PREDICTORS OF HEALTH SEEKING BEHAVIOURS FOR CHILDHOOD FEBRILE ILLNESSES IN POOR RESOURCE SETTINGS, A CROSS SECTIONAL STUDY

DISSERTATION

By

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A dissertation submitted to the University of Zambia in partial fulfillment of the requirements of the degree of Master of Science in Medical Statistics

THE UNIVERSITY OF ZAMBIA

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Declaration

I declare that the work presented in this thesis entitled PREDICTORS OF HEALTH SEEKING BEHAVIOURS FOR FEBRILE ILLNESSES IN UNDER FIVE CHILDREN IN POOR RESOURCE SETTINGS OF ZAMBIA is to the best of my knowledge and belief my own work and that it is original. The dissertation has never been presented anywhere in whole or in part for the award of a degree in any university and all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Certificate of Approval

This dissertation of Apuleni Golden has been approved as partial fulfillment of the requirements for the award of the degree of Master of Medical Statistics by the University of Zambia.

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I, the undersigned have read this dissertation and approved it for examination

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Abstract

Predictors of health seeking behaviours for childhood febrile illnesses in poor resource settings, a cross sectional study. By Apuleni Golden.

Developing countries, including Zambia, account for larger share of child morbidities and mortalities due to childhood febrile illnesses. Studies on wider determinants of behaviour pertaining to treatment seeking for childhood febrile illnesses in poor resource settings are limited. This study investigated the health seeking behaviours of mothers in poor resource settings of Zambia and identified associated factors. Secondary data from a cross sectional study design from the Health for the Poorest Population (HPP) Project was analysed between March and May 2019. The survey was conducted in 2013 in Samfya and Chiengi in Luapula province and Luwingu and Mungwi in Northern Province of Zambia. A total of 1 653 mothers of children aged less than five years who had diarrhea, malaria, pneumonia or a combination of any of them two weeks prior to the interview were included in the study. Chi square test of independence was carried out to determine the differences between respondent's demographic characteristics and health seeking behaviour. Multivariable logistic regression was also done to identify predictors of health seeking behaviors for febrile illnesses in under five children in poor resource settings. Among the mothers interviewed, 64.6 % (1 068/1 653) were married while 35.4 % (585) were unmarried. Their age ranged from 15 years to 58 years. Mothers who sought care for their child for either of the illness accounted for 75.2 % (1 243/1 653) while 24.8 % (410/1 653) did not seek care for their child's illness. Factors typically associated with health seeking behaviours were mothers' marital status [aOR=0.74; 95%CI: 0.58-0.94], and mothers 'level of education [aOR=1.47; 95% CI: 1.13-1.92]. The study found that health seeking behaviours for childhood febrile illnesses in poor resource settings is relatively high and could be predicted by mother's level of education and marital status. Integrating interventions aimed at improving maternal & child health care with basic education to women and moral support counselling to families may potentially maximise health seeking behaviours in marginalized communities.

Keywords: *Childhood febrile illnesses, health seeking behaviours, maternal and child health care*.

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Acknowledgements

I would like to thank my supervisors Prof. Patrick Musonda and Dr. Choolwe Jacobs for their time and efforts in giving direction, sound advice and support that led to the completion of this research.

Special thanks goes to the Principal Investigator for the Health for the Poorest Population (HPP) Project for allowing me to use the data that was collected during the Project that I used in this study, without which this study would not have been successful.

My sincere gratitude also goes to the all the lecturers and my fellow students in School of Public Health, as well as my class mates for their encouragement and support in completing this dissertation.

May The Almighty God bless you all.

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Acronyms and Abbreviations

CSO	Central Statistics Office
HPP	Health for the Poorest Populations
MOH	Ministry of Health
NGOs	Non-Governmental Organisations
ORS	Oral Rehydration Solution
SA	Supervision Area
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UNZA	University of Zambia
UNZABREC	University of Zambia Biomedical Research Ethics Committee
WHO	World Health Organization
ZDHS	Zambia Demographic Health Survey

Definition of key concepts

Healthcare seeking behaviour – Healthcare seeking behaviour is defined as seeking Treatment for curing illness, avoiding complication or progression of disease by the mother/primary caregiver on recognition of signs or symptoms of illness from health facilities; hospitals, health centres, private clinics or health posts for an un-well child (WHO, 2010).

Febrile illnesses- in this study febrile illnesses are acute respiratory infections (ARI), diarrheal diseases and fever illnesses (Kololo et al, 2016).

Acute respiratory infection- is cough accompanied with difficulty of breathing for less than two weeks at any time within the two weeks before the survey (WHO, 2010).

Diarrhoea- if the mothers described their sick children had three or more loose or watery stools per day at any time within the two weeks before the survey (WHO, 2010).

Fever- is perceived as fever or hot body by caregivers for their sick children at any time within the two weeks before the survey (Diaz et al, 2013).

Appropriate care- Care that was sought first from health facilities: Desirable healthcare seeking is assumed when the healthcare was availed within 2 days after recognition of symptoms and use of modern medicine (Benson et al, 2016).

Chapter One: Introduction

1.0.0 Background

Childhood febrile illnesses remain responsible for a disproportionate number of infant and child deaths in resource-limited countries (Black et al. 2008). This is in spite of the global reduction of under-five deaths from 12.7 million in 1990 to 5.3 million in 2018 (UNICEF; UN, 2019; WHO, 2019). Despite these achievements and the fact that most child deaths are from preventable or treatable diseases, many countries still have unacceptably high levels of under-five mortality (WHO, 2019). Of the global under-five deaths, most deaths (98.7%) arise in developing countries (UNICEF, 2019), and approximately half (49.6%) occurred in sub-Saharan Africa alone in 2018 (UNICEF; UN, 2019). A large proportion of under-five deaths were from preventable and treatable diseases like acute respiratory infections, diarrheal diseases and malaria (UNICEF; UN; WHO, 2019; Bustreo, 2016). Most of these lives could have been saved through affordable treatment measures like antibiotics for acute respiratory infections, oral rehydration for diarrheal diseases and the use of appropriate drugs for malaria (Geldsetzer, 2014, Wardlaw, T., 2010). However, significant numbers of children continue to die without appropriate treatment and ever reaching health facilities or due to delays in seeking care in developing countries (Wiens, M., 2015, Geldsetzer, 2014).

Empirical evidence suggests that morbidity and mortality from febrile illnesses can be reduced considerably if appropriate health care is sought (Amarasiri de Silver, 2013). Mothers' ability to recognize and seek appropriate health care is essential in reducing child deaths in low-and middle-income countries where significant numbers of children continue to die from childhood febrile illnesses (Geldsetzer et al, 2014, Goldman, 2012). Unfortunately, poor and delays in care seeking for febrile illnesses has been reported in some low income countries (Adegboyega et al, Diaz et al, 2013).

In Zambia, health care seeking behavior is equally poor and only a small proportion of children receive appropriate treatment (Hamooya, B., et al, 2016). Nationally, only 27% of under-five children with symptoms of acute respiratory infection, 24.2% with fever and 32% with diarrhea were taken to health facilities during 5years preceding 2013 (Bennett et al, 2015). Seeking appropriate health care for common childhood illnesses were low and delayed as well (Deressa W., 2016, Assefa, T., 2016). Indeed, self-care and resorting to traditional healers during illnesses were commonly practiced in rural Zambia (Bennett et al, 2015, Hamooya, B., et al, 2016).

1.1.0 The health for the Poorest Populations Project

The health for the Poorest Populations Project was in response to the high Child and Maternal Mortality ratios in Zambia. A number of factors were identified to be contributing to this situation. Among them were: critical shortage of skilled human resource; inadequate funding; inadequate equipment; inadequate essential drugs and supplies; social and cultural barriers to key family practices; and ineffective mechanisms for targeting the poor populations.

In response to some of the challenges mentioned above, the Republic of Zambia and UNICEF with other cooperating partners developed a Health for the Poorest Populations (HHP) Project, an initiative aimed at accelerating the delivery of high impact interventions to poor and marginalized populations through community based approaches including integrated Community Case Management (iCCM). The initiative was intended to reduce disparities in intervention coverage and reduce morbidity and mortality by focusing on the worse off quintile districts and increase access to high impact lifesaving health interventions for children as close to the family as possible.

1.2.0 Statement of the Problem

Poor health care-seeking behavior for childhood febrile illnesses among caretakers of under five years children is still a major concern as it has a huge bearing on the morbidity and mortality in children aged less than five years. Due to that, these childhood febrile illnesses especially fever/malaria have remained a major concern of child survival in sub-Saharan Africa including Zambia despite the existence of effective curative and preventive measures. Although there is availability of health care facilities and qualified personnel in formal health facilities, febrile illnesses continue to cause 15–30 percent of deaths in under five years children in Zambia (MoH, 2017). Ensuring early diagnosis and appropriate treatment of diarrhea, malaria (fever), and acute respiratory infections is critical for reducing morbidity and mortality among young children. In Zambia, health care seeking behavior is poor and only a small proportion of children receive appropriate treatment (Hamooya, B., et al, 2016). Nationally, only 27% of under-five children with symptom of acute respiratory infection, 24.2% with fever and 32% with diarrhea were taken to health facilities during 5years preceding 2013 (Bennett et al, 2015).

According to the ZDHS report of 2015, of the estimated 43 percent of the fevers among under five years children in Zambia, which were due to malaria, only 28 percent of these children were taken for treatment at health facilities, and only 20 percent received an anti-malarial drug

within 24 hours of onset. Additionally, few children received appropriate treatment for symptoms of diarrhea and ARI. Coverage of oral rehydration salts (ORS), used in the treatment of diarrhea, was 35 percent, while less than 30 percent of children under the age of five years with symptoms of Acute Respiratory tract Infections received antibiotics. It can therefore be deduced that many children do not receive appropriate treatment for these childhood febrile illnesses.

A number of studies have been conducted to determine the predictors of health seeking behaviours by mothers for these childhood febrile illnesses, in which several factors have been identified. Among them are Structural factors such as distance to the health facilities (Gao, 2012), cultural beliefs, income (Geldsetzer et al, 2014), and mother's livelihoods (Diaz T, 2013); and socio-demographic factors such as mother's age (Ahmed, 2005), mother's level of education (Adeneye et al, 2013, Burton, 2011, Donnelly et al, 2011), mother's marital status (Kante, 2015, Abdul, 2013, Kololo T, 2016), child's age (Kante, 2015, Abdul, 2013), and sex of the child (Wardlaw et al, 2010, Najnin et al, 2011). Few studies however, have been done in poor resource settings to determine health seeking behaviours and associated factors. Evidence therefore, patterning to health seeking behaviours in poor resourced populations including Zambia is limited. This study therefore, focused on some marginalized populations in order to investigate mothers' health seeking behaviours for childhood febrile illnesses in under-five children and associated factors in Zambia.

1.3.0 Justification of the Study

Establishing predictors of health seeking behaviors for childhood illnesses among mothers of under five years children will help in coming up with specific interventions aimed at improving health seeking among care givers. This information when added into existing and new programs will therefore help in reducing infant and child mortality due to these febrile illnesses which account for nearly 40 percent of all child mortality and morbidity.

Moreover, few studies have looked at predictors of health seeking behaviour for childhood febrile illnesses in poor resource settings. Evidence therefore, patterning to health seeking behaviours in poor resourced populations including Zambia is limited. Therefore, there is still need to look at these marginalized populations in order to determine health seeking behaviours which will help in coming up with specific interventions aimed at addressing existing barriers to health care seeking among these populations.

1.4.0 Research Questions

1. What is the proportion of mothers who seek appropriate health care for childhood febrile illnesses in poor resource settings?

2. What are the individual factors that influence health seeking for mothers for childhood febrile illnesses in under five children in poor resource settings?

1.5.0 Research Objectives

1.5.1 General Objective

To determine the health seeking behaviours of mothers for febrile illnesses in under 5 years children in poor resource settings.

1.5.2 Specific Objectives

1. To determine the proportion of mothers of under 5 years children who seek appropriate health care for these febrile illnesses in poor resource settings.

2. To determine individual factors that influence health seeking for mothers for febrile illnesses in under five children in poor resource settings.

1.5.3 Conceptual Framework

There is a link among the different factors that influence health seeking behaviour of mothers for febrile illnesses in under 5 years children. This study adapted and modified the Anderson's behaviour Model framework which examines conditions that hinder utilization of a service at individual level (Wolinsky, 1988).

The purpose of this framework was to discover conditions that either facilitate or impede utilization. The goal being, to develop a behavioral model that provides measures of access to medical care. The model considers an individual's access to and use of health services to be a function of three characteristics:

1) Predisposing Factors: The socio-cultural characteristics of individuals that exist prior to their illness.

- Social Structure: Education, occupation, ethnicity, social networks, social interactions, and culture
- Health Beliefs: Attitudes, values, and knowledge that people have concerning and towards the health care system

- Demographic: Age and Gender

2) Enabling Factors: The logistical aspects of obtaining care.

- Personal/Family: The means and know how to access health services, income, health insurance, a regular source of care, travel, extent and quality of social relationships
- Community: Available health personnel and facilities, and waiting time
- Possible additions: Genetic factors and psychological characteristics

3) Need Factors: The most immediate cause of health service use, from functional and health problems that generate the need for health care services. "Perceived need will better help to understand care-seeking and adherence to a medical regimen, while evaluated need will be more closely related to the kind and amount of treatment that will be provided after a patient has presented to a medical care provider." (Andersen, 1995).

The study adapted this model to show the relationship among factors that influence health seeking behaviour for childhood febrile illnesses for under five years children. It focused on predisposing factors which include age of the mother, age of the child, sex of the child, mothers' educational level, and mothers' marital status among others to predict mothers' health seeking behaviours for febrile illnesses in under five children in poor resource settings.

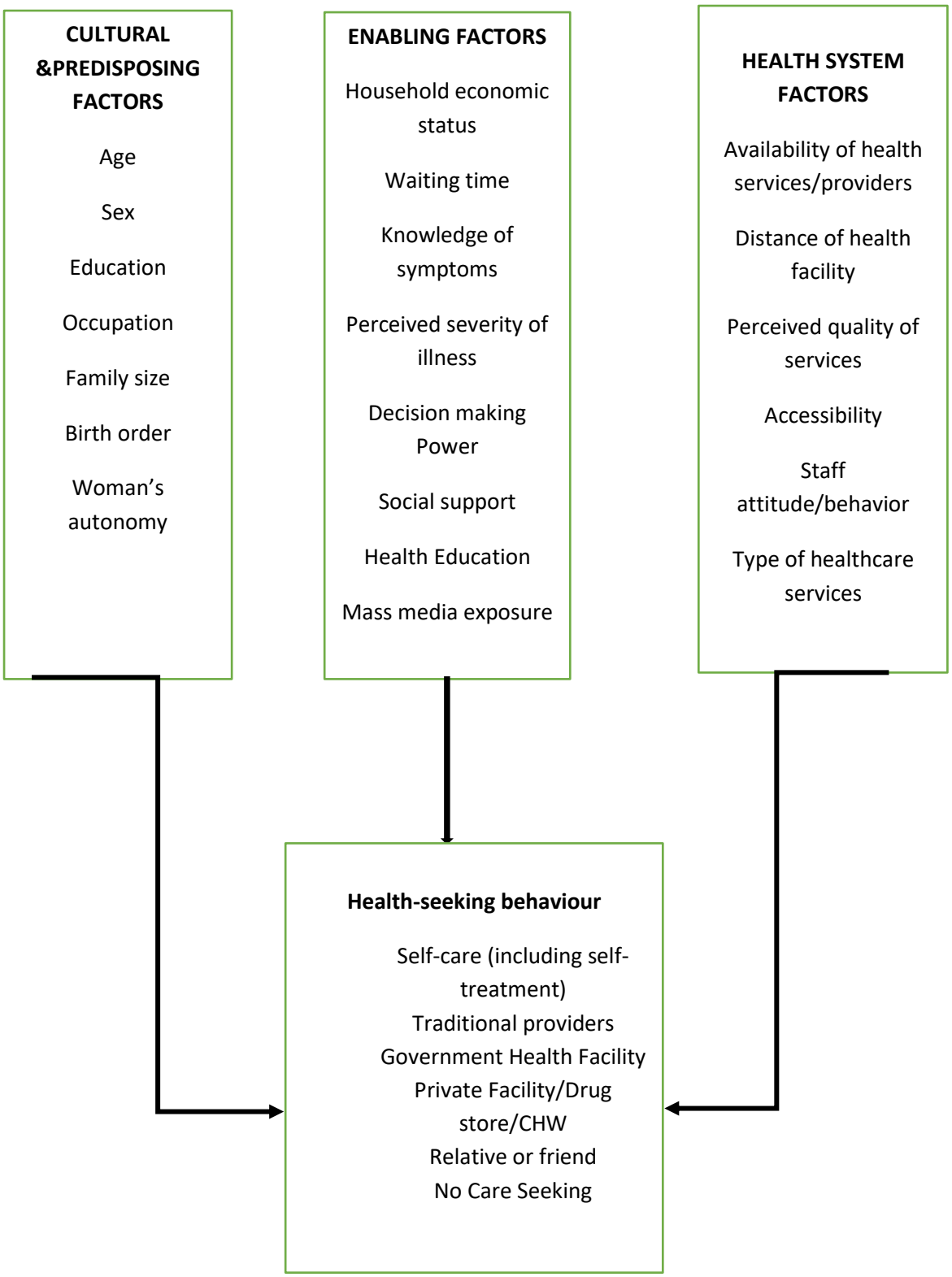

Figure 1.0 Conceptual framework for health seeking behaviour modified from Anderson's behaviour model. Anderson et al, 1995

Chapter Two: Literature review

2.0.0 Introduction

Several studies have been conducted to determine the predictors of health seeking behaviours among care givers for childhood febrile illnesses in children under five years of age. The studies have been conducted in both developed and developing countries including Zambia**.** A variety of factors have been identified as the leading causes of poor health seeking for childhood febrile illnesses among care givers. Using the Anderson's behaviour model framework, these factors can be grouped into three categories namely: Predisposing factors**,** enabling factors, and health systems factors. Each group of factors was considered separately in the following section.

2.1.0 Predisposing factors

Cultural and individual characteristic factors play an important role in the decision to seek treatment for common childhood illnesses. These factors have been examined in a variety of settings.

2.1.1 Socio-Cultural beliefs

Socio-cultural beliefs have been reported to be predictive of health care seeking behaviour. Some cultural beliefs and practices often lead to self-care, home remedies and consultation with traditional healers in rural communities in preference to formal health care seeking (Abdul, 2011, Geldsetzer et al, 2014). These factors result in delay in treatment seeking and are more common amongst women, not only for their own health, but for their children's illnesses as well (Gerald, 2015).

In most settings, socio-cultural practices and beliefs cut across age, socio-economic status of the family and level of education (Geissler, 2010). They therefore also have an effect on awareness and recognition of severity of illness, gender, availability and acceptability of health service.

2.1.2 Age, sex and birth order

Earlier studies have shown that mother's age was related to treatment seeking for childhood illnesses. Younger mothers were more likely than older mothers to take their child for treatment at health facilities for symptoms of illness (Ahmed, 2005, Kololo, 2013). Several factors may explain this pattern; for example, the child of younger mothers is more likely to be the woman's first child, and she would therefore be more likely to seek treatment than older mothers who may have several children. Also, older mothers may draw on their experience to discern

whether an illness is severe enough to warrant seeking medical attention (Goldman, 2010, Feyisetan, 2007). Other studies have documented that younger children were more likely to be taken for medical treatment than older children ((Kante, 2015; Abdul, 2013; Pandey et al, 2002). However, Hamooya (2016) found no difference in health seeking across all age groups in under five children in Zambia.

Some studies conducted in Northern and Eastern African Countries have also reported that boys were more likely to be taken for medical care than girls when sick (Pandey, 2002, and Najnin, 2011). Nonetheless, Hamooya (2016) found no discrepancy in health seeking between sexes in Zambia.

2.1.3 Education

Many studies have consistently shown that mothers with no education or only primary education were consistently less likely to take their child for treatment when sick, compared to mothers with secondary education or higher, for all three illnesses (Obrist, 2012; Goldman, 2002; Malhotra, 2013; Bhan, 2015). It is suggested that women with little or no education (1) are less likely to recognize severe symptoms in their sick child, (2) are more likely to seek treatment from a traditional healer, and (3) are less likely to have the financial and other resources to take the sick child for treatment at a health facility (Adeneye et al, 2013; Burton, 2011; Donnelly et al, 2011).

Nonetheless, Wardlaw (2010) in rural Kenya found that educated mothers were more likely to visit drug stores as they had financial resources than mothers with little or no education.

2.1.4 Marital status

Several studies have reported that mothers' marital status is predictive of health seeking behaviour for childhood febrile illnesses ((Kante, 2015; Abdul, 2013; Diaz, 2013; Kololo, 2016). A study in Ethiopia indicated that currently married mothers were more likely to seek appropriate health care for their sick children for febrile illnesses from health facilities than those who were not currently married (Kolola,T., 2016). In most settings, men play an important role in determining the health needs of the family. Abdul (2011) concluded that since men are decision makers and most often in control of resources, they decide when and where woman and their children should seek health care. As a result, women suffering from an illness report less frequently for health care seeking as compared to men despite them being the primary care givers (Ahmed, 2013).

2.2.0 Enabling Factors

Enabling factors play an important role in health care seeking among care givers. Several studies have shown an association between these factors and health seeking in many low income regions.

2.2.1 Economic Status

Several studies have documented that women living in poorer households are less likely to seek treatment for their sick child than women living in more affluent households (Hu, 2015; Taffa, 2005; Page, 2011). Care givers in the lowest (poorest) quintiles of the household wealth index were consistently less likely to seek treatment for their child with diarrhea, fever, and symptoms of ARI. (1) lack of money to pay user fees or medicine costs, (2) transportation costs to and from the health facility, and (3) time lost from work or farming to take the child for treatment were some factors that accounted for this ((Diaz, T., 2013; Bryce, 2014; Kassile, 2014; Okonofua, 2018).

Economic imbalance within society and lack of social security system make the poor more vulnerable in terms of affordability and choice of health providers (Wiens, 2015). Poverty not only excludes people from the benefits of health care system, but also restricts them from participating in decisions that affect their health, resulting in greater health inequalities (Page, 2011).

2.2.2 Recognition of signs and symptoms

Limited understanding of disease causation, signs & symptoms, and severity of illness has been documented as one of the associated factors to health care seeking behaviour (Grace, 2015). Mothers who were unable to recognize signs and symptoms of disease early have been reported to delay or not seeking medical care for their sick children (Odu, 2015). In communities that are not used to formal health sector, treatment delays often lead to low treatment seeking for childhood illnesses.

2.2.3 Perceived Severity of illness

Perceived severity of illness has been reported to increase formal health care seeking among care givers (Adegboyega, 2013). Early recognition of the severity of illness as danger signs such as fever and vomiting for instance, has been reported to increase the likelihood of seeking care (Dillip, 2013). Recognizing the danger signs and willingness to seek care nonetheless, tends to be associated with higher educational status and better household income (Taffa, 2015).

2.2.4 Exposure to health education

Exposure to health education is one of the predictors of health seeking behaviour or utilization of health care services. This exposure could be through Information, Education, and Communication (IEC), or mass media (Grace, 2015). Mothers who were exposed to some form of health education were more likely to seek health care for their children compared to those who were not exposed to health education (Geissler, 2013).

2.3.0 Health Systems Factors

Health systems factors are also among contributing factors of health seeking in most settings. Several studies have found an association between health systems and service utilization.

2.3.1 Distance to the health facility

Many studies have shown that distance from the nearest health facility acts as a significant barrier to seeking and accessing care for childhood illnesses (Gao, 2012; Bryce, 2014; Kassile, 2014; Kololo, 2016). In developing countries, the effect of distance on service use becomes stronger when combined with the dearth of transportation and with poor roads, which contributes towards increased costs of visits to health facilities (Burton, 2012). Other studies have documented that availability of transport, physical distance of the facility and time taken to reach the facility undoubtedly influence the health seeking behaviour and health services utilization (Okonofua, 2018). The distance separating patients and clients from the nearest health facility has therefore been remarked as an important barrier to seeking care for childhood illnesses, particularly in rural areas (Adeneye, 2013). Moreover, Wiens (2015) found that availability of health facilities within 15 minutes walking distance was a predictor for health-seeking behaviour. It can therefore, be concluded that time needed to reach health facilities influences health-seeking behaviour (Hu, 2015).

2.3.2 Quality of Care

Perceived quality of health care available to mothers/caregivers and actual quality of health care services available at the health facilities have been reported to be predictive of health care seeking behaviour (Gao, 2012). Both have been shown to be strong predictors of whether treatment is sought and where it is sought, across many low-income settings (Goldman, 2012; Alvesson, 2012; Hamooya, 2016). Client-perceived quality of services and confidence in the health provider affect the health service utilization (Gunjani, 2019). Atkinson (2009) found that whether medicine is provided by the health care facility or has to be bought from the bazaar has an effect on health seeking behaviour.

2.3.3 Availability of trained Staff

It has been reported in many studies that the dominant reason for the first choice of treatment at a particular health facility was the availability of trained personnel (Gerald, 2015; Goldman, 2012; Kololo, 2016). It can therefore be concluded that even if the health centre was far, the caregivers perceived quality of health care services they were getting outweighed any considerations of distance covered (Diaz, 2013).

From the literature reviewed, can be observed that several factors were identified as predictive of health seeking behaviours for childhood febrile illnesses. Among them are health systems factors such as distance to the health facilities (Gao, 2012), cultural beliefs, income (Geldsetzer et al, 2014), and mother's livelihoods (Diaz T, 2013); and socio-demographic factors such as mother's age (Ahmed, 2005), mother's level of education (Adeneye et al, 2013, Burton, 2011, Donnelly et al, 2011), mother's marital status (Kante, 2015, Abdul, 2013, Kololo T, 2016), child's age (Kante, 2015, Abdul, 2013), and sex of the child (Wardlaw et al, 2010, Najnin et al, 2011).

Few studies however, have been done in poor resource settings to determine health seeking behaviours and associated factors. Evidence therefore, patterning to health seeking behaviours in poor resourced populations including Zambia is limited. This study therefore, focused on some marginalized populations in order to investigate mothers' health seeking behaviours for childhood febrile illnesses in under-five children and associated factors in Zambia.

Chapter Three: Methodology

3.0.0 Study Design

The study was a cross sectional study design that used secondary data that was collected under the Health for the Poorest Populations (HPP) Project. Data was collected in 2013.

3.1.0 The health for the Poorest Populations Project

The health for the Poorest Populations Project was in response to the high Child and Maternal Mortality ratios in Zambia. A number of factors were identified to be contributing to this situation. Among them were: critical shortage of skilled human resource; inadequate funding; inadequate equipment; inadequate essential drugs and supplies; social and cultural barriers to key family practices; and ineffective mechanisms for targeting the poor populations.

In response to some of the challenges mentioned above, the Republic of Zambia and UNICEF with other cooperating partners developed a Health for the Poorest Populations (HHP) Project, an initiative aimed at accelerating the delivery of high impact interventions to poor and marginalized populations through community based approaches including integrated Community Case Management (iCCM). The initiative was intended to reduce disparities in intervention coverage and reduce morbidity and mortality by focusing on the worse off quintile districts and increase access to high impact lifesaving health interventions for children as close to the family as possible.

3.2.0 Study Setting

Four districts (Mungwi, Luwingu, Samfya, and Chiengi) were identified as where most vulnerable and marginalized people live in the country for the implementation of the project. These districts were selected after analysis of National data on the distribution of vulnerability, poverty, deprivation, and rights failures (UNICEF, 2011). The analysis identified 20 of the then 72 districts in the country whose vulnerability scores were above the mean. Mungwi and Luwingu districts in Northern Province and Chiengi and Samfya in Luapula Province were drawn based on the above criteria as Sites for implementing the Health for the Poorest Population Project. Northern and Luapula Provinces are among the Provinces with the highest maternal and child mortality rates (UNICEF, 2012). Consideration of potential NGO partners present and lowering transaction costs (cost of data collection and implementation of the project) were other factors which accounted for the selection of two districts from two provinces.

The total population of these four districts is 580, 090 (CSO, 2010), with Mungwi having a total population 144, 537, Luwingu 134, 426, Chiengi 109, 147, and Samfya having a population of 191, 980. (CSO, 2010).

3.3.0 Study Population

The survey targeted three categories namely: Children 0 to 59 months who had diarrhoea in last two weeks: Children 0 to 59 months who had fever in the last two weeks: Children 0 to 59 months who had cough in the last two weeks prior to the interview. However, data was collected through their mothers.

3.3.1 Inclusion and Exclusion criteria

The study included under five children who had either a cough, diarrhoea, or fever or a combination of any within two weeks of the interview and consented to be part of the study. However, data was collected through their mothers.

It excluded mothers of under five children who were not residents of the target districts and those who could not remember how long ago their child had had any of these Childhood illness.

3.3.2 Sampling Design and Sample Size

The Health for the Poorest Population Project used a Lot Quality Assurance Sampling (LQAS) method. The LQAS is a Sampling Method that can be used locally, at the level of a "supervision area," to identify priority areas (e.g., county, sub-county) or indicators that are not reaching average coverage or an established benchmark. Can provide an accurate measure of coverage or health system quality at a more aggregate level (e.g., program catchment area or district or refugee camp). Can be used for quality assurance using a 'minimal sample', 'maximal security' principle (Jacobs, C. et al, 2017).

The method originated in manufacturing sector to test the quality of the Lot of goods. However, several studies and health programmes have used the LQAS as a methodology to assess programme coverage and performance indicators in Public Health (Miller et al, 2014). The method works by dividing a programme area into smaller geographical 'Lots' or Supervision areas, e.g. Catchment area (CA) like a District into smaller areas, the Supervision Area (SA). A CA consists of a minimum of four SA, although, five or more is preferred and then samples units or participants from each Lot or Supervision area. The results are then compared with the decision rule or benchmark value. This helps in identifying areas that are meeting or failing the

benchmark values (Jacobs, C., et al, 2017).

Typically, LQAS uses a sample size of 19 individuals from each SA. A sample size of 19 provides an acceptable level of error for making management decisions; at least 92% of the time, it identifies whether a coverage benchmark has been reached or whether a SA is substantially below the average coverage of a program area. Samples larger than 19 have practically the same statistical precision as 19. They do not result in better information, and they cost more (Hosemer & Lemeshow, 1989).

In a case of 5 SA, This results in a sample of 95 respondents for the entire CA. By combining data from SAs, mangers can estimate coverage proportions of the entire catchment area with 95% confidence interval of + or – 10% for multiple indicators. In addition to this, LQAS has a unique approach in Parallel sampling. This applies when there are more than one questionnaires being administered and if a sampled unit is unable to complete all questionnaires or if an area is too small, the investigator moves to the next unit to finish the remaining questionnaires (Valadez et al, 2013). The Health for the Poorest Population Survey was done in 29 supervisory areas; nine (9) Supervisory Areas (SAs) each in Chiengi and Samfya, five SAs in Mungwi while in Luwingu, the survey was done in six SAs. Each SA had a sample size of 19 participants. Therefore, a total sample size of 551 participants was used per disease. Since the study was looking at three diseases, this brings the total sample size to 1 653. Detail of sampling for the study has been described elsewhere (Jacobs et al, 2018).

3.3.3 Data collection

Data was collected in 2013 using interviewer administered structured questionnaire from the mothers of under-five children. It was collected on socio-demographic characteristics of the mothers (age, residence, marital status, and educational status), history of childhood illnesses and mothers' 'healthcare seeking behaviours for common childhood illnesses among others. The main suggestive symptoms of common childhood illnesses; cough accompanied with difficulty of breathing for acute respiratory infections (ARI), three or more loose or watery stools per day for diarrheal diseases and fever for malaria were used to assess mothers' health care seeking behaviours.

3.4.0 Data quality control

Research Assistants fluent in local language (Bemba) and knew the culture of the communities were recruited to collect data. Training was given for the Research Assistants and supervisors on how to complete the questionnaire. The questionnaire was pre-tested in similar settings which were not part of the study area and the necessary modifications were made on some items of the questionnaire.

3.4.1 Data Management and Storage

The data was only handled by the researcher. It was stored on a password protected computer. The copies of the data were backed up on a flash drive in case the computer develops a problem. The data will be stored until publication of the results after which it will be deleted.

3.4.2 Data Processing and analysis

Data were cleaned and appended to create a new dataset containing diarrhoea, fever and pneumonia data, with a total of 1653 participants. Descriptive statistics was performed first to observe the characteristics of the variables. Associations between categorical variables were assessed using chi-squared test of independency as the assumptions of a chi-squared test were satisfied. To account for complex multistage sampling design and the clustered nature of the data, vce (cluster comp) syntax in Stata version 15 command was used. The vce robust syntax helps to take account of between and within cluster correlation. The main statistical analysis consisted of univariable and multivariable logistic regression to identify predictors of health seeking behaviours for childhood febrile illnesses in under five children in poor resource settings. An investigator led stepwise regression method was used in multiple logistic regression to select factors influencing health seeking behaviours for childhood febrile illnesses in under five children. The selection of variables that fit in the final multiple regression model was done by running the multiple logistic regression command with all the predictor variables and then removing those with highest p-values one by one from the model until only predictor variables that best predict the outcome remained in the model. Finally, the best fit model was selected based on the Akaike's Information Criterion and Bayesian Information Criterion (AIC and BIC) for the competing models. The model with smallest values for AIC and BIC compared to other models was chosen. Crude (cOR) and adjusted odds ratios (aOR) with their corresponding 95 percent confidence intervals (CI) were presented. A p-value of less than 0.05 was considered significant. Data analysis was performed using STATA version 15 (STATA corp. college station, Taxes USA).

3.4.3 Ethical Consideration

Dissertation approval to analyze the data sets was sought from the Principal Investigator Health for the Poorest Populations (HPP) Project, after which, ethical clearance and permission was sought from the University of Zambia, Biomedical Research Ethics Committee (UNZABREC. REF. NO. 222/2019). There was no direct contact with the participants and hence there was no pain or discomfort. Therefore, there was less than minimal risk involved. Furthermore, the data sets did not have participants' names, but had an identification number and hence anonymity and confidentiality was guaranteed. The benefit of the study was that knowing determinants of health seeking by mothers for childhood febrile illnesses would help put up specific interventions aimed at improving service delivery eventually improving the management of diarrhoea, malaria and pneumonia among under five years children in Zambia.

Chapter four: Results

4.0.0 Overall population description

A total of 1 653 mothers of under five children who had either diarrhoea, malaria, or pneumonia the past two weeks prior to the interview were included in the study. Among the Children, 882/1 653 (53.4 percent) were males while 771/1 653 (46.6 percent) were females. In terms of age, 398/1 653 (24 percent) were under ones while 1255/1 653 (75.9 percent) were aged between one year and less than five years. Of the 1 653 children, 551 (33.6 percent) had diarrhoea, 551 (33.6 percent) had fever, and 551 (33.6 percent) had pneumonia two weeks prior to the survey.

Among the mothers interviewed, 75.2 percent (1 243/1 653) sought care for their child for either of the illness while 410/1 653 (24.8 percent) did not seek care for their child's illness. The married accounted for 64.6 percent (1 068/1 653) of the mothers interviewed while 585/1 653 (35.4 percent) were unmarried. Their age ranged from 15 years to 58 years. Details of other demographic characteristic are given in table 1.0. Pearson's chi square analysis was carried out to determine the differences between the groups in health seeking behaviour.

Table 1.0: Socio-demographic characteristics of respondents (N=1 653)

Variables	Frequency (n)	Percentage (%)
Gender of child		
Male	882	53.4
Female	771	46.6
Age of child in months		
<12	398	24
12-59	1 255	76
Age of mother (years)		
<18	340	20.6
18-58	1313	79.4
Marital status		
Single	585	35.4
Married	1 068	64.6
Level of education		
Incomplete primary	876	53
Complete primary	777	47
Ability to read		
Yes	436	26.4
No	1 217	73.6

Chi square analysis was carried out to determine the associations between the categorical variables and health seeking behaviour. Table 2 shows the results between mother's socio-

demographic characteristics and health seeking behaviours as determined by Pearson's chi square test of independency.

Mothers with male children had higher appropriate health seeking behaviour 40.6 percent (671/1653) than mothers with female children 34.6 percent (572/1653). Nonetheless, There was no significant difference in health seeking between male children and female children (p-value = 0.741). The study further showed that children that were less than 12 months old 317/398 (79.60 percent) sought appropriate treatment compared to children aged more than 12 months but less than 60 months. There was no significant difference as well in health seeking between children aged under one year and those aged between one year and below five years (p-value = 0.158).

There was no evidence of the difference also in health seeking behaviour between those aged below 18 years and mothers aged 18 years and above (p-value = 0.304). Further, findings from this study revealed that those who were married sought appropriate treatment 786/1068 (74.0 percent) compared to those that were not married. There was a significant difference in health seeking between married mothers and unmarried mothers (p-value= 0.014).

Table 2.0: Cross tabulation of the predictors of health seeking

	Sought Care for Child's illness		
Factor	**No**	**Yes**	***P. Values***
Mother' age <18 year	78 (4.7%)	266 (16%)	
18-58 years	232 (20%)	977 (59.1%)	0.741 C,M
Marital Status			
Married	282 (17%)	786 (47.5%)	
Unmarried	128 (7.7%)	457 (27.6%)	0.014 C,M
Child's age			
0-11 months	81 (4.9%)	317 (19.2%)	
12-59 months	329 (19.1%)	926 (56%)	0.158 C,M
Sex of a Child: Male	211 (12.8%)	671 (40.6%)	
Female	199 (12%)	572 (34.6%)	0.698 C,M
Education level			
Incomplete primary	384 (30.4%)	492 (40.0%)	
Complete primary & above	88 (10.0%)	298 (23.6%)	0.004 C,M
Able to read:			
Yes	93 (5.6%)	343 (20.8%)	
No	317 (19.2%)	900 (54.4%)	0.359 C,M

Key: C= Chi-squared test of association, M=Showing that there were missing values but p-values were obtained on complete case analysis.

Mothers who completed at least primary school sought appropriate treatment 298/386 (77.2 percent) for their children compared to those that did not have primary education. There was a

significant difference in health seeking between mothers who at least completed primary school compared to mothers who did not even have primary education as evident by the p-value (p.-value= 0.004). Results however, showed no significant difference in health seeking between mothers who could read and those who could not read (p-value = 0.359).

4.1.0 Regression analysis

A logistic regression was performed to examine the predictors of health seeking for febrile illnesses among mothers of under five children. A p-value of less than 0.05 was considered significant at 95 percent confidence interval.

4.2.0 Predictors of healthcare-seeking behavior for childhood illnesses

A logistic regression was performed to examine the predictors of health seeking for febrile illnesses among mothers of under five children. A p-value of less than 0.05 was considered significant at 95 percent confidence interval.

Table 3.0: Logistic Regression-Adjusted and Unadjusted

Factor *Health Care Seeking*	***Unadjusted***			***Adjusted***		
	Odds Ratios	95% Conf.Interval	P-values	Odds Ratios	95% Conf. interval	P-Values
Mother' age 18-58 years <18 years	1.06	Ref. 0.76-1.46	0.741	0.75	0.40 -1.42	0.381
Child's age 12-59 mths <12 mths	1.22	Ref. 0.92-1.62	0.159	1.46	0.81-2.63	0.203
Child's sex Females Males	1.06	Ref. 0.83-1.31	0.698	1.13	0.70-1.80	0.618
Marital Married Unmarried	0.74	Ref. 0.58- 0.94	0.014	0.74	0.58 - 0.94	0.0015
Education level Incomplete primary Complete primary & above	1.47	Ref. 1.13-1.92	0.005	1.41	1.13-1.92	0.005
Able to read No Yes	1.13	Ref. 0.87- 1.48	0.359	0.90	0.57-1.43	0.662

The results of univariate analysis, that is, crude odds ratios (cOR) in Table 3.0 show that marital status of the mothers, that is, mothers who were unmarried had reduced odds of seeking appropriate health care for their sick child by 26 percent compared to mothers who were married (cOR=0.74;95%CI: 0.58-0.94), and mother's education level, that is, whether mother had at least completed primary school, mothers who had completed at least primary school had 1.5 times the odds of seeking appropriate health care for their child compared to mothers who

had not completed primary school (cOR=1.47; 95% CI: 1.13-1.92), were significantly associated with health care seeking behaviours. On the other hand, child's age (cOR=1.22: 95%CI: 0.92-1.62), mother's age (cOR=1.106: 95%CI: 0.76-1.46), mothers' ability to read (cOR=1.13: 95%CI: 0.87- 1.48) and sex of the child (cOR=1.06: 95%CI: 0. 0.83-1.31) had no statistically significant association with health care seeking behaviours.

Table 5 shows the final multivariable analysis model arrived at that fits the data well. Multiple regression was done in order to control for possible confounding. An Investigator led stepwise Regression was used to arrive at the model. This implies running the multiple logistic regression command with all the predictor variables in the first stage and then removing variables with highest p-values one by one from the model until we remained with a model that best explained the data (parsimonious model). The best fit model was selected based on the Akaike's information criterion and Bayesian information criterion (AIC and BIC) for the competing models. The model with the smallest value for AIC and BIC compared to other models was settled for (the results of the diagnostic models were not shown as they were for model diagnostic purpose only).

The model contains four explanatory variables; child's age, sex of the child, marital status of the mother, and mother's education level as the best predictors of health seeking for childhood febrile illnesses. Although child's age and sex were not statistically significant, the variables were left in the model due to priori knowledge from other studies which consistently showed that they could be used to perfectly predict health seeking behaviours for childhood febrile illnesses.

As shown in Table 5, marital status and maternal education were significantly associated with health seeking behaviour.

The effect of marital status, that is, whether mother was currently married or unmarried was that mothers who were unmarried had reduced odds of seeking appropriate health care for their sick child by 26 percent (OR = 0.74; 95% CI = 0.58–0.94) compared to mothers who were currently married, holding constant the effect of other predictors in the model. The other predictor was maternal education, mothers who had completed at least primary school were 1.5 times more likely to seek appropriate health care for their child (OR =1.5; 95% CI=1.15 -

1.96) compared to mothers who had not completed at least primary school holding constant the effects of other predictors in the model. On the other hand, child's age (OR=1.20: 95%CI: 0.91-1.60), and sex of the child (OR=1.06: 95% CI: 0. 0.84-1.33) had no statistically significant association with health care seeking behaviours controlling for the effect of other predictors in the model.

Table 4.0: Logistic Regression-Adjusted

Factor	***Adjusted***		
Health Care Seeking	Odds Ratios	95% Conf.Interval	P-values
Mother' age 18-58 years <18 years	1.06	Ref. 0.76-1.46	0.741
Child's age 12-59 mths <12 mths	1.22	Ref. 0.92-1.62	0.159
Child's sex Females Males	1.06	Ref. 0.83-1.31	0.698
Marital Married Unmarried	0.74	Ref. 0.58- 0.94	0.014
Education level Incomplete primary Complete primary & above	1.47	Ref. 1.13-1.92	0.005
Able to read No Yes	1.13	Ref. 0.87- 1.48	0.359

Table 5.0: Multivariable analysis

Care Seeking	***Odds Ratios***	***P-values***	***95% Confidence Intervals***
Child's age 12-59 months <12 months	Ref. 1.20	0.196	0.91 - 1.60
Marital Status Married Unmarried	Ref. 0.74	0.015	0.58 - 0.94
Sex of Child Female Male	Ref. 1.06	0.623	0.84 - 1.33
Education level Incomplete primary Complete primary & above	Ref. 1.50	0.003	1.15 - 1.96

Best fit model

Chapter five: Discussion

This study was carried out to assess factors associated with health seeking behaviours for childhood febrile illnesses among mothers of under-five years children in Luapula and Northern Provinces of Zambia. The study revealed vital findings regarding mothers' health - seeking behaviour for these childhood febrile illnesses (diarrhoea, malaria, and pneumonia). The finding of this study shows that three in every four mothers sought treatment from health facilities for their children below five years. This finding is consistent with other studies that determined health care seeking behaviours for childhood febrile illnesses in other rural settings (Adeneye, 2013; Kadobera, D., 2012; Megan, L. eta al, 2011).

Andersen-Newman Framework for Health Services Utilization (Andersen, 1995) indicates that utilization of health services is influenced by various factors such as population and environmental characteristics. Our findings also have shown that various individual factors such as mothers' education level and marital status were associated with health care seeking behaviours for childhood febrile illnesses in poor resource settings. These results are similar to findings of other studies done in rural Ethiopia and Nigeria that looked at socio-demographic determinants of mothers' health care seeking behaviours for febrile illnesses in under five children in rural areas (Kololo, T., 2016, Adeneye, 2013).

Finding that majority (75.2.0 percent) of the mothers sought treatment from health facilities for their children below five years for febrile illnesses seemingly could suggest mothers' preference and trust for seeking care for their under five years children from the formal health facilities. Mothers' trust in the formal health services coupled with the abolishment of user fees, could have great influence on the choice of treatment point (Kololo, T, 2016). The proportion of mothers who sought care from formal health facilities is similar to those found in other studies carried out in rural Democratic Republic of the Congo (51 percent), remote Madagascar (53 percent) and rural Nigeria (56 percent) where mothers use formal health services as their first point of care for their children below five years (Adeneye, 2013; Kadobera, D., 2012; Megan, L. eta al, 2011). The findings are also supported by two other studies done in rural parts of Uganda where mothers use formal health services as their first point of health care for their children (Katrina, 2014, Tumwesigire, S, 2002). However, the results are contrary to the findings of some study in rural Liberia where only 23 percent of the mothers sought for treatment from formal health facilities for childhood febrile illnesses. This

was due to the presence of facility fees which decreased satisfaction with formal health system (Kruk et al, 2011).

The study also showed that mothers' education level was predictive of health care seeking for their child's febrile illness. A strong association between mothers' level of education and health seeking behaviours found in this study suggests the importance of basic education to care seeking behaviours. Several studies have reported a positive relationship between maternal education and health seeking behaviour, which is in agreement with the present study (Adeneye et al, 2013, Abdul, 2013). This finding suggests need to improve literacy rates in Zambia as a proxy to improving care-seeking behavior. Some arguments were made by Gerald (2015), that educated women easily comprehend health education and awareness messages. Hence, fostering early recognition of signs and symptoms of illness (Burton, 2011). This result was consistent also with other studies conducted in rural Sierra-Leone and rural Cote D'Ivoire where mothers with at least post-primary education were more likely to seek treatment from health facilities for their children (Donnelly, 2011, Kruk et al, 2012). It is also documented in some study in Uganda that the odds of seeking appropriate health care increased if mothers had completed at least primary school education (Bhan, 2015). Hana in Yemen also reported that caretakers with secondary school education were six times more likely to seek medical care than noneducated ones. She therefore argued that educated mothers are more likely to be able to read comprehensibly and thereby understand better. They are expected to understand health education messages presented in mass media and through other methods more than the less-educated ones (Hana et al, 2013). In line with this thought, in another study that compared women's utilization of Primary Health Care (PHC) units for Antenatal Care (ANC), it was reported that women with higher education were more likely not to use PHCs for antenatal and delivery care in preference for secondary care facilities. Better educated women were more likely to ignore the services in PHCs on quality perceptions and presumably opt for services in private clinics or in secondary/tertiary care facilities (Raghupathy, 1996). Similarly, in other studies that looked at utilizations of Antenatal care services (ANC), maternal education were reported to be highly associated with utilizations of ANC services (Gunjani, et al, 2019). Some researchers, however, that looked at predictors of utilizations of maternal, neonatal and child health services, question the sole independent association of maternal education on maternal, neonatal and child health services utilization. They argue that other factors such as economic, socio-environment and husband's level of education and occupation interact to dilute the

association (Gage, A. et al, 2006, Raghupathy, 1996).

However, other studies reported otherwise. In rural Ethiopia and rural Senegal, Getahun (2010) and Smith et al (2010) respectively, found that mothers' level of education was not associated with initial place of treatment. In other studies conducted in Uganda, education was not a factor in 68 percent of the caregivers' that had sought treatment from health facilities (Hildenwall, H. eta al, 2009).

Another predictor of health seeking behaviours by mothers for children below five years for childhood febrile illnesses was marital status. In the study, married mothers had increased odds of seeking appropriate health care for their child's illness by 26 percent compared to unmarried ones. Motivation for the married caregivers to seek appropriate health care may result from support and push from the partner and extended family. The suggestion is consistent with social network and closely knit family linkages common in most African cultures where a family member is considered as part of the larger community playing critical role in health care decisions (Diaz, 2013, Kololo, 2016). This study conquers with KololaT (2016)'s findings in Ethiopia who indicated that currently married mothers were more likely to seek appropriate health care for their sick children for febrile illnesses from health facilities than those who were not currently married. Several studies in Ethiopia and Sierra Leone (Diaz, 2013, Kololo, 2016), documented that mother's relationship to the head of the household was predictor of health seeking behaviours. In a related study in India that looked at factors associated with ANC utilizations, child's father presence during any ANC visit was associated with higher utilizations of full ANC (Gunjani et al, 2019), this is of special interest in the context of a patriarchal society like Zambia. Child's father presence during ANC visit, may reflect greater spousal care and support, joint decision making and a more caring environment at home (Lewis et al, 2015, Bhatta, 2013). In another study in rural Nigeria that looked at barriers to utilizations of Primary Health Care (PHC) Units, it was reported that married women were more likely to use PHCs for antenatal care as compared to women living together with a partner who is not their husband (Okonofua et al, 2018). It can therefore be argued that formal marital union is associated with better health seeking behavior than consensual union or cohabitation not only for maternal and child health services, but for other health services as well. Abdul (2013) concluded that since men are the family head, principle caregivers, and decision makers and mostly provide the financial resources to actualize the plans, married women most often sought

care for theirs and their child's illness compared to their unmarried counterparts.

Unlike most studies that showed that sex of the child was significantly associated with health seeking behaviour (Najnin et al, 2011, Hu, 2012), the study found otherwise. These studies have documented that male children were more likely to be taken for appropriate health care compared to female children. A possible reason for this could be cultural beliefs in the study area where male children were having more priority than female children, although recently families are giving priority to female children as well. The findings revealed by studies in Bangladesh and Myanmar (Najnin et al, 2011, Hu, 2012). This study found no evidence of the difference in health seeking between male and female children. Likewise, there was no significant difference regarding the age of the child and health seeking which was inconsistent with what was reported from Senegal, Tanzania and Bangladesh that younger children were more likely to be taken for appropriate health care when sick compared to older children (Smith et al., 2010, 2016; Kassile et al. 2014; Najnin et al, 2011).

Chapter Six: Conclusion and recommendation

6.0.0 Conclusion

It was established in this study that health care seeking behaviours for febrile illnesses in poor resource settings could be predicted by mother's level of education and marital status. The majority of the mothers (75.2 percent) sought appropriate health care for childhood febrile illnesses. This offers an opportunity for health care workers to provide appropriate health care service in line with Government policy and would eventually lead to reduction in child mortality and morbidity (Hanson, K. et al, 2005).

6.1.0 Recommendations

Study findings show that mothers' education level and marital status were strongly associated with health care seeking for these childhood febrile illnesses. In line with government policy on health service delivery aimed at taking health care service close to the family as possible, there is need to integrate these efforts with the provision of basic education to women and girls. Education will result in increased awareness and knowledge (Adeneye et al, 2013), thereby fostering early recognition of signs and symptoms of illness which will create demand for health services thereby, acceralating health care seeking behaviours (Feyisetan, B., 2012).

Further, intensified health education campaigns by Luwingu, Mungwi, Samfya and Chiengi District Health Offices and frontline Health workers about the importance of early health care seeking for childhood febrile illnesses. Involving Community Health Workers (CHWs) in disseminating information on childhood febrile illnesses coupled with mass media (radio and television) programmes in local languages. Such a strategy has been shown to be critical in other studies not only for childhood febrile illnesses but for other health programmes (Lacroix et al., 2014). In addition, provide moral support counselling to families in order to enhance family cohesion which may potentially maximise health seeking behaviours in marginalized communities (Whitney et al, 2014).

6.2.0 Study Limitations and strengths

The study was not free from limitations. Firstly, the study used secondary data. As a result, there was no room to introduce new variables. In addition, the data analyzed was collected in remote settings, hence it may not be generalizable to other settings.

The strengths of this study included using Lot Quality Assurance sampling method that enabled generalization of results in similar settings since the study population was highly

representative. The study also provides useful information on predictors of health seeking behaviours by mothers for febrile illnesses in resource poor settings which may inform health policy on bridging the gap to health service accessibility.

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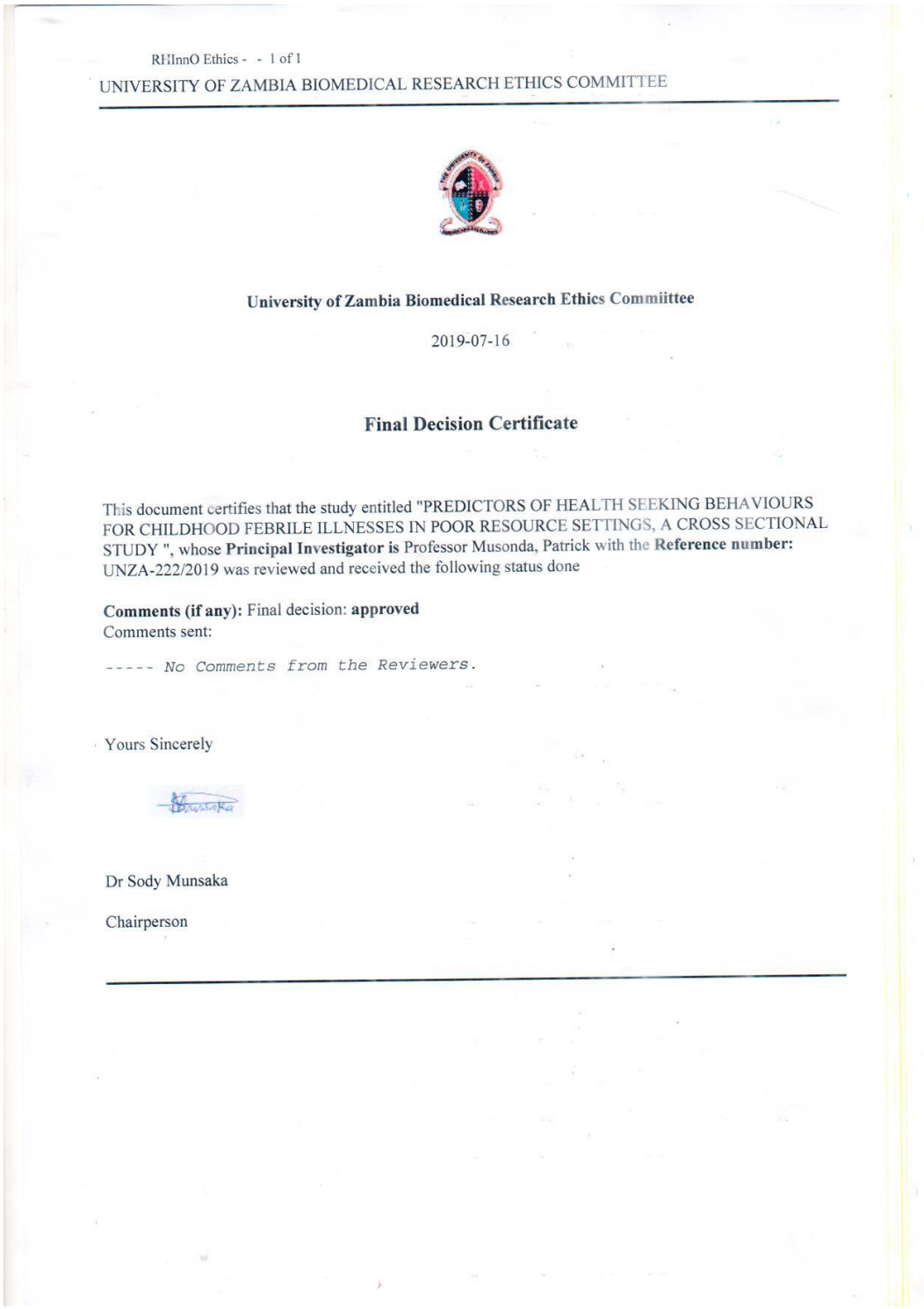
Appendices

1. Ethical clearance letter



RHInnO Ethics - - 1 of 1

UNIVERSITY OF ZAMBIA BIOMEDICAL RESEARCH ETHICS COMMITTEE

University of Zambia Biomedical Research Ethics Commiittee

2019-07-16

Final Decision Certificate

This document certifies that the study entitled "PREDICTORS OF HEALTH SEEKING BEHAVIOURS FOR CHILDHOOD FEBRILE ILLNESSES IN POOR RESOURCE SETTINGS, A CROSS SECTIONAL STUDY ", whose **Principal Investigator is** Professor Musonda, Patrick with the **Reference number:** UNZA-222/2019 was reviewed and received the following status done

Comments (if any): Final decision: **approved**
Comments sent:

----- No Comments from the Reviewers.

Yours Sincerely

Dr Sody Munsaka

Chairperson