women were unemployed. Forty-one percent of women with partners or husbands had their partners or husband with primary education and only two percent responding that their partner or husband were unemployed. Rural residence represented 66 percent of the respondents. Sixty-three percent of women indicted that distance to the health facility was not an issue.

4.2 Postnatal care utilization

Approximately two-thirds (63.4%; 95% CI 62.1-64.8) of the mothers utilized postnatal care within the first 48 hours after the delivery of the baby. Table 1 presents the characteristics of the respondents.

Table 1: Description of background characteristics of respondents

Characteristic	Weighted % (n*)	95% CI
Proximate Factors		
Mother's Age (in years, grouped)		
15-19	13.3 (675)	(12.4-14.3)
20-34	69.0 (3,501)	(67.7-70.3)
35-49	17.7 (898)	(16.7-18.8)
Use of ANC visits		
Yes	97.9 (4,966)	(97.5-98.3)
No	2.1 (105)	(2.0-3.0)
Timing of ANC		
1 st trimester	24.0 (1,201)	(22.9-25.2)
2 nd trimester	69.8 (3,489)	(68.5-71.0)
3 rd trimester	5.9 (295)	(5.0-7.0)
Did not know	0.3 (14)	(0.0-1.0)
Place of delivery		
Health facility (Public or private)	72.4 (3,670)	(71.1-73.6)
Other (e.g. home)	27.6 (1,401)	(26.4-28.9)
Birth attendance during delivery		
Skilled	68.8 (3,493)	(67.5-70.1)
Not skilled	31.2 (1,581)	(30.0-32.5)

Maternal autonomy for health decision		
Herself	30.8 (1,270)	(29.5-32.3)
Herself and her husband/partner (jointly)	41.5 (1,707)	(40.0-43.0)
Her husband /partner alone	27.2 (1,118)	(25.8-28.5)
Someone	0.4 (16)	(0.0-1.0)
Other	0.1 (5)	(0.0-1.0)
Birth order		
First	22.0 (1,114)	(20.8-23.1)
Second	17.9 (908)	(16.9-19.0)
Third or higher	60.1 (3,052)	(58.8-61.5)
Listening to the radio on health matters		
Yes	20.9 (1,059)	(19.8-22.0)
No	79.1 (4,014)	(78.0-80.2)
Being told about pregnancy complications		
Yes	88.1 (4,401)	(87.2-88.9)
No	11.7 (585)	(10.9-12.6)
Don't know	0.2 (10)	(0.0-1.0)
Wealth Status		
Poorest	24.6 (1,247)	(23.4-25.8)
Poorer	23.0 (1,169)	(21.9-24.2)
Middle	20.3 (1,028)	(19.2-21.4)
Richer	17.7 (899)	(16.7-18.8)
Richest	14.4 (730)	(13.5-15.4)
Religion		
Catholic	16.0 (808)	(15.0-17.0)
Protestant	82.8 (4,188)	(81.7-83.8)
Muslim	0.3 (20)	(0.0-1.0)
Other	0.7 (42)	0.1-1.1
Marital Status		
Married	80.4 (4,080)	(79.3-81.5)
Not married	19.6 (994)	(18.5-20.7)
Maternal Education		
No education	10.5 (533)	(10.0-11.0)
Primary	54.1 (2,740)	(52.7-55.4)
Secondary	31.7 (1,604)	(30.4-32.9)
Higher	3.8 (190)	(3.3-4.3)
Maternal Occupation		
Not working	44.5 (2,251)	(43.1-45.8)
Professional/technical/managerial	2.6 (133)	(2.2-3.1)
Agricultural-self employed	9.8 (498)	(9.1-10.7)
Agricultural-employee	24.1 (1,174)	(22.0-24.4)
Other	19.9 (1,005)	(18.8-21.0)
Paternal Education		
No education	6.8 (306)	(6.1-7.5)
Primary	40.6 (1,837)	(39.2-42.0)
Secondary	43.4 (1,966)	(42.0-44.9)
Higher	6.7 (302)	(6.0-7.4)
Don't know	2.5 (112)	(2.1-3.0)

Table 1: Description of background characteristics of respondents (continued)

Paternal Occupation		
Not working	1.8 (83)	(1.5-2.3)
Professional/technical/managerial	5.0 (225)	(4.4-5.7)
Agriculture-self employed	20.0 (901)	(19.9-22.2)
Agriculture-employee	34.5 (1553)	(33.1-35.9)
Other	38.6 (1734)	(37.2-40.0)
Distal (Community) Factors		
Place of residence		
Rural	66.3 (3,363)	(65.0-67.6)
Urban	33.7 (1,711)	(32.4-35.0)
Distance to health facility		
An issue - Yes	44.7 (2,264)	(43.3-46.0)
An issue - No	55.3 (2,807)	(54.0-56.7)
Postnatal care utilization in first 48 hours		
No	36.6 (1,854)	(35.2-37.9)
Yes	63.4 (3,220)	(62.1-64.8)

*From the total (5,074) weighted sample and the number of missing values may vary for each variable. CI, confidence interval.

4.3 Association between background characteristics and maternal postnatal care utilization

There was an association between all the background characteristics considered in this study and maternal postnatal care utilization except marital status ($p = 767$). Among the women in the age group 20-34 years, 65 percent attended PNC in the first 48 hours compared to 35 percent who did not, and this difference was significant ($p < 0.001$). For women who had their first ANC visit in the first trimester, 69 percent of them utilized PNC in the first 48 hours following delivery of the baby compared with 31 percent who did not, the difference was statistically significant ($p < 0.001$). Eighty-one percent of those who delivered in health facilities utilized postnatal care in the first 48 hours of delivery of the baby, this proportion was significantly different ($p < 0.001$) from the nineteen percent for those who utilized PNC after 48 hours following delivery of the baby. On the other hand 82 percent of mothers who did not delivered in health facilities used PNC after 48 hours compared to 18 percent who did even though they did not deliver in the health facility and this was significant ($p < 0.001$). Mothers who were attended to by skilled personnel during delivery and had utilized PNC in the first 48 hours after delivery represented a proportion of 82 percent ($p < 0.001$). The utilization of maternal postnatal care in the first 48 hours after the delivery of the baby and association with independent variables are shown in table 2.

Table 2: Association between background characteristics and maternal postnatal care utilization

Characteristic	PNC after first 48 hours % (n**)	PNC within first 48 hours % (n**)	P value*
Proximate Factors			
Mother's Age (in years, grouped)			
15-19	34.8 (235)	65.2 (440)	< 0.001
20-34	35.2 (1,233)	64.8 (2,268)	
35-49	43.0 (386)	57.0 (512)	
Use of ANC visits			
Yes	35.7 (1,773)	64.3 (3,182)	< 0.001
No	76.0 (80)	24.0 (25)	
Timing of ANC			
1 st trimester	31.1 (373)	68.9 (828)	< 0.001
2 nd trimester	36.5 (1,273)	63.5 (2,216)	
3 rd trimester	46.6 (137)	53.4 (156)	

Did not know	40.5 (6)	59.5 (8)	
Place of delivery			< 0.001
Health facility (Public or private)	19.0 (1,155)	81.0 (2,972)	
Other (e.g. home)	82.4 (699)	17.6 (246)	
Birth attendance during delivery			< 0.001
Skilled	18.1 (633)	81.9 (2,860)	
Not skilled	77.2 (1,222)	22.8 (360)	
Maternal autonomy for health decision			< 0.001
Herself	33.5 (426)	66.5 (844)	
Herself and her husband/partner (jointly)	34.5 (589)	65.5 (1,117)	
Her husband /partner alone	43.6 (488)	56.4 (630)	
Someone	50.0 (8)	50.0 (8)	
Other	80.0 (4)	20.0 (1)	
Birth order			< 0.001
First	28.1 (313)	71.9 (801)	
Second	32.0 (271)	68.0 (617)	
Third or higher	41.0 (1,250)	59.0 (1,802)	
Listening to the radio on health matters			< 0.001
Yes	28.5 (302)	71.5 (758)	
No	38.7 (1,553)	61.3 (2,461)	
Being told about pregnancy complications			< 0.001
Yes	33.8 (1,486)	66.2 (2,915)	
No	50.9 (298)	49.1 (287)	
Don't know	40.0 (4)	60.0 (6)	
intermediate factors			
Wealth Status			< 0.001
Poorest	52.8 (658)	47.2 (589)	
Poorer	44.3 (519)	55.7 (651)	
Middle	35.5 (366)	64.5 (663)	
Richer	21.5 (194)	78.5 (705)	
Richest	16.2 (118)	83.8 (612)	
Religion			= 0.011
Catholic	32.7 (264)	67.3 (544)	
Protestant	37.0 (1,551)	63.0 (2,637)	
Muslim	16.1 (3)	83.9 (17)	
Other	62.4 (26)	37.6 (16)	
Marital Status			= 0.767
Married	36.8 (1,500)	63.2 (2,580)	
Not married	35.6 (354)	64.4 (640)	

Table 2: Association between background characteristics and maternal postnatal care utilization (continued)

Maternal Education			< 0.001
No education	51.6 (275)	48.4 (258)	
Primary	40.8 (1,119)	59.2 (1,621)	
Secondary	27.0 (433)	73.0 (1,171)	
Higher	11.4 (22)	88.6 (169)	
Maternal Occupation			< 0.001
Not working	33.4 (753)	66.6 (1,498)	
Professional/technical/managerial	11.7 (16)	88.3 (117)	
Agricultural-self employed	51.9 (259)	48.1 (240)	
Agricultural-employee	45.5 (534)	54.5 (640)	
Other	28.3 (284)	71.7 (721)	
Paternal Education			< 0.001
No education	47.2 (145)	52.8 (162)	
Primary	44.9 (824)	55.1 (1,013)	
Secondary	31.7 (624)	68.3 (1,342)	
Higher	15.4 (47)	84.6 (256)	

Don't know	56.9 (63)	43.1 (49)	
Paternal Occupation			
< 0.001			
Not working	30.4 (25)	69.6 (57)	
Professional/technical/managerial	20.0 (46)	80.0 (180)	
Agriculture-self employed	50.6 (456)	49.4 (445)	
Agriculture-employee	46.0 (715)	54.0 (838)	
Other	25.9 (449)	74.1 (1,285)	
Distal (Community) Factors			
Place of residence			< 0.001
Rural	45.7 (1,538)	54.3 (1,825)	
Urban	18.5 (316)	81.5 (1,395)	
Distance to health facility			< 0.001
An issue - Yes	48.0 (1,087)	52.0 (1,177)	
An issue - No	27.3 (767)	72.7 (2,040)	

**From the total weighted sample and the number of missing values may vary for each variable. *P value from chi-square testing.

4.4 Predictors of maternal postnatal care utilization within the first 48 hours

Place of residence and distance to the health facility were significantly associated with postnatal care utilization (Model 1). Mothers in rural areas (aOR 0.27; 95% CI 0.22-0.33) were 73 percent less likely than those in urban settings to utilize PNC in the first 48 hours after delivery of the baby. Women who indicated that distance to health facility was not an issue (aOR 2.46; 95% CI 2.08-2.91) were twice more likely to utilize postnatal care in the first 48 hours than those who responded that distance to the health facility was an issue. When intermediate factors were added to Model 1 both place of residence ($p < 0.001$) and distance to the health facility ($p < 0.001$) factors from the community level remained statistically significant. Of the intermediate factors, only household wealth status ($p < 0.001$), marital status ($p = 0.039$) and maternal education ($p < 0.001$) were significantly associated with postnatal care utilization (Model 2). Mothers who were grouped into wealth status of poorer (aOR 1.29; 95% CI 1.06-1.58), middle (aOR 1.52; 95% CI 1.22-1.88), richer (aOR 1.77; 95% CI 1.28-2.45), and richest (aOR 1.60; 95% CI 1.02-2.51) were more likely to utilize postnatal care in the first 48 hours than those with poorest wealth status.

Mothers with primary education (aOR 1.55; 95% CI 1.24-1.93), secondary (aOR 2.88; 95% CI 2.24-3.71) and higher (aOR 8.26; 95% CI 4.84-14.07) were respectively more likely to utilize postnatal care than those without education. Women who were not married (aOR 0.74; 95% CI 0.58-0.96) were less likely to utilize postnatal care than those who were married. Religion (p value = 0.053), maternal occupation (p value = 0.230), paternal occupation (p value = 0.511) and paternal education (p value = 0.063) were not statistically significant.

When the proximate variables were added to the significant variables from Model 2, place of delivery ($p < 0.001$) and birth attendance during delivery ($p < 0.001$) were significantly associated with maternal postnatal care utilization. It is important to mention that being told about pregnancy complications ($p = 0.016$) was found to be associated with postnatal care.

Mothers who did not deliver at the health facility (aOR 0.13; 95% CI 0.09-0.20) were 87 per cent less likely to utilize postnatal care than mothers who delivered at a health facility. Women who were attended to by skilled personnel (aOR 2.35; 95% CI 1.58-3.51) were twice more likely to utilize postnatal care than those who were not. Only residence ($p < 0.001$) from community factors were significantly associated with postnatal care service utilization in the third model. Factors associated with the utilization of postnatal care based on unadjusted and adjusted logistic regression are presented in Table 3.

Table 3: Predictors of maternal postnatal care utilization within the first 48 hours in Zambia

Factor	Unadjusted OR (95%CI)	Adjusted OR (95%CI)		
		Model 1	Model 2	Model 3
Distal (community) factors				
Place of residence	P < 0.001	P < 0.001	P < 0.001	P = 0.044
Urban	1	1	1	1
Rural	0.27 (0.22-0.33)	0.34 (0.27-0.42)	0.53 (0.39-0.71)	0.61 (0.42-0.90)
Distance to health facility	P < 0.001	P < 0.001	P < 0.001	P = 0.472
An issue No	1	1	1	1
An issue Yes	2.46 (2.08-2.91)	1.63 (1.38-1.93)	1.52 (1.28-1.84)	1.12 (0.88-1.41)
Intermediate factors				
Wealth Status	P < 0.001		P < 0.001	P = 0.154
Poorest	1		1.00	1.00
Poorer	1.40 (1.17-1.68)		1.29 (1.06-1.58)	1.25 (0.99-1.59)
Middle	2.03 (1.66-2.47)		1.52 (1.22-1.88)	1.44 (1.09-1.90)
Richer	4.07 (3.10-5.34)		1.77 (1.28-2.45)	1.23 (0.83-1.84)
Richest	5.77 (4.28-7.79)		1.60 (1.02-2.51)	1.03 (0.62-1.78)
Religion	P = 0.009		P = 0.053	Not in the model
Catholic	1		1.00	

Protestant	0.82 (0.68-1.00)	0.77 (0.62-0.96)	
Muslim	2.53 (0.68-9.36)	1.39 (0.42-4.58)	
Other	0.29 (0.13-0.67)	0.30 (0.10-0.88)	
Marital Status	P = 0.589	P = 0.039	P = 0.465
Married	1	1	1
Not married	1.05 (0.88-1.26)	0.74 (0.58-0.96)	0.75 (0.35-1.62)
Maternal Education	P < 0.001	P < 0.001	P = 0.306
No education	1	1	1
Primary	1.55 (1.24-1.93)	1.31 (1.06-1.65)	1.18 (0.87-1.62)
Secondary	2.88 (2.24-3.71)	1.52 (1.16-2.00)	1.19 (0.83-1.72)
Higher	8.26 (4.84-14.07)	1.81 (0.63-5.19)	1.57 (0.75-3.29)
Maternal Occupation	P < 0.001	P = 0.230	Not in the model
Not working	1	1	
Professional/technical/managerial	3.78 (2.08-6.86)	1.26 (0.37-4.37)	
Agriculture- self employed	0.47 (0.34-0.63)	0.86 (0.63-1.19)	
Agriculture-employee	0.60 (0.50-0.72)	1.10 (0.89-1.34)	
Other	1.28 (1.04-1.56)	1.15 (0.93-1.42)	
Paternal Education	P = 0.011	P = 0.063	Not in the model
No education	1	1	
Primary	1.10 (0.82-1.47)	0.90 (0.67-1.21)	
Secondary	1.93 (1.43-2.59)	0.94 (0.70-1.27)	
Higher	4.92 (3.08-7.87)	1.27 (0.68-2.37)	
Don't know	0.71 (0.43-1.15)	0.55 (0.34-0.90)	
Paternal Occupation	P < 0.001	P = 0.511	Not in the model
Not working	1	1	
Professional/technical/managerial	1.73 (0.91-3.29)	0.88 (0.82-1.85)	
Agriculture-self employed	0.43 (0.24-0.76)	0.68 (0.34-1.20)	
Agriculture-employee	0.51 (0.30-0.89)	0.72 (0.42-1.24)	
Other	1.25 (0.72-2.19)	0.84 (0.48-1.44)	
Proximate Factors			
Maternal Age	P = 0.003		P = 0.751
15-19	1		1.00
20-34	0.98 (0.81-1.19)		1.35 (0.88-2.08)
35-49	0.71 (0.55-0.91)		1.28 (0.78-2.11)
Use of ANC	P < 0.001		P = 0.075
Yes	1		1.00
No	5.69 (3.08-10.53)		2.31 (0.91-5.85)
Timing of first ANC visit	P= 0.428		P = 0.516
1 st trimester	1		1.00
2 nd trimester	0.78 (0.65-0.94)		0.73 (0.58-0.92)
3 rd trimester	0.52 (0.38-0.70)		0.58 (0.57-0.90)
Did not know	0.66 (0.21-2.13)		0.68 (0.18-2.64)
Place of delivery	P < 0.001		P < 0.001
Health facility (Public or private)	1		1
Other (e.g. home)	0.05 (0.04-0.06)		0.13 (0.09-0.20)
Birth attendance during delivery	P < 0.001		P < 0.001
Not skilled	1		1.00
Skilled	15.33 (12.67-18.55)		2.35 (1.58-3.51)

Table 3: Predictors of maternal postnatal care utilization within the first 48 hours in Zambia (continued)

Maternal final say on health matters	P < 0.001	P = 0.248
Herself	1	1
Her husband /partner alone	0.96(0.78-1.17)	1.23 (0.95-1.58)
Herself and her husband/partner (jointly)	0.65(0.52-0.81)	0.88 (0.67-1.15)
Someone	0.52(0.17-1.60)	0.51(0.16-1,60)
Other	0.13(0.01-1.33)	0.25(0.03-2.29)
Birth Order	P < 0.001	P = 0.538
First	1	1
Second	0.83(0.66-1.04)	1.08(0.72-1.60)
Third or higher	0.56(0.47-0.68)	1.00(0.67-1.51)
Being told about pregnancy complications	P < 0.001	P = 0.016
No	1	1
Yes	2.03(1.62-2.55)	1.33(0.98-1.80)
Don't know	1.68(0.40-7.11)	6.09(0.77-48.25)
Listening to the radio on health matters	P < 0.001	P = 0.531
No	1	1

The significant variables from Model 3; place of residence, place of delivery, birth attendance and being told about pregnancy were fitted in the final model. The variable of being told about pregnancy complications during ANC visit was included in final model based on the overall p-value (0.016) obtained from Model 3. From the results, all the variables were significant adjusting one for each variable in turn. The results are presented in Table 4.

Table 4: Adjusted odds ratios of factors associated with maternal postnatal care utilization in the first 48 hours in Zambia: Final model

Characteristic	Adjusted OR (95% CI)	P value
Distal (Community) factors		
Place of residence		
Urban	1	
Rural	0.60 (0.47-0.77)	< 0.001
Proximate factors		
Place of delivery		
Health facility (Public or private)	1.00	
Other (e.g. home)	0.13 (0.09-0.20)	< 0.001
Birth attendance during delivery		
Unskilled	1	
Skilled	2.32 (1.58-3.38)	< 0.001
Being told about pregnancy complications		
No	1	
Yes	1.44 (1.08-1.93)	0.013
Don't know	2.71 (0.29-25.11)	0.377

CHAPTER FIVE

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

5.1 Discussion

This study aimed to investigate the factors associated with maternal postnatal care utilization in the first 48 hours after the delivery of the baby among mothers in Zambia. From the study about two thirds of mothers were able to utilize postnatal care services in the first 48 hours. The factors associated with the utilization of maternal postnatal care in the first 48 hours in this study were found to be; place of residence, place of delivery, skilled birth attendance during delivery and being told about

pregnancy complications. It was observed that none of the intermediate factors (wealth status, religion, marital status, maternal and paternal education and occupation) were significantly associated with postnatal care utilization in the multiple logistic regression model.

The finding that intermediate factors were not associated with maternal postnatal care utilization in the first 48 hours was contrary to the findings by Langlois et al (2015), who found strong and consistent evidence indicating for example, that the use of PNC was relatively high among women with high socioeconomic status and among more educated women. This study observed that there was reduced likelihood of postnatal care utilization by women living in rural areas compared to those in urban areas which could be attributed to many factors including distance from health facilities (Langlois et al., 2015), cultural practices or myths and beliefs. For instance, there are cultural practices which prevent recently delivered mothers and newborn to be touched by any one or leave the house until the 12th day after delivery (Karkee, 2012) and have been associated with non-utilization of postnatal care (Blandyopadhyay, 2009). Additionally, compared with women living in rural areas, women living in urban areas have generally better access to postnatal care services as well as other advantages of urban life, such as greater exposure to health-promotion programs (Langlois et al., 2015). From these findings the suggestion would be that unless deliberate measures were formulated and implemented to facilitate postnatal care utilization in rural areas, women in these areas would continue to have low utilization of this service which consequently would lead to maternal morbidity and mortality.

Place of delivery was found to be associated with PNC utilization in the first 48 hours. Women who did not deliver in a health facility were 87 percent less likely to use postnatal care in the first 48 hours after delivery of the baby. There are many factors that could explain an observation that a proportion of women did not deliver at health facilities and consequently reduced their chances of maternal PNC use in the first 48 hours. Studies by Mrisho et al. (2007) and Yuan et al (2014) found out that the low level of complete PNC compliance may arise from a combination of structural determinants, such as poor access to services, perceived lack of services at such facilities by mothers, perceived lack of importance of seeking PNC services, a shortage of community providers making routine home visits, costs and transportation difficulties, and other cultural, geographic or financial barriers. Thus strategies and

programs to specifically address these issues would contribute to the improved maternal PNC utilization. Maternal PNC should, for example, be provided by community health workers who are trained to provide such care during routine home visits as suggested by Yuan et al. (2014) for those who did not deliver at health facilities.

The positive association of PNC services utilization with place of delivery could also be attributed to the fact that women who gave their last birth in a health institution had greater opportunity to get exposed to health education related to PNC services at the time of delivery and thus get access to learn about the types, benefits and availabilities of PNC services during their stay in the health institutions (Workineh and Hailu). It would be important to conduct research to establish factors that lead to a proportion of women not utilizing postnatal care in the first 48 hours after delivery of the baby despite delivering in a health facility.

Being attended to by some skilled personnel during delivery as other studies have found (Jacobs et al., 2017 and Khanal et al., 2014) was significantly associated with maternal postnatal care utilization. Women who were seen by skilled personnel were twice more likely to utilize postnatal care in the first 48 hours than those not seen by any skilled personnel. This finding was in line with the Zambian postnatal guidelines which require that mothers should receive postnatal care from skilled attendants at least once within 48 hours after birth, before being discharged from the place of delivery (MCDMCH & MOH, 2013). Another important finding from this study, though not the focus of this study, was that nearly 20 per cent of women who were seen by some skilled personnel did not receive the postnatal care within the first 48 hours after delivery. Missing the opportunities to provide essential postnatal care in facility deliveries unnecessarily puts the lives of mothers and infants at risk. Future research needs to explore why such opportunities to provide postnatal care to mothers who deliver in health facilities and deliveries attended by skilled attendant are missed (Khanal et al., 2014).

From this study, it was observed that women who were told about pregnancy complications during their ANC visit were more likely to utilize postnatal care than their counterparts who were not told. Studies have found out that knowledge of postpartum obstetric danger signs was also found to be a strong predictor of PNC utilization. One study found out that mothers who were knowledgeable for at least one

postpartum obstetric danger sign were more likely to utilize PNC services as compared to those who did not spontaneously mention any postpartum obstetric danger sign (Workineh and Hailu, 2014). This result is similar with the study conducted in Uganda (Annet, 2004), where the observation that awareness of obstetric danger signs was an important factor in motivating women and their families to attend health care service at the earliest opportunity with the intention of prevention, early detection and getting management of their obstetric danger signs. This emphasized the need to have comprehensive and focused messages during ANC visit that would influence the maternal PNC utilization. Additionally, according to Kabakian-Khasholian and Campbell (2005) women who received information on maternal health had an increased likelihood of having a postpartum visit. Although, little is known about verbal information women receive from hospital sources, information provided through a booklet promoted the general value of a postpartum check-up, suggesting that the careful packaging of information about maternal health is key (Ransjo-Arvidson et al., 1998, Belizan et al., 1995). Bhutta et al. (2005) showed that behaviour change communication during antenatal care can promote demand for skilled intrapartum and postnatal care, indicating that awareness thus could be raised by a notification in advance.

5.2 Conclusion

This study found out that place of delivery, skilled birth attendance, place of residence and being told about pregnancy complications were factors associated with maternal postnatal care utilization within 48 hours after delivery of the baby in Zambia. To improve the current postnatal care coverage in Zambia, the factors associated with its utilization should be incorporated in programs and activities that deal with enhancing maternal health. Factors such as informing women about pregnancy complications during their antenatal visits could be considered as a low hanging fruit or a quick win in contributing to the improvement of coverage maternal postnatal care utilization.

5.3 Recommendations

From this study's findings, the following recommendations could be made;

1. More support is needed in the rural areas to increase maternal postnatal care utilization coverage. An understanding of factors that would influence the utilization of postnatal care service in rural areas is important in formulating programs and policies to improve and sustain coverage.

2. Health institution delivery continues to be a significant factor in predicting the maternal postnatal care service utilization in Zambia. Therefore, more programs, strategies and policies that support women, especially in rural areas to deliver in health facilities should be supported.
3. Providing adequate skilled personnel in health facility would contribute to maternal postnatal care utilization in the first 48 hours. It is important also to mention this study has revealed that one-fifth of women did not utilize postnatal care in the first 48 hours and therefore a study could be done to understand the factors why despite delivering at the health facility, this proportion of women still do not utilize postnatal care in the first 48 hours.

5.4 Limitations

Cross sectional studies limit the capacity to establish causal inferences. The information that was used was obtained retrospectively, raising the possibility of recall bias, however, this was addressed to some extent by only asking the women who gave birth within the last two years prior to the survey. The use of secondary data limited the assessment of associated factors to those that only are in the 2013-14 ZDHS.

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APPENDICES

Appendix A: Data Extraction Tool

STUDY TITLE:

FACTORS ASSOCIATED WITH POSTNATAL CARE SERVICE UTILIZATION AMONG MOTHERS IN ZAMBIA: A CROSS SECTIONAL STUDY BASED ON THE 2013-14 ZAMBIA DEMOGRAPHIC AND HEALTH SURVEY.

The following data was extracted from the women’s questionnaire to answer the research question on the factors associated with maternal postnatal care utilization in the first 48 hours in Zambia. The women’s questionnaire from the ZDHS is an internationally validated data collection tool on demographic and health information on women.

Variable and data extracted from 2013-14 ZDHS Dataset

SN.	Variables	Questions from ZDHS questionnaire	Response expected	Number of respondents
1.	Respondent’s Background			
	Age of the mother at birth	How old were you at your last birthday?	Age in years	
	Maternal Education	Have you ever attended school?	Yes or No	
		What is the highest level of school you attended?	Primary, secondary, or higher?	
	Religion	What is your religion?	Catholic....1 Protestant .2 Muslim.... 3 Other.....4	
	Place of residence	Categorized in the dataset	Rural or urban	
2.	Reproduction, Pregnancy and Postnatal			
	Birth order	Total number of live births	Specific number	
	Use of ANC	Once or more	Yes or No	
	Timing of first ANC	How many months pregnant were you when you had your first ANC visit?	Months	
	Being told about pregnancy complications	During (any of) your antenatal care visit(s), were you told about things to look out for that might suggest problems with the pregnancy?	Yes or No	
	Place of delivery	Where did you deliver the baby (last birth for those who had more than one birth in last five	Health facility (public or private) or home, another	

		years prior to the survey)?	place.	
	Birth attendance during delivery	Who assisted with the delivery of (NAME)?	Doctor, nurse, midwife, Clinical Officer, TBA or other.	
	PNC utilization	How many hours, days, and weeks after birth of (NAME) did the first check take place? (PNC, at a health facility and by health worker).	Either within 48 hours or after 48 hours.	
3.	Marriage and Sexuality			
	Marital status	Are you married or not?	Married. Single or other	
4.	Listening to the radio/TV on health matters	Do you listen to a radio/TV on health matters	Yes or No	
5.	Husband's Background, Woman's work and Wealth index			
	Husband's/Partners occupation	What is your husband/partners occupation?	Professional/technical or other	
	Husband's/Partner's education			
	Maternal occupation	Paid job or other job	Either one or the other	
	Maternal final-say on health matters	Who usually makes decisions about health care for yourself?	Self, husband/partner or jointly-self and husband/partner or someone else.	
	Wealth status	Wealth index as described by ZDHS dataset	Wealth index factor score.	
6.	Distance to the health facility	Many different factors can prevent women from getting medical advice or treatment for themselves. When you are sick and want to get medical advice or treatment, is each of the following a big problem or not?	Yes or No	

Appendix B: Variables

Type of variable	Variable	Indicator	Measurement Scale
Dependent	PNC Service Utilisation	Within 48 hours or after 48 hours.	Nominal
Independent (Community)	Place of residence	Rural or urban	Nominal
	Distance to health facility	An issue or not i.e. Yes or No	Nominal
Independent (Intermediate)	Wealth status	Wealth quintile (Lowest, Second, Middle, Fourth, Highest)	Ordinal
	Religion	Catholic, Protestant, Muslim or other	Nominal
	Marital status	Married, single or other	Nominal
	Maternal education	No education, primary, secondary or more than secondary	Ordinal
	Maternal occupation	Paid occupation, permanent, seasonal or other	Nominal
	Paternal education	No education, primary, secondary or more than secondary	Ordinal
	Paternal occupation	Professional/technical or other	Nominal
Independent (proximate)	Maternal age	Age in years	(Will be categorised) Ordinal
	Use of ANC	Yes or No	Nominal
	Timing of first ANC visit	Within first trimester or second and third trimester.	Nominal
	Place of delivery	Health facility (Public or private) or Other (e.g. Home)	Nominal
	Birth attendance during delivery	Skilled or Not skilled	Nominal
	Maternal final-say on health matters	Herself, her husband/partner, herself and her husband/partner (jointly) or someone else.	Nominal
	Birth order	First, second, third or higher	Ordinal
	Being told about pregnancy complications	Yes or no	Nominal
	Listening to the radio on health matters	Yes or no	Nominal