



**KNOWLEDGE, BELIEFS AND PRACTICES OF MOTHERS RELATED TO
ANAEMIA IN UNDERFIVE CHILDREN AT KAMUZU CENTRAL HOSPITAL,
MALAWI**

Master of Science (Child Health Nursing) Thesis

By

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Declaration

I, Felistas Mphatso Macheso hereby declare that this thesis is my original work and that I have not submitted it or any part of it for a degree at any other university within or outside Malawi. Work of other people used in this thesis has been acknowledged appropriately.

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Certificate of Approval

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval.

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Dedication

This thesis is dedicated to the Almighty God who has guided me throughout the entire master's program, my husband and my mother for their encouragement and my late father and grandfather who always inspired me to achieve great things in life.

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Abstract

Childhood anaemia is a major health burden which contributes to underfive morbidity and mortality in Malawi. It is estimated that 63% of children in Malawi have anaemia, however, anaemia is preventable. The purpose of this study was to explore knowledge, beliefs and practices among mothers whose underfive children were admitted with anaemia at Kamuzu Central Hospital. The study was cross sectional descriptive and it used both quantitative and qualitative methods. The study recruited 198 participants for the structured quantitative interviews and 12 participants were recruited for the qualitative in-depth interviews. The quantitative data was analyzed using descriptive and Kruskal-Wallis H statistical tests using SPSS version 16.0. The qualitative data was analyzed following principles of qualitative content analysis. The findings revealed that majority of mothers were young mothers within the age group of 20-24 years (41.4%; n=82) and unemployed (44.4%; n=88). The findings also revealed that majority of mothers (59.1%; n=117) had average knowledge related to causes and symptoms of anaemia in underfive children. Anaemia in underfive children was positively related to the education status of mothers ($p = 0.005$) such that mothers with higher education level (college level) had adequate knowledge of anaemia than mothers who had primary or no formal education. The study also found that majority of children had inadequate consumption of food containing iron. In addition, the study revealed that mothers received information related to nutrition from underfive clinics however mothers were not given information related to anaemia. The challenges that participants encountered in accessing health care services for underfive children were long walking distances, lack of medicine and lack of comprehensive screening of children. There is need to educate

mothers on early recognition of signs of anaemia in children to prevent complications; update health workers on nutrition counselling, anaemia checkups and follow up.

Furthermore, there is need for multisectoral collaboration to improve the health and nutrition status of the children.

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List of Abbreviations

CCORE:	Collaboration Centre for Operational Research and Evaluation
COMREC:	College of Medicine Research and Ethics Committee
Hb:	Haemoglobin
HMIS:	Health Management Information System
HSA:	Health Surveillance Assistants
KCH:	Kamuzu Central Hospital
KCN:	Kamuzu College of Nursing
MDG:	Millennium Development Goals
NSO:	National Statistical Office
NAC:	National Aids Commission
NSO:	National Statistical Office
SPSS:	Statistical Package for Social Sciences
UNFPA:	United Nations Population Fund
UNICEF:	United Nations Children Fund
WHO:	World Health Organization

Operational Definitions

- Anaemia:** Haemoglobin level of less than 9.9 g/dl. This is according to WHO (2011) classification of moderate (Hb less than 9.9g/dl) and severe anaemia (Hb less than 7g/dl) for underfive children.
- Beliefs:** The way the mothers look at or feel about anaemia in children.
- Knowledge:** What mothers know about anaemia and this had been reflected on the responses participants gave.
- Mother:** Female caretaker of an underfive child at home and during hospitalization. It can be a biological or surrogate female parent, aunt, grandmother.
- Practices:** What mothers do at home, in terms of feeding practices and health seeking behaviours in relation to childhood anaemia.
- Underfive Child:** Child who is less than 5 years old.

CHAPTER 1

Introduction and Background

Introduction

Childhood anaemia is a major health burden in developing countries. In sub Saharan Africa, it is considered the severe public health problem that contributes to childhood morbidity and mortality (Magalhaes & Clements, 2011). Anaemia is the condition in which number of red blood cells is insufficient to meet the body's physiological needs (WHO, 2011). The cut off points for haemoglobin as recommended by WHO (2011) for children under five years of age is 110g/litre. Based on the estimates from WHO (2008), the prevalence of anaemia is 24.8% globally and the highest rates are found in underfive children in Sub Saharan Africa (67.6%). In Malawi, 63 % of underfive children are anaemic (NSO & ICF Macro, 2011).

The prevalence of anaemia in underfive children is a combined result of the increased iron requirements due to rapid growth, early weaning, low availability of foods rich in iron and dietary monotony. Furthermore, unfavourable socioeconomic conditions make children more vulnerable to diarrhoea, respiratory infections and intestinal parasites, and may markedly compromise intake, absorption and biological utilization of iron (Santos et al., 2011).

There are some maternal factors which also contribute to development of anaemia in underfive children for example education status and socioeconomic status. Several studies found that mother's low educational background and poor economic status were

associated with low haemoglobin levels in children (NSO & ICF Macro, 2011; Santos et al., 2011; Leal, Batista Filho, Lira, Figueiroa, & Osório, 2011). Underfive children from poor backgrounds and/ or with poorly educated mothers are more prone to anaemia due to inappropriate feeding practices, lack of nutrients, recurrent illness and poor access to health services. This supports the public health value of the World Health Organization millennium development goals of universal primary education for women and eradicating poverty in order to improve the health status of children (Habte et al., 2013).

Mothers are primary caretakers of children during the first years of life; their knowledge and health related behaviours could influence the health status of children. This study therefore aimed at exploring knowledge, beliefs and practices of mothers of underfive children with anaemia. The study was conducted at Kamuzu central hospital where most children within central region are referred therefore more mothers were easily accessible for the study.

Background

Anaemia is one of the major conditions which affect underfive population. It causes major health problem in underfive children and it is associated with increased risk of death, impaired cognitive function, growth and psychomotor development and impaired immune system function (Magalhaes & Clements, 2011). Children under five years of age, have greater susceptibility to anaemia because of their increased iron requirements to meet the rapid body growth and expansion of red blood cells (Santos et al., 2011). The onset of anaemia is common in infants after their fourth month, because by this age, the iron stores are depleted (Nnakwe, 2011).

There are many causes of anaemia in children but the main contributors are malnutrition, infectious diseases and inherited hemoglobinopathies (haemoglobin disorders). Infectious diseases that cause anaemia include malaria, HIV, bacteraemia that is caused by streptococcus pneumoniae, salmonella species and hemophilus influenza, and helminth infections caused by hookworm and schistosoma hematobium (Magalhaes & Clements, 2011).

The major micronutrient deficiency that contributes to anaemia is iron deficiency; other micronutrients are vitamin A, vitamin C, and folate (Magalhaes & Clements, 2011). Bad feeding habits in early childhood, especially during the weaning period, exacerbate the problem. Anaemia frequently develops as breast milk is replaced by foods that are poor in iron and other nutrients, including vitamin B12 and folic acid (Santos et al., 2011). Studies conducted by Yang et al. (2012) and Kikafunda, Lukwago and Turyasemererwa (2009), found that inappropriate feeding practices were significantly associated with anaemia. It was also found that children who were introduced to complementary foods before 6 months and children with prolonged exclusively breastfeeding over 6 months old had higher rates of anaemia. Iron that is available in breast milk can only sustain the child from birth to 6 months. Therefore, it is recommended to exclusively breastfeed an infant for the first six months of life. However, gradual introduction of iron enriched solid foods should complement breast milk starting from 6 months of age (Olufemi, Gbadamosi, Akinrinmade, & Oladapo 2013).

A study conducted in Blantyre and Chikhwawa districts in Malawi on the pathophysiological mechanism of severe anaemia found that iron deficiency was the main cause of anaemia in 46.4% of the underfive children (Boele van Hensbroek et al., 2010). The study also found that 15.9% of children who had severe anaemia were wasted, and 53.2% were stunted. This also shows that apart from infections, nutrition deficiencies also plays a part in causing anaemia in underfive children in Malawi. Infants with anaemia caused by iron deficiency have lower mental scores and lower motor scores than infants without anaemia. Therefore, it is critical to ensure sufficient iron levels in the first months and years of life (UNICEF, 2009).

Mother's knowledge of anaemia is significantly associated with reduced risk of anaemia in children. This is evident in several studies that found that mothers' knowledge of anaemia was significantly associated with lower odds of anaemia in children, child consumption of iron rich food and fortified milk and iron supplementation during pregnancy (Kikafunda et al., 2009; Souganidis et al., 2012). On the other hand, children of mothers with low knowledge of anaemia have a 12-fold prevalence of anaemia compared to mothers with high knowledge (Bilenko, Yehiel, & Gazala, 2007).

Some cultural factors also contribute to anaemia in children. In Iran, it was found that some families were not giving red meat to children with a belief that red meat will make their children ill or introduce worms in children. Other Iranian tribes were also paying more attention to boys than girls in regard to feeding choices and food quantity and these cultural practices resulted in high prevalence of anaemia in girls than boys (Keikhaei, Zandian, Ghasemi, & Tabib, 2007). This is also similar to Pakistan, in many Pakistan families the boy child is preferred over the girl child and with this gender bias,

and the male child is given sufficient food (in quality and quantity) as compared to the girl child. This therefore deprives the girl child from essential nutrients leading to vicious cycle of malnutrition and anaemia (Hirani, 2012).

On the home management of childhood anaemia, similar practices were identified in mothers from Cameroon and Nigeria. Most of the mothers gave their children over the counter medications which included iron tablets and herbal remedies while few mothers consulted the physicians (Olufemi et al., 2013; Sumbele, Samje & Akenji, 2013).

According to Olufemi et al. (2013), mothers believed that these practices would enable them meet iron requirement of their children.

On the contrary, the mother's practices of using herbs was promoting the development of anaemia in children because herbs containing anti-nutritional factors such as tannin and phytate prevent the absorption of iron in the body hence leading to development of anaemia in children (Olufemi et al., 2013).

According to the survey conducted by the Ministry of Agriculture (2009), most of the women in Malawi (88.1%) reported to have heard about anaemia. However, there were significant differences in knowledge by education level; knowledge increased significantly with level of education. Despite most women having knowledge about anaemia, there was lack of preventive measures for diseases that greatly contributes to anaemia for example malaria and bilharzia. On the prevention of malaria and its complications, the NSO & ICF Macro (2011), found that only 47% of children slept under insecticide treated mosquito nets. The survey also showed that the central region had the lowest rates of children who received deworming medication.

Problem statement

According to Malawi demographic health survey (2010), 63 % of underfive children are anaemic. Twenty five percent (25%) of the children have mild anaemia, 36 % have moderate anaemia, and 3 % have severe anaemia. Children living in rural areas have high rates of anaemia (64%), compared with children in urban areas (53 %). There is also regional variation of anaemia in children, with the central region having the highest rates of anaemia.

At Kamuzu Central hospital, the HMIS data for January to December (2013) indicated that 1,405 (6.4%) of children admitted at the hospital presented with moderate and severe anaemia. In some of the children, the diagnosis of anaemia was made after admission to the hospital due to other health complaints. This shows that anaemia is not recognized early and is not given a significant priority by caretakers. Studies conducted in Malawi on anaemia have focused on the prevalence of anaemia in underfive children (Boele van Hensbroek et al., 2010, NSO & ICF Macro, 2011) and there is scarcity of studies related to knowledge, beliefs and practices of mothers in relation to childhood anaemia. This study will therefore help to address this information gap. This study therefore aimed at exploring mothers' knowledge, beliefs and practices related to anaemia in underfive children in order to discover factors that contribute to underfive child morbidity and mortality rate.

Justification of the study

Most of the recent studies that were conducted in Malawi on anaemia have concentrated on groups of people such as school-aged children and pregnant women. There are few studies that have concentrated on the underfive population. This study will therefore help to provide recent information on knowledge, beliefs and practices that mothers have related to anaemia in underfive population.

The findings of the study may also help to identify the gaps in knowledge and practices that mothers have related to childhood anaemia. The discovery of gaps may help policy makers and hospital management teams in creating programs that could strengthen information, education and communication to ensure prevention of anaemia and its complications, thereby reducing anaemia related morbidity and mortality in underfive children.

Aim of the study

The aim of the study was to explore knowledge, beliefs and practices among mothers whose underfive children were admitted with anaemia at Kamuzu Central Hospital.

Specific objectives

1. To assess mothers knowledge on the causes of anaemia in underfive children
2. To assess mothers knowledge on nutrition provided to underfive children in order to prevent anaemia
3. To identify mothers' practices that could contribute to anaemia in underfive children
4. To identify mothers' cultural and religious beliefs that would contribute to anaemia in underfive children

CHAPTER 2

Literature Review and Conceptual Framework

Introduction

This section discusses studies that have been conducted in relation to maternal knowledge, beliefs and practices related to anaemia in underfive children. However, there is limited information related to the topic because more studies have concentrated on the prevalence of anaemia in underfive children. The review of literature was guided by the objectives for the study and some of the concepts of the health belief model. Literature review in this study mainly focused on the knowledge of mothers related to the concept of anaemia, causes and symptoms of anaemia, mothers knowledge and practices related to nutrition for underfive children that can contribute or prevent anaemia, cultural and religious beliefs of mothers that can contribute to anaemia in children. Some concepts of the health belief model that have been applied in the literature review include modifying factors, barriers to quality health care services for underfive children with anaemia and cues to action related to health behaviours of mothers of underfive children with anaemia. Literature review was done through rigorous search from books, journals internet and published theses at Kamuzu College of Nursing (KCN) library. Internet search engines included the Google Scholar, WHO websites, maternal child health journal, PLoS one, Hindawi and BioMed Central. The key words which were used during the literature search were; the health belief model, anaemia in underfive children OR childhood anaemia, knowledge on anaemia, cultural beliefs AND anaemia, religious beliefs AND

anaemia, practices related to anaemia, nutrition AND anaemia, barriers AND anaemia, cues to action AND anaemia.

The health belief model

The study used the health belief model because the model attempts to explain and predict health behaviours of individuals hence suitable in predicting knowledge, beliefs and practices of mothers towards childhood anaemia. The practices of mothers in relation to anaemia in underfive children can also be influenced by several factors and the model attempts to explain some of these factors. Its prediction for individuals to take preventive action against a particular disease is also of importance.

The health belief model was developed in the early 1950s by social psychologists at the United States public health service in an attempt to understand the widespread failure of people to accept disease preventive measures or screening tests for the early detection of asymptomatic disease (Janz & Becker, 1984).

The model proposes that a person's health related behaviour depends on the person's perception of four critical areas which are; the severity of the potential illness, the person's susceptibility to that illness, the benefits of taking a preventive action and the barriers to taking that action (Current Nursing, 2012). The model postulates that health-seeking behaviour is influenced by a person's perception of a threat posed by a health problem and the value associated with actions aimed at reducing the threat.

Elements of the health belief model have been summarized in figure 1.

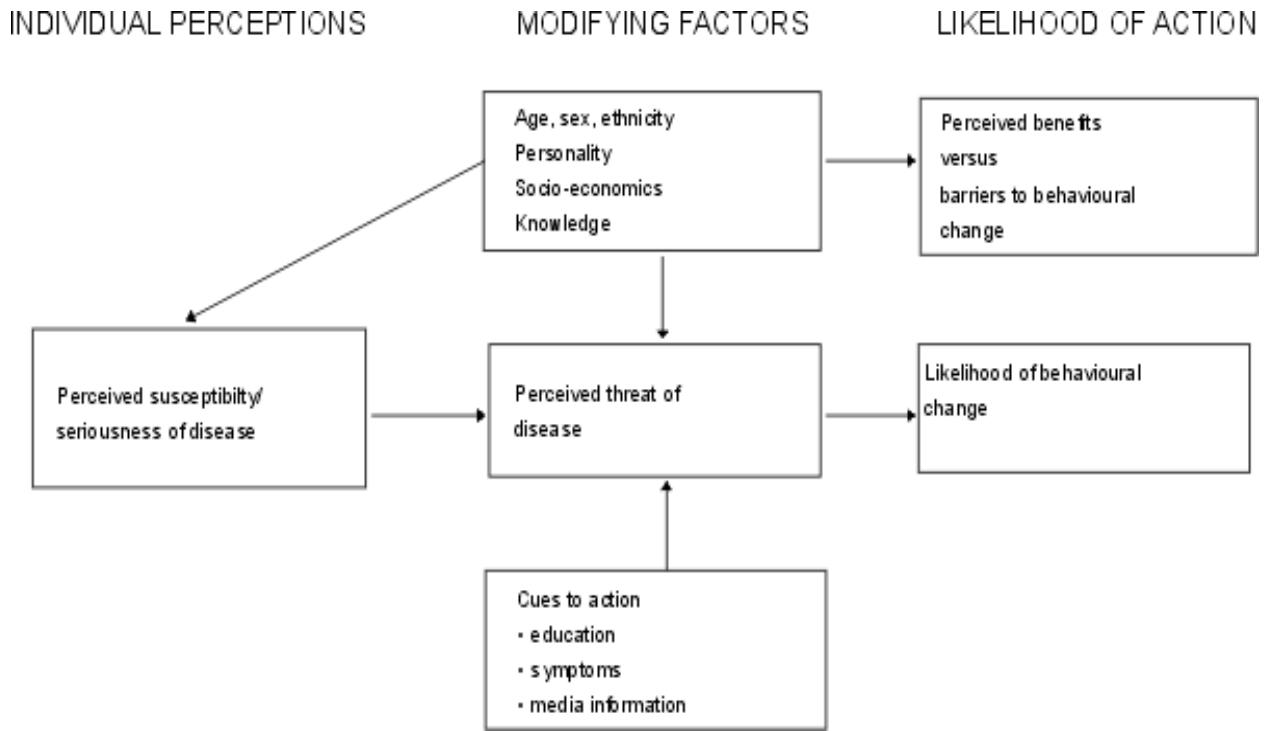


Figure 1: The health belief model, Source: Glanz et al. (2002)

Concepts of the health belief model

Perceived susceptibility refers to person's perception that the health problem is personally relevant or that the diagnosis of illness is accurate (Current Nursing, 2012). If the perceived risk is great, there are high chances of engaging in behaviours to decrease the risk (Hayden, 2009).

Perceived seriousness/severity refers to a person's feelings of how serious it is to contract an illness or disease or leaving the illness or disease untreated (Hayden, 2009).

Perceived benefits refer to a person's perception of the effectiveness of various actions available to cure or reduce the threat of illness or disease (Boston School of Public Health, 2013).

Perceived barriers refer to a person's feelings on the obstacles to performing a recommended health action (Boston School of Public Health, 2013). Examples of barriers include poor socioeconomic status, time and long distances to reach to the health facility.

Modifying factors are individual characteristics that influence personal perceptions. Examples of the modifying factors are culture, educational level, past experiences and age (Hayden, 2009).

Cue to action are stimulus needed to trigger the decision-making process to accept a recommended health action (Boston School of Public Health, 2013). These cues can be advice from others, illness of family member, mass media campaigns or media reports (Hayden, 2009).

Application of the health belief model

The modified health belief model has adopted four concepts of the model to guide this study and these are; perceived susceptibility, modifying factors, perceived barriers and cues to action. For the applied concepts of the modified health belief model refer to figure 2. The study concentrated on the stated 4 concepts of the health belief model because they provided guidance in discovering more information related to factors that contribute to anaemia in underfive children. The study was not an interventional study hence the omission of the perceived benefit and behavioural change.

Certain individual/modifying factors for example poor socioeconomic status of mother can lead to development of anaemia in children. Due to lack of income, mothers cannot afford to buy the required food for their children and this can lead to inadequate

dietary intake in children leading to several nutritional deficiencies which includes anaemia and malnutrition.

The age of the mother can also be a risk factor for childhood anaemia; for example teenage mothers can lack the proper knowledge and skills for childcare in terms of required nutrition to give their children and this can also lead to anaemia in children.

Due to lack of information related to nutrition and childhood anaemia, mothers may not perceive that their children are at risk of anaemia and they may not appreciate the importance of giving their children required nutrition to prevent anaemia (Figure 2) and this can lead to development of anaemia and its complications.

Most mothers have a tendency of taking their children to hospital early upon recognizing life-threatening conditions for example fever and convulsions. On the contrary, anaemia does not present with danger signs in its early stage and this can make mothers not to perceive it as a serious condition. Mothers can obtain information on anaemia through various sources (Figure 2) and this can help in the improvement of child nutrition, prevention of anaemia and early recognition of anaemia in children (Figure 2). However, barriers from both the community and the health care setting can prevent mothers from practicing preventive measures of anaemia and from early reporting to the hospital (Figure 2).

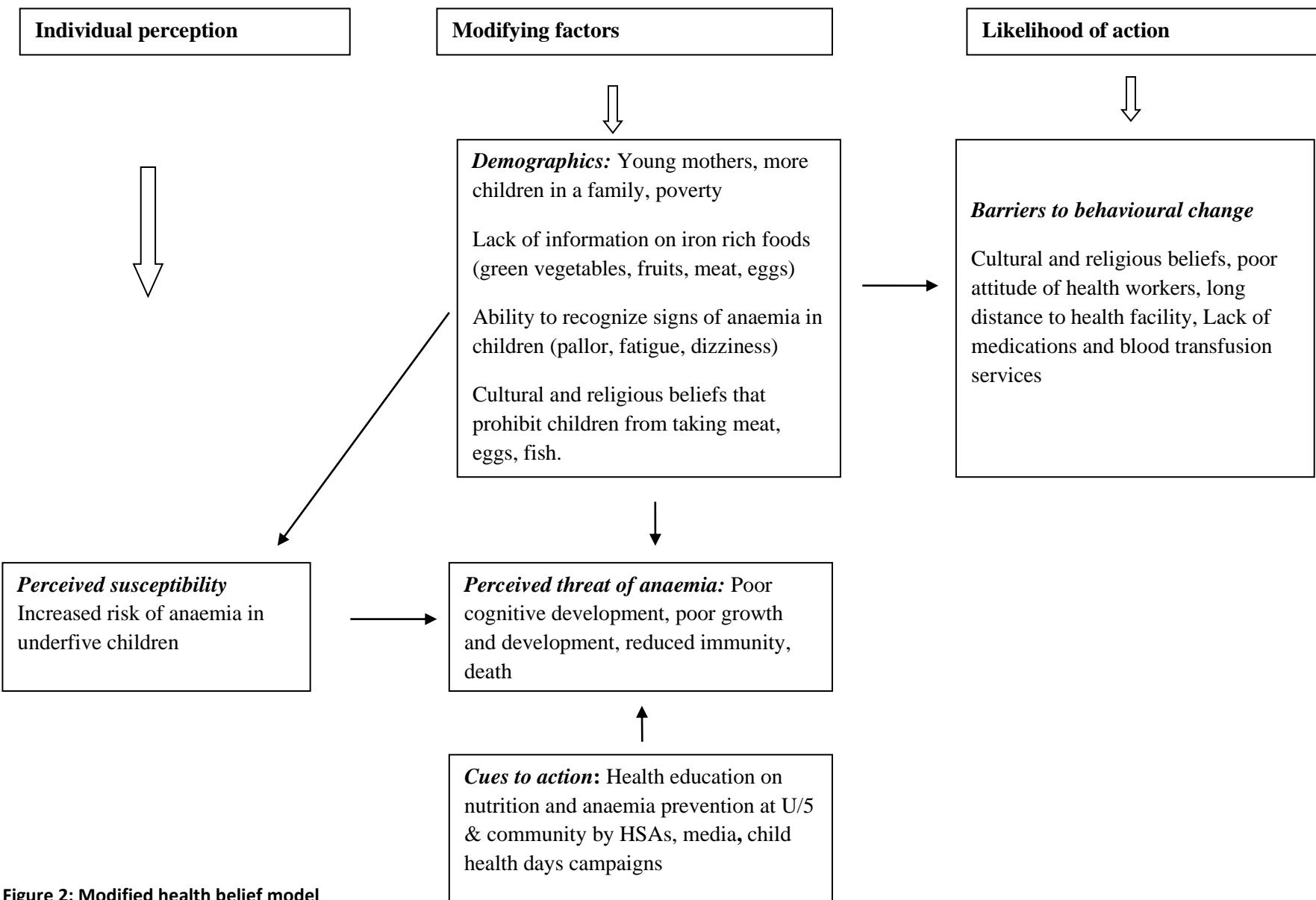


Figure 2: Modified health belief model

Factors contributing to anaemia in underfive children (modifying factors)

Some of the modifying factors related to anaemia in underfive children which have been identified in several studies include the age of the child, birth order, mother's age, high maternal parity, education level of the mother and socioeconomic status of parents. These factors also influence child care practices and health seeking behaviour of mothers on their children.

The observed association between child's age and anaemia has been reported in several studies (NSO & ICF Macro, 2011; Aemro et al., 2013; Leite et al., 2013; Ewusie, Ahiadeke, Beyene & Hamid, 2014). Among the underfive children, children under 2 years of age have higher prevalence of anaemia than their counterparts and this is because at this age children experience high rates of growth which increases demand for micronutrients such as iron, folate and vitamin B12. The introduction of foods with low iron levels during weaning and elevated frequencies of infections and parasitic disease in young children are also important factors that contribute to childhood anaemia (Leite et al., 2013). In a study conducted by Aemro, Messele, Birhanu and Atenafu (2013) results showed that age of the child was significantly associated with dietary diversity with children aged 6-11 months being given adequate diet compared to children aged 12 to 23 months. In Ethiopia it was found that younger children were more anaemic than older children and anaemia gradually decreased as the child got older. Children aged 6 to 23 months were the most at-risk group in which the risk was almost 3 times when compared with those of 48 to 59 months. This may be attributable to lower iron requirements per

kilogram body weight associated with decreasing growth rate and the shift in diet from complementary foods to table foods (Gebreegziabiher, Etana, & Niggusie, 2014).

Birth order was also found to be an important determinant of micronutrient problems with children who were third born having nearly 2 times more risk of being fed inappropriately compared to the first born children (Aemro et al., 2013). Similarly, Baranwal, Baranwal and Roy (2014) found significant odds of anaemia in the third birth order. According to Aemro et al. (2013) when there is increased number of children in a family and when there are more underfive children there is increased burden on the mother to feed her child appropriately and this may in turn contribute to Macronutrient and micronutrient deficiencies in children.

Socioeconomic status is another factor that influences the nutritional status and haemoglobin levels of underfive children (Souganidis et al., 2012). Aemro et al. (2013)'s study revealed that children from the richest households had 74% less chance to have inadequate nutrition and diet diversity compared to children from the poorest household. NSO & ICF Macro (2011), states that haemoglobin level below 8g/dl is highly associated with wealth status decreasing from 11% of children in the lowest wealth quintile to 5% of children in the highest quintile. This is due to the reason that children from poor households are less likely to get iron-rich foods like animal foods and vitamin-rich foods especially vitamins A and C which are very important for iron absorption. In addition to these poor households are less likely to afford health service during illness (Gebreegziabiher et al., 2014).

Mother's education status also plays a role in contributing to child's anaemic status. According to Malawi demographic survey health (2010), it was found that anaemia among children decreases with an increase in mother's education and in wealth quintile. It was concluded that female literacy affects the child's life expectancy and nutritional status. Similarly, Habte et al., (2013) found that children whose mothers had no formal education were 1.38 times more likely to have childhood anaemia than their counterparts. This also correlates with the study that was carried out by Leal et al. (2011) who found out that the prevalence of anaemia was lower among children whose mothers attended school for more than eight years. In Kenya, the level of education among mothers influenced the feeding practices used with mothers who had the higher level of education having better acquisition and use of nutrition education (Shihundu, 2012). According to Habte et al. (2013) under five children from poor backgrounds and/ or with poorly educated mothers may be more prone to anaemia due to inappropriate feeding practices, lack of nutrients, intercurrent illness and poor access to health services. This shows that education provides to mothers the capacity to grasp knowledge needed for adequate healthcare and nutrition for children (Leal et al., 2011).

Maternal anaemia is consistently associated with the occurrence of childhood anaemia; this is because mothers and children often share a home environment which involves mutual exposure to a common set of physical, socioeconomic and dietary conditions (Leite et al., 2014). The high prevalence of anaemia in underfive children can also be due to maternal micronutrient deficiency since children born from malnourished mothers have poor stores of iron, zinc, Vitamin A and folate; the low concentration of iron in breast milk may be insufficient to meet the daily iron requirement for infants

(Ewusie, Ahiadeke, Bayene, & Hamid, 2014). This statement correlates with Leite et al. (2014) and Souganidis et al. (2012) findings that maternal iron deficiency is associated with diminished iron reserves in children and that infants born to iron deficient mothers are more likely to be anaemic and have impaired development.

High maternal parity is another contributing factor to childhood anaemia. According to Cardoso, Scopel, Muniz, Villamor and Ferreira (2012), parity of more than two pregnancies is associated with childhood anaemia because there is poor transfer of iron from mother to child. Other maternal factors associated with childhood anaemia include early onset of childbearing, short intervals between births and poor access to antenatal care and iron supplementation (Cardoso et al., 2012). In addition, Finlay, Ozaltin and Canning (2011) found that children born from teen mothers and children of mothers who have their first birth in their early 20s were at risk of poor health outcomes compared to first time mothers in their late 20s. The study discovered that young age of mothers at their first birth has a biological and social influence that determines the survival of the child. Furthermore Al-Qaoud, Al-Shami and Prakash (2014)'s study revealed that children of young mothers were more prone to anaemia than older mothers and it was associated with mothers experience and child care quality in terms of provision of proper nutrition.

Knowledge of mothers related to anaemia in underfive children

Maternal knowledge of anaemia is associated with lower odds of anaemia in children and with some health behaviours related to reducing anaemia (Souganidis et al., 2012). In Cote d'Ivoire, women were asked to define anaemia in their local language and their conceptual translation was 'blood is over', 'blood is decreased', 'there is no insufficient blood' and 'blood is lacking' (Kouadio et al., 2013), this shows that women had different views and knowledge concerning the concept of anaemia. In Sri Lanka only 74% of the mothers reported to have heard or known about anaemia as shortage of blood and others (26%) did not know about it.

The majority of the mothers reported that iron helps the baby to be healthy (70%) but only about 16% knew that iron tablets reduce anaemia/iron deficiency (Peiris & Wijesinghe, 2010). According to the survey conducted by the Ministry of Agriculture (2009) the majority of the Malawian women (88.1%) reported to have heard about anaemia. However, there were significant differences in knowledge by education level. Knowledge increased significantly with level of education. However, Indian mothers were found to have poor knowledge on underfive nutritional problems including anaemia and its prevention (Shettigar et al., 2013).

On the knowledge concerning the causes of anaemia, the most common causes of anaemia that were reported by women in Malawi were lack of food and illness/disease (Ministry of Agriculture, 2009). However in Cote d'Ivoire women had cultural taboos related to anaemia, they believed that sun, fire, hard work, diet (oily foods), ill health, malaria and mosquitoes can cause anaemia (Kouadio et al., 2013). Few women reported schistosomiasis, intestinal worm, HIV/AIDS and lack of hygiene as causes of anaemia.

Most women mentioned that diet can cause anaemia. Kouadio et al. (2013) also found that rural women believed that witchcraft might trigger anaemia. Another study conducted in Cameroon by Sumbele et al. (2013) found that approximately 75.5 % of the caregivers had some knowledge about anaemia and the majority of caregivers recognized pallor as the only symptom of anaemia.

In Indonesia, maternal knowledge of anaemia was significantly associated with iron supplementation during pregnancy and child consumption of fortified milk. However, there was no association of maternal knowledge of anaemia with child deworming. Health behaviours that were found to reduce anaemia were deworming of the child, presence of an improved latrine in the household, greater consumption of plant source and animal source foods rich in iron content, and high quintile of per capita household expenditure (Souganidis et al., 2012).

Maternal knowledge and practices related to nutrition for the underfive child

Mothers are primary caretakers of the children during their first five years of life; as such maternal knowledge on nutrition plays an important role in the health status of the child. Various studies report that mothers' nutritional knowledge has positive effects on child nutrition (NSO & ICF Macro, 2011; Yang et al., 2012). On the other hand, lack of knowledge of mothers on the required iron containing food that should be given to underfive children is one of the contributing factors to anaemia. Yang et al. (2012) found that inappropriate feeding practices due to lack of knowledge on required nutrition for children were significantly associated with anaemia.

Yang's et al. (2012)'s study also found that lack of exclusive breast-feeding during the first 6 months of life and prolonged exclusively breastfed feeding over 6 months old was associated with anaemia. Another predictor of infant anaemia that was found in the study was the frequency and quality of complementary foods. In Malawi, it was found that among children aged 6 to 23 months, only 19 % are fed according to infant and young children feeding practices, it was revealed that food made from grains are consumed more often than foods from any other food groups (NSO & ICF Macro, 2011). These findings are similar with Nepal diet whose children's complementary food lacks variety and are often based on cereals like rice and dal. Meat, fish or eggs are infrequently given to children and green leafy vegetables are considered cold and are not given to children (Adhikari, 2010). On the other hand, meat, fish and liver are excellent sources of heme iron and they enhance non-heme iron absorption (Olufemi et al., 2013).

Numerous socioeconomic and cultural factors also influence decisions on patterns of feeding and nutrition status of children (NSO & ICF Macro, 2011). However, meeting minimum dietary requirements for underfive children is a challenge in many developing countries especially in areas where household food insecurity is poor, in most cases children may not be fed frequently enough during the day or the quality of the food may be inadequate (Aemro et al., 2013). This statement correlates with findings from Ethiopia where the proportion of children with adequate dietary diversity was 10.8% and nearly half of the children (44.7%) practiced insufficient meal frequency for complementary food (Aemro et al., 2013). This is also similar to Nepal, where a lot of infants and children suffered from malnutrition and micronutrient deficiencies because their food were mostly infrequent and unsupervised and children suffered from indulgence and

neglect (Adhikari, 2010). In Malawi, the NSO & ICF Macro (2011) also shows that children are given insufficient iron diet; only 21 % of children age 6-8 months and 51% of children aged 12-23 months are given iron rich food. The NSO & ICF Macro (2011) also found that breastfeeding children consumed less iron-rich foods than children who were not breastfeeding. Urban children were found to receive more iron-rich foods than rural children. By region, central region had the lowest proportion of children who consumed iron-rich foods (43%).

In Ethiopia, mothers were slightly knowledgeable on the importance of iron for the child's health. On the knowledge of food diversity and minimum food requirement mothers had moderate knowledge on the initiation of complimentary feeding. Mother's knowledge on the seven food groups that a child should have as a complimentary feeding was also assessed. Mothers mentioned that children should have grains, roots and tuber as a complimentary feeding and few mothers mentioned flesh foods as complimentary feeding. Mothers were also found to have slight knowledge on feeding a child of 6-8 months at least 2 times a day and had moderate knowledge on feeding a child of 9-23 months at least 3 times a day (Berihu, Abera, Berhe, & Kidanu, 2013). Low income, preference to certain foods, food availability from the farm or market at the time was noted as major external set-backs to selecting and preparing food for the children in Kenya (Shihundu, 2012).

Cultural beliefs related to anaemia in underfive children

Different cultures or ethnic groups have different views on the causes of anaemia and the preferred choice of treatment. Culture also influences the food behaviour of people in terms of food choices (Adhikari, 2010) and this can facilitate or prevent

anaemia in children. In Cote d'Ivoire, mothers believed that consumption of meat, Coca-Cola, leaves and prayers were protective against anaemia (Kouadio et.al., 2013) whilst mothers in Kenya believed that other illnesses for example anaemia were caused due to breaking taboos, witchcraft, evil eye and spirit possessed and these were perceived to be best treated by the traditional healers (Abubakar et al., 2013). Mothers also believed that when a child looks pale or white there is something that is drawing the child's blood and the child needs to be taken to the traditional healer (Abubakar et al., 2013). Other cultures in China also believe that children become ill because the ancestral souls miss them.

Therefore, they offer sacrifices to the ancestors to treat their ill children (Research Team of Minzu University of China, 2010). Other ethnic tribes in China also believe that disease is caused due to weakness of the body or ingestion of improper food.

They also believe that the intervention of spirits can also make people unwell so they either take patients to hospital or give them herbal medicine. They also invite sorcerers to conduct exorcisms. If children between 3 or 5 years of age are unhealthy or ill and are unable to recover through modern medical treatment, their parents often take them to the mountains and choose a tree or a stone to be the child's "parents". They pray for their children's health while reciting prayers (Research Team of Minzu University of China, 2010).

In Tanzania, it was found that the Maasai ethnic group had high prevalence of anaemia in underfive children than any other ethnic groups. This was attributed to their traditional diet which is mostly milk and they rarely consume meat, despite having huge herds of cattle and sheep. The Maasai perceives frequent meat eating as a taboo because it endangers stock levels and is considered unwise because it is seen as a form of poor

spending (Mwanziva et al., 2010). The high prevalence of anaemia observed in Maasai community is therefore as a result of the predominance of cow's milk as the main diet including for children less than five years old and it is also because they rarely eat fish, chicken and game meat which is considered a taboo in Maasai culture (Mwanziva et al., 2010).

Some cultural groups in China feed poultry meat to their three months old babies in the hope that they will become eloquent in the future. Fish is given to a 6 months old child and beef to a 12 months old child. Rice soup is given to babies when there is insufficient breast milk and they believe that rice is the most nutritious food. Some of these cultural practices are good for the child who is above 6 months for example giving protein food for example fish and meat as a complementary food. However, some of the practices for example giving rice soup can influence diarrhoea in children and iron in meat cannot be easily absorbed in a 3 months old child due to undeveloped gastrointestinal system (Research Team of Minzu University of China, 2010).

Religious beliefs related to anaemia in underfive children

Religious beliefs influence the health seeking behaviour and choice of treatment for children with anaemia. Some religion also prohibits their members from taking certain types of food for religious and health reasons (Gadegbeku, Wayo, Badu, Nukpe, & Okai, 2013). There are certain foods from protein source which are prohibited to be eaten for religious reasons for example salmons, crawling animals and pork. The pig is considered halaam by Muslims and is also prohibited in Seventh Day Adventist church because it is believed that it possess evil spirits (Gadegbeku et al., 2013). Crawling animals are considered unclean and a sin to eat because they have direct contact with the

ground whereas the salmon is prohibited because it is a scale-less fish, considered as unclean and an imperfect creature in the bible (Gadegbeku et al., 2013). In a study conducted in India, the Hindu and Muslim children showed a high prevalence of anaemia than children from other religious faith and this was attributed to food restrictions from their religious faith (Baranwal et al., 2014). This shows that foods which are prohibited by some religious groups to be taken by its members including underfive children have rich sources of proteins which helps in blood formation and can prevent iron deficiency anaemia in underfive children.

On the influence of religion on treatment seeking behaviours; parents in Kenya preferred taking their sick children for prayers to a faith healer, they reports using prayers, religious signs and symbols, rites, rituals and Quran verses in helping the child to get healed (Abubakar et al., 2013). These behaviours on the other hand could delay prompt treatment for sick anaemic children for example resuscitation and blood transfusion.

In China, people of Islam and Buddhism faith had different perceptions of health and disease. These religious groups believe that sickness can be best healed either through prayers or through application of traditional medicine (Research Team of Minzu University of China, 2010). The religious leader undertakes religious rituals at the sudden onset of disease or if a person has persistent illness. The Muslim attribute illness to Allah, believing that ill health is ultimately a test imposed by Allah; therefore they ask their religious leaders (Imam) to perform a prayer. Other China ethnic groups also practice ancestor worship (Research Team of Minzu University of China, 2010). This shows that religion also influences perception about causes of illness and treatment

seeking behaviours, for example the Muslims parents with sick anaemic child in China will believe that anaemia is caused due Allah testing their faith and will choose prayers as a treatment of option.

Barriers related to health care for children with anaemia

Improved access to adequate health care holds great potential for improved child survival (Adedini, Odimegwu, Bamiwuye, Fadeyibi, & De Wet, 2014). According to Halwindi, Sizya, Magnussen and Olsen (2013), children who live closer to the health facility are more likely to utilize the health services than children who live far away. A study conducted in India by Khalid, Kumari, Mohan, Manar and Singh (2014) found that mothers' main reasons for not seeking care for children with anaemia and other illnesses were transport problem /far distance from health facility (57.1 %), lack of time (17.9 %), and perception that illness was not serious (14.3%).

In Australia barriers that were identified to affect the delivery of health services for infants with anaemia in a rural health centre were linguistic and cultural barriers which included a lack of interpreters and culturally appropriate health education resources. Due to shortage of staff, health workers were also unable to provide continuity of care and effective follow up of infants for example; an infant presenting to the health centre over a number of days could be seen by a different staff member at every presentation. Rarely did infants who presented with an acute illness receive routine or overdue health assessments unless designated child health clinicians saw them. Most non-designated child health clinicians did not view growth assessment, immunisations, anaemia checks or follow-up treatment as their responsibility (Bar-Zeev, Kruske, Barclay, Bar-Zeev, & Kildea, 2013).

Other barriers which compromised service delivery of anaemia care which was, less frequently reported was related to the family's responsibility to attend for care when required for follow-up treatment. Families often spent time away from their home communities; looking for their sick relatives, attending funerals, ceremony or bush holidays and did not present with their infants for planned follow up care. Another barrier which was identified was transport; families were usually dependent on transport provided by the RHC to attend follow-up appointments, as there was no public transport available. At times, there was lack of drivers or vehicles to ferry families to the health centre when required. On other occasions, drivers or clinicians themselves would present numerous times to the families home but they would either not be there or refuse to be transported to the HC because the timing was inconvenient (Bar-Zeev et al., 2013).

In Nigeria, the majority of mothers of underfive children had barriers to accessing health care of their children; these barriers were related to culture, resources and geographical/physical (Adedini et al., 2014). On cultural barrier women had problems in getting permission to seek medical treatment especially for Hausa women who are not culturally allowed to be seen in public and have limited autonomy and freedom of movement and are subject to male dominance and social control. On the resource related barriers mothers mentioned having problems in getting money needed for medical treatment for their children, shortage of health workers and inadequate supply of drugs. On the physical barriers mothers cited an inequality in the distribution of health care facilities (Adedini et al., 2014). Halwindi et al. (2013) also assets that low level of education and cultural barriers make health information and other health related information, education and communication (IEC) inaccessible.

In Zambia caretakers of underfive children mentioned factors which they perceived as barriers that includes; poor quality of health services, unavailability of medicine, financial constraints, weak outreach programmes, bad scheduling of health programmes, poor communication, long distance to rural health centre and low awareness levels of importance of taking children for child health week (Halwindi et al., 2013). The caretakers perceived that quality of care was mainly focused on communication, attitude and efficiency of health workers. The caretakers complained that health workers were not able to explain to them the condition which their children had, the medication that children were receiving and were not given a chance to ask questions concerning child's condition. Caretakers also reported that some of the health workers had negative attitude (unkindness and not respectful) and this made mothers to be reluctant to visit the health facility (Halwindi et al., 2013).

In Malawi, 82% of mothers reported that they have at least one problem in accessing the health facility with their children. Problems that were raised by women included lack of medication at the facility, long walking distances and lack of health workers at the facility (NSO & ICF Macro, 2011).

Lack of communication and information transfer between the health care providers and the mothers is an important barrier to accessing the health services. In a study conducted by (Halwindi et al., 2013) caretakers of underfive children complained of not being informed by health workers the illness that their children were suffering from and the type of medication that were administered to their children.

Cues to action for anaemia prevention

Health related messages can encourage women to improve nutrition for their under-five children hence preventing nutritional deficiencies in which anaemia is one of them and it can also help mothers to recognize signs and symptoms of anaemia early and seek medical attention promptly. According to NSO & ICF Macro (2011), exposure to mass media, common prints and electronic media, newspaper, listening to radio or watching television is important because these sources provides mode of communication on health related topics . In Ethiopia, it was found that only 6.8% of mothers do not watch, listen or read any sort of media, 53.6 % of mothers listen to radio, 36.0 % of mothers watch television and 3.5% reads magazines or news paper whilst only 6.8% do not have any form of media at home (Berihu et al., 2013).

However, in Malawi it was found that only 12% of women read newspaper at least once a week, 16% watch video once a week and 57% listen to radio at least once a week. Overall 5 % of women are exposed to mass media and this is positively related to wealth quintile, 66% of women in the lowest wealth quintile have no weekly exposure to any media source (NSO & ICF Macro, 2011). On the contrary, there was no mother in Cote D'Ivoire who reported TV and radio as the source of information (Kouadio et al., 2013). On the contrary, the mass media was cited as the most common source of information which Indian mothers obtained information about nutritional problems and its prevention (Shettigar et al., 2013). Media can also be used as an effective means of promoting food diversity and meal frequency practices for underfive children. In a study conducted by Aemro et al. (2013), it was found that exposure to media was significantly associated with meal frequency. Mothers with satisfactory exposure to media had 29% less risk of

providing inadequate meal and inappropriate diet for their children compared to mothers with limited exposure to media. Women with limited exposure to media showed an increased risk for suboptimal practices indicating the influence of media in improved feeding practices for children. All in all, Baranwal et al. (2014) highlights the impact of health related messages in which they found that there was a decreased incidence of anaemia among children whose mothers read newspaper, watched television and listened to radio.

Apart from the media, several studies have also cited the health workers as the source for information for mothers on nutrition and anaemia in underfive children (Aemro et al., 2013; Berihu et al., 2013; Kouadio et al., 2013; Kwon, Ramasamy & Morgan, 2013; Shettigar et al., 2013;). According to a study conducted in India, mother's knowledge about anaemia in underfive was obtained from health education programs by the public health care outreach teams.

The outreach teams taught mothers on the healthy diet for children and prevention of anaemia (Kwon et al., 2013). Another study conducted by Shettigar et al. (2013), reports that 18% of mothers mentioned health professionals as the source of information for nutritional problems and prevention. This is also similar to Kouadio et al. (2013) study in which mothers mentioned medical staff from health centre as their main source of knowledge about anaemia. Kikafunda et al. (2009) also found that the health unit was the main source of knowledge on iron for mothers in Uganda. The majority of the mothers in Ethiopia got information of feeding their child from community health worker and nurses/midwives whilst the rest got the information from doctor, health educators, auxiliary midwife, trained birth attendance (Berihu et al., 2013). Aemro et al. (2013) also

found that there was an improved complementary feeding practices of underfive children in mothers who attended antenatal visits compared with children of mothers who had no antenatal visits. This was attributed to nutritional counselling mothers received from health practitioners during the antenatal visits and mothers were likely to take appropriate actions to improve the dietary diversity for their children.

The majority of mothers in Kenya had some form of nutrition education, low nutrition education was observed among 46% of the mothers. However, the basic concepts of nutrition education (food groups, balanced diets and methods of cooking) lacked among mothers. Formal school (90%) was mentioned as a source of nutrition education in Kenya (Shihundu, 2012). In Ethiopia, mother to mother support was also cited as another major source of information for mothers on infant and young child feeding by 32.3 % of mothers (Berihu et al., 2013). Few mothers however, mentioned friends and relatives (Shettigar et al., 2013; Sihundu, 2012), grandparents and elderly (Berihu et al., 2013) and the school (Kouadio et al., 2013) as their source of information.

Summary

The literature review has shown that several studies have been conducted related to knowledge, cultural and religious beliefs and practices of mothers related to anaemia in underfive children. The literature review has revealed that age of the child, education status and socioeconomic status are some of the factors that contribute to anaemia in underfive children. The review also shows that knowledge of mothers related to anaemia and nutrition is associated with reduced prevalence of anaemia in children.

Studies have also shown that mothers perceive that both local and traditional medicine can be used to treat anaemia in children and they were using these medicines for treatment in their children. The literature review also highlighted that cultural and religious beliefs can affect mother's perception of anaemia and influence the health seeking behaviour and choice of treatment. Furthermore, the review also reveals that there are barriers related to health care for anaemic children for example long distance to the health facility, poor quality of health services and mothers perception that the illness is not serious. On the cues to action health workers were cited as the major source of information for mothers on anaemia and nutrition and the least sources were media, family and friends. However, during the literature search, information related to knowledge, beliefs and practices of mothers in relation to anaemia in underfive children in Malawi was scarce and outdated; more literature concentrated on the prevalence of anaemia in children rather than maternal knowledge and practices related to childhood anaemia hence the need to conduct this study. The researcher also encountered problems in searching data for anaemia for underfive children population since more studies concentrated anaemia on other populations for example pregnant women and adolescents hence the need to conduct this study to expand knowledge on childhood anaemia.

CHAPTER 3

Methodology

Introduction

This section discusses research design, study setting, study population, sample size, data collection instrument, data management and analysis, ethical consideration, limitations, time frame, budget and plans for dissemination of the study findings.

Research design

This was a cross sectional descriptive design that utilized both qualitative and quantitative methods in order to examine knowledge, beliefs and practices of mothers in relation to anaemia in underfive children. Triangulation of quantitative and qualitative methods enhanced confidence in the findings of the study and helped the researcher to have deeper and clear understanding of various maternal factors that are associated with anaemia in children. Descriptive study design aimed to explore and describe phenomenon as they naturally happen and it generates new knowledge on the topic where there has been limited research activities (Burns & Grove, 2009).

Study setting

The study was conducted at Kamuzu Central Hospital (paediatric ward). The hospital was chosen because it is located in the central region of Malawi, where according to NSO & ICF Macro (2011), it is the region with high rates of children with anaemia (64%) than northern and southern regions of Malawi (58% and 62% respectively).

Kamuzu Central Hospital was also chosen because it is the referral hospital in the central region and more children with anaemia are referred from various district hospitals and health centres. Conducting research at Kamuzu central hospital helped the researcher in capturing data from mothers from different areas within the central region of Malawi which has the highest number of anaemic children.

Study period

The study was conducted between January 2014 and June 2015.

Study population

The population for the study were mothers of underfive children admitted with a diagnosis of anaemia at Kamuzu Central Hospital in paediatric ward. The mothers were chosen for the study because they were caretakers of children at home and their knowledge, beliefs and practices could influence children's health status. One of the causes of anaemia is iron deficiency, which is a micronutrient problem that can be influenced by caretaker's knowledge, beliefs and practices.

Sample size

Kamuzu Central Hospital had 4,407 paediatric admissions between the months of October 2013 and December 2013. According to the paediatric ward registers, there was a total of 203 underfive children admitted with anaemia in 3 months. However, the proportion of mothers who had knowledge of anaemia related to underfive children was unknown, therefore the sample proportion was estimated at 0.5. Kothari (2004),

recommends use of $p=1/2$ (0.5) if there is no prior information about the population proportion in order to obtain a conservative estimate of the required sample size.

According to Lemeshow, et al. (1990); $n = Z^2 * (P) * (1-P) / e^2$, where; n = sample size; Z = value of a standard normally distributed variable which for a 95% confidence interval takes the value of 1.96; P = proportion of mothers who had knowledge on anaemia; e is the margin of error, which for this study it was set at 7% (0.07).

$$n = (1.96)^2 * 0.5 * (1-0.5) / 0.07^2$$

$$n = 3.84 * 0.5 * 0.5 / 0.0049$$

$$n = 3.84 * 0.25 / 0.0049$$

$$n = 0.96 / 0.0049$$

$$n = 195.91$$

$$n = 196$$

One hundred and ninety six (196) participants was the minimum sample for the study, however the researcher recruited 198 mothers whose underfive children had anaemia for the quantitative approach.

The sample size for qualitative part was determined by data saturation. Data is said to be saturated when no more new information is solicited from subsequent interview (Polit & Beck, 2010). Data saturation was reached after interviewing 12 participants. Therefore the sample size of qualitative study was 12.

Participants for quantitative study were recruited through consecutive sampling. Consecutive sampling is a non-probability sampling in which all eligible subjects are included in the study (Polit & Beck, 2010). Therefore, all eligible and consenting mothers were recruited to participate in the study. However, participants for qualitative survey were selected through purposive sampling.

Participants who demonstrated adequate/good knowledge of anaemia (participants who gave 3 to 4 correct responses related to anaemia) in quantitative study were recruited to participate in an in-depth interview of the study.

Inclusion criteria

The inclusion criterion included mothers:

- With under five years children
- Whose children were admitted to the paediatric ward
- Whose children were diagnosed either with severe or moderate anaemia (haemoglobin level of below 9.9g/dl)
- who consented to participate in the study
- who were fluent in Chichewa or English

Exclusion criteria

The study excluded mothers:

- with children aged above five years
- With children under five years of age but not consented to participate in the study.
- Whose children had sickle cell anaemia

- Whose children had haemoglobin levels of 10g/dl and above
- Whose children were critically ill
- Who were not fluent in Chichewa or English

Data collection

Data collection instruments

The study used two instruments, which were the structured questionnaire and semi-structured interview guide. For quantitative part, a structured questionnaire with close-ended questions was used to obtain information from participants. The questionnaire was developed by the researcher and was based on the literature review and the health belief model (Figure 1 & Appendix E). The quantitative questionnaire had questions that were related to the demographic data of the mother (modifying factors), information of the child, knowledge of mothers related to anaemia in children (For the structured questionnaire, see appendix E). For qualitative part, a semi structured interview guide was used and had open-ended questions. The semi structured interview guide was also developed by the researcher and was based on both the literature review and some concepts of the health belief model (Figure 1 & Appendix G). The qualitative part contained questions related to nutrition of the child, mother's definition of anaemia, cues to action for anaemia prevention, perceived effects of anaemia and perceived barriers for example cultural and religious beliefs of mothers related to nutrition and anaemia in children (For the structured interview guide, see appendix G).

Data collection methods

Data collection was done by the researcher. The interview was conducted in Chichewa and English and only with mothers who were fluent in these languages. Face to face interviews were conducted to obtain information from the participants. Face to face interview entails that an interviewer asks the questions in the presence of the respondent, and also should complete the questionnaire (Robson, 2011).

Validity of the quantitative instrument

Validity is the degree to which an instrument measures what it is supposed to measure (Polit & Beck, 2010). To ensure validity of the instrument, the research supervisors and other paediatric doctors and nurses were consulted to review the questionnaire before data collection. The instrument was also pretested to ensure that it has the required information that needed to be obtained from the participants.

Reliability of the quantitative instrument

Reliability is the consistency with which an instrument measures the attribute (Polit & Beck, 2010). To ensure reliability of the instrument, the instrument was pretested and results helped to change some inconsistencies, some questions were modified and other questions were deleted.

Pretesting of the questionnaire

Pretesting of the instruments was done at Likuni Mission Hospital paediatric ward in order to examine reliability and applicability of the research instruments. The pretesting was also done in order to assess if the instruments had questions that were complicated or ambiguous. Six mothers were involved in the pretesting; 4 mothers were interviewed using questionnaire and 2 mothers were interviewed using the interview guide. Pretesting helped the researcher to refine the questionnaire and interview guide. Likuni Mission Hospital was chosen because like Kamuzu Central Hospital, it is within the central region of Malawi that had high rates of children with anaemia compared to other regions and it admits children with anaemia. Likuni Mission Hospital also refers children to Kamuzu Central Hospital.

Recruitment process for the participants

The researcher approached and established rapport with the nurse in charge for Kamuzu Central Hospital paediatric ward. The in charge was oriented on the study's inclusion and exclusion criteria for selection of participants. The researcher then reviewed the case files for patients in the ward in order to identify mothers of children who met the criteria. The mothers who met the inclusion criteria were then provided with information about the study, which included the risks and benefits for the study. Consent was then sought from individual mothers for their participation in the study. Mothers who were willing to participate in the study signed the consent form and were taken in a private room for interview and were asked questions which were specifically on the questionnaire and/or interview guide.

Data collection process

The researcher ensured that the interview did not disturb the routine care that the child was supposed to receive in the ward. Mothers were approached after ensuring that their children had received the required care and were not approached during routine nursing care, ward rounds or medication times. For mothers who were required to participate in both qualitative and quantitative part of the study, the researcher started with the quantitative part of the questionnaire then qualitative section.

For the quantitative part of the study (questionnaire), the interview lasted for approximately 20 minutes and mothers who are required to participate in both the questionnaire and interview guide were interviewed for approximately 40 minutes. The qualitative interviews were recorded on a tape recorder.

Data management and analysis

Quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) version 16.0. Descriptive statistics were computed for demographic data (age, marital status and level of education, occupation, number of children) and results are presented in form of frequencies, means and percentages. Knowledge of anaemia was determined from frequencies of correct responses on the causes and symptoms of anaemia. Kruiskal Wallis test was done in order to demonstrate the relationship between the demographic variables and knowledge level of participants. Qualitative data was analyzed using thematic content analysis. Data analysis was an ongoing process and was done simultaneously with data collection (Holloway & Wheeler, 2002).

The questionnaires and the interview guide were given coded numbers to ensure confidentiality. Completed questionnaires and tape recorder were kept safe in a locked drawer.

The researcher used the following process as described by Alhojailan (2012), Burns and Groove (2009) Holloway and Wheeler (2002), and to analyze qualitative data:

Transcription of data

Tape-recorded interviews were transcribed word for word then entered and stored in a word document. There was re-reading of notes and listening to tapes for the researcher to become immersed in the data.

Organizing and ordering the data

The researcher was reading the transcribed data line by line. Data was divided into meaningful analytical units. Words, sentences or paragraphs containing aspects relate to each other were grouped together for easy analysis of data. Data was then reduced, paraphrased and summarized and final conclusion was drawn and verified.

Coding and categorizing

The meaningful units of data was assigned and grouped into codes. The main purpose of coding was to make connections between different parts of data.

A category is a group of content that shares a commonality. A category can then be divided into subcategories depending on the level of abstraction.

Building themes

The researcher then developed themes related to the content of the qualitative questionnaire that included; meaning of anaemia, perceived effects of anaemia by mothers, factors related to nutrition and anaemia in underfive children, cultural and religious beliefs related to food and anaemia, methods of food preparation for underfive children, perceived treatment and management of anaemia, barriers to accessing quality health care services and sources of health information related to anaemia.

Trustworthiness of data

Trustworthiness refers to the quality, the authenticity and the truthfulness of findings in qualitative research and relates to the degree of confidence readers have in the results (Schmidt & Brown, 2012). It encompasses several different dimensions which includes; credibility, transferability, confirmability and dependability (Polit & Beck, 2006).

Credibility

Credibility refers to confidence in the truth of the data and interpretations of them (Polit & Beck, 2010). To ensure credibility the researcher made all the questions clear during an in-depth interview so that there was no misleading information during the interview. The researcher also used interview skills for example restating questions and probing more from participants so that the findings should be detailed and comprehensive. Direct quotes from participants were also presented in the analysis to ensure credibility of the findings. The researcher kept an audit trail and finally gave a comprehensive report on the findings obtained from participants through a written report.

Confirmability

Confirmability is the potential for congruence between two or more independent people about data accuracy, relevance or meaning (Polit & Beck, 2010). The researcher presented the information as presented by the participants and there was no manipulation of data. The researcher used a recorder for the in depth interview in order to record participant's response. The findings were then reviewed together with the research supervisors.

Dependability

Dependability means that the study should be consistent over time and that enough observations were made that showed this consistence (Schmidt & Brown, 2012). To ensure consistency, the participants were asked for more information if their answers were unclear.

Pretesting of the interview guide also helped in ensuring consistency of results. Coding checks was also done to ensure that there was agreement within and among the concepts and themes. Dependability allows other researchers to follow the processes used by the researcher in a particular study in order to apply them in their studies. To ensure this the researcher explained all the methods used in the study, data collection tools and findings for the study to ensure applicability to other studies.

Transferability

Transferability is the extent to which qualitative findings can be transferred to other settings (Polit & Beck, 2010). The study provided a clear/ detailed description of the study setting and sample so that the health workers and consumers can evaluate the applicability of the data to other settings and population.

Presentation of the results

The results from the structured questionnaire have been presented using tables (frequencies and percentages), bar graphs and pie charts while the results from the interview guide have been presented using themes and subthemes.

Dissemination of the results

The study findings will be disseminated to stakeholders and health professionals through review meetings, seminars, national and international conferences. Copies of the thesis will be made available to Ministry of Health, Kamuzu College of Nursing, COMREC and KCH. The study findings will also be published in paediatric journals.

Ethical consideration

The proposal was submitted for ethical review and approval at College of Medicine Research Ethics Committee (COMREC) through Kamuzu College of Nursing Research Publications Committee (RPC) to ensure that patient's rights were protected. Permission to conduct the research was sought from the director of Kamuzu Central Hospital and head of paediatric department (See appendices J, K and M for respective approval letters).

The details for the study that include the purpose, procedure, risks and benefits were explained to the mothers who met the inclusion criteria in the local language (Chichewa).

After giving the information about the study, mothers were allowed to make an informed choice of whether to participate in the study or not. Participants who consented to participate in the study signed the consent form by either thumbprint or signature. Participant's right to information, confidentiality, anonymity and privacy was respected. Participants were also informed that they were allowed to ask questions and had the right to participate voluntarily and could withdraw at any point and this was not going to affect their access to care (See appendices A, B, C and D for consent forms in English and Chichewa respectively). To ensure confidentiality, participants' identity was not disclosed and number codes were used on the questionnaires. Only the researcher had access to the information.

Summary

A cross sectional descriptive design with both qualitative and quantitative methodologies were used in order to examine knowledge, beliefs and practices of mothers in relation to anaemia in underfive children. 198 mothers whose underfive children had anaemia were recruited for the quantitative study and only 20 mothers participated in the qualitative study. Data was collected using the structured questionnaire and semi-structured interview guide. Quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) version 16.0.and findings were presented in the form of tables, graphs and charts. Kruiskal Wallis test was done in order to demonstrate the relationship

between the demographic variables and knowledge level of participants. Qualitative data was analyzed using thematic content analysis. Participant's right to information, confidentiality, anonymity and privacy was respected throughout the study.

CHAPTER 4

Presentation of Findings

Introduction

This chapter presents the findings of the study on the knowledge, beliefs and practices of mothers of underfive children with anaemia at Kamuzu Central hospital. The study findings are presented in consistency with the study objectives and some of the concepts of the health belief model. Quantitative results are presented first followed by qualitative results.

Demographic data

Age of participants

A total of 198 mothers of under-five children participated in the study at a paediatric unit at Kamuzu Central Hospital. Most of the mothers who participated in the study were in the age group of 20-24 years of age ($n=82$), followed by age group of 30-34 years ($n=57$). Other participants were within the age groups of 15-19 years ($n=19$), 25-29 years of age ($n=34$), 35-39 years ($n=3$) and above 40 years of age ($n=3$). Figure 3 summarizes the age groups of participants.

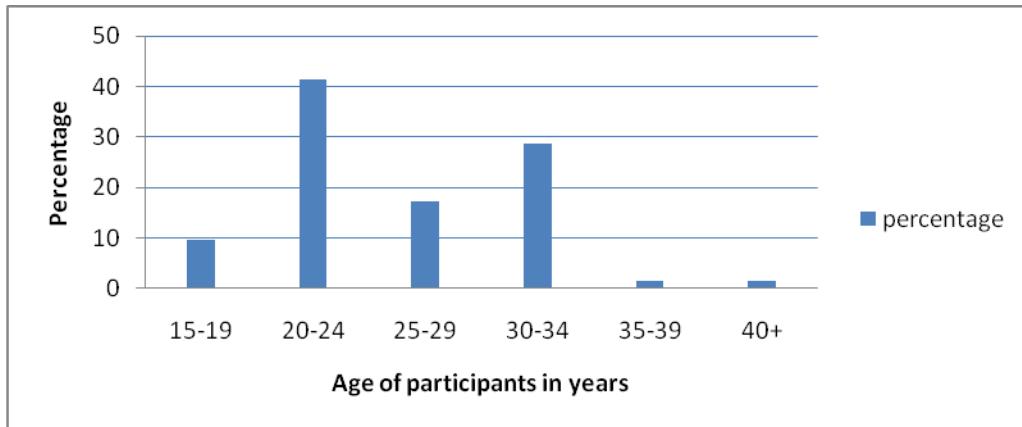


Figure 3: Age of participants

Marital status

The majority of the participants (66.7%; $n=132$) were married, 19.7% ($n=39$) were single, 7.1% ($n=14$) were divorced and 6.6% ($n=13$) were widows.

Denomination

Most of the participants were Christians belonging to CCAP (25.8%; $n=51$), 22.7% ($n=45$) were Roman Catholics, 13.7% ($n=27$) belonged to Pentecostal churches and few participants were of Islamic faith (9.1%; $n=18$). Participants from other denomination for example church of Christ (6.6%; $n=13$), Jehovah witness (4%; $n=8$), Seventh Day Adventist (5.1%; $n=10$) also participated in the study.

Tribe

Sixty one percent of the participants were of Chewa tribe ($n=120$) followed by 18% ($n=36$) of participants belonging to Ngoni tribe, 7% ($n= 13$) were Lomwe participants. Other participants who participated in the study included the Yawo 4% ($n=8$) and the Tonga 1% ($n=2$).

The Chewa represented the largest population of the study because it is the largest ethnic group and common tribe found within the central region of Malawi (NSO & ICF Macro, 2011). Figure 4 shows the tribe of participants.

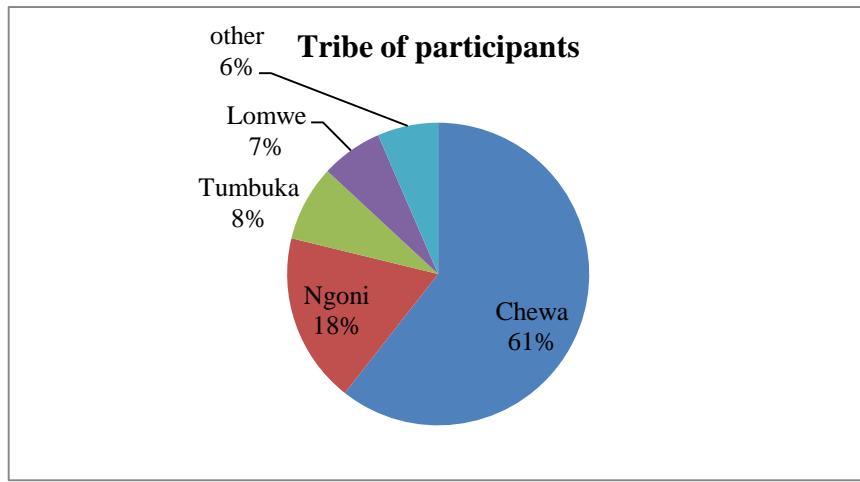


Figure 4: Tribe of participants

Education status of participants

The majority of participants had some form of education with the greatest proportion of participants (81.8%; $n=162$) attaining primary education, 7.6% ($n=15$) having secondary education, 2% ($n=4$) of participants with college education and 8.6% ($n=17$) having no formal education.

Employment status

Most of the participants were unemployed (44.4%; $n= 88$), 9.1% ($n=18$), were employed 23.2% ($n=46$) were self employed and 23.2% ($n=46$) were farmers.

Despite the high percentage of unemployment in mothers, there was an increased percentage (36.9%; $n=73$) of employment in men (husbands of participants). Table 1 presents the employment status of participants and husbands of participants.

Table 1: Employment Status of Participants and their Husbands

Employment status	Mothers		Husbands	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Employed	18	9.1%	73	36.9%
Unemployed	88	44.4%	5	2.5%
Self employed	46	23.2%	36	18.2%
Farmer	46	23.2%	49	24.7%

Information related to the child

Most of the participants (72.2%; $n=143$) had a maximum number of 3 children and only 2% ($n=4$) of the participants had more than 6 children. However, data showed that participants of the age group of 30-34 years (18.1%; $n=36$) had more than 3 children compared to other age groups (refer figure 6).

Data also showed that 45.5% ($n=90$) of the children were within the age group of 13 to 24 months and children of less than 6 months had the lowest percentage 1.5% ($n=3$) of anaemia admissions. The second born children were the most admitted children followed by the first born children. Table 2 shows the information of the children.

Table 2: Information related to the child

Child information	<i>n</i>	%
Number of children		
1-3	143	72.2%
4-6	51	25.8%
7+	4	2%
Age of child		
Less than 6 months	3	1.5%
7-12 months	26	13.9%
13-24 months	90	45.5%
25-60 months	79	39.9%
Birth order		
1	60	30.3%
2	66	33.3%
3	23	11.6%
4	25	12.6%
Other	24	12.1%

Admission due to anaemia

Data showed that 87.9% ($n=174$) of children were admitted for the first time with the diagnosis of anaemia whilst 12.1% ($n=24$) had been previously admitted with a diagnosis of anaemia.

Last anaemia admission

Most children (29.2%; $n=7$) who were previously admitted with the diagnosis of anaemia were admitted within the past 6 months from the present admission. Table 3 shows the time of last anaemia admissions.

Table 3: Time of Last Anaemia Admissions

Last anaemia admission	<i>n</i>	%
3 months ago	5	20%
6 months ago	7	29.2%
12 months	6	25%
Others	6	25%

Knowledge of participants on anaemia

To assess knowledge of anaemia, mothers were asked to define anaemia; mention the causes, symptoms and the effects of anaemia. Knowledge level of participants was rated according to the number of combined correct responses which they gave on the causes and symptoms of anaemia. Participants who gave 0-1 correct response were rated as having poor knowledge, 2 correct responses was rated as average knowledge, 3 to 4 correct responses was rated as good knowledge and more than 4 correct responses was rated as excellent knowledge. The majority of the participants had limited knowledge of anaemia.

Overall knowledge of participants on anaemia

Seventeen percent ($n=33$) of the participants had poor knowledge of anaemia, whilst the greater proportion of participants, (59.1%; $n=117$) had average knowledge of anaemia, 23.2% ($n=46$) had good knowledge of anaemia and 1% ($n=2$) had excellent knowledge of anaemia. Figure 6 shows the overall knowledge level of participants (combined knowledge level of participant's on the causes and symptoms of anaemia).

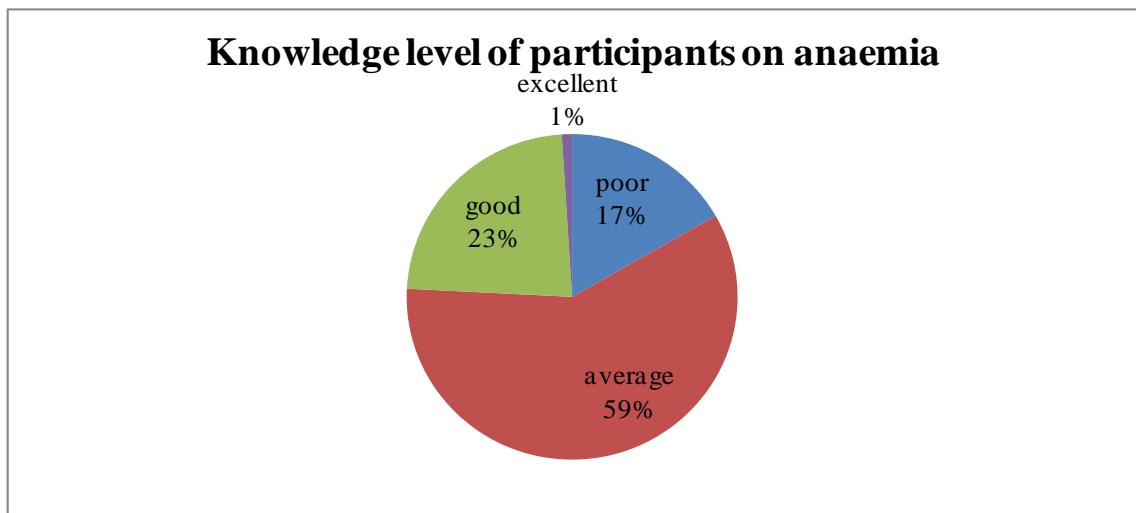


Figure 5: Overall knowledge level of participants

Knowledge of participants on the causes of anaemia

The most common causes of anaemia which were mentioned by participants were poor diet (55.9%; $n=110$) and malaria 22.7% ($n=45$). Bilharzia and hook worm infestation were not mentioned by participants as causes of anaemia. Figure 6 shows the knowledge of participants on the causes of anaemia.

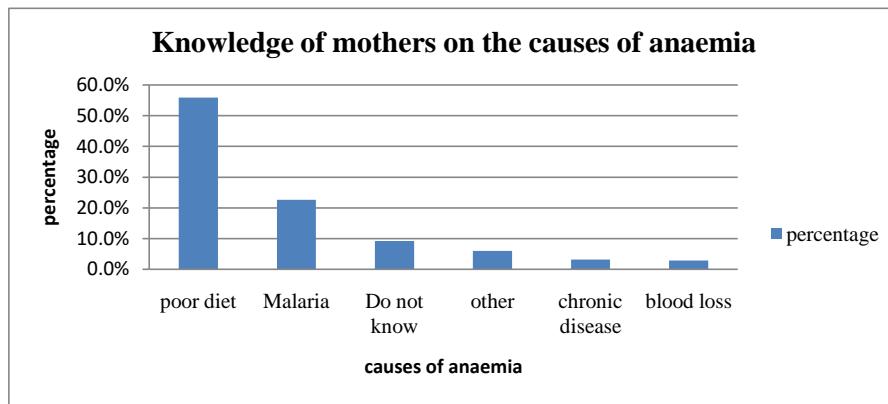


Figure 6: Knowledge of participants on the causes of anaemia

Knowledge of participants on the symptoms of anaemia

Pale skin, conjunctiva or mucous membranes were the most common symptoms of anaemia mentioned by participants (71.9%; $n=142$). Figure 7 presents the knowledge of participants on the symptoms of anaemia.

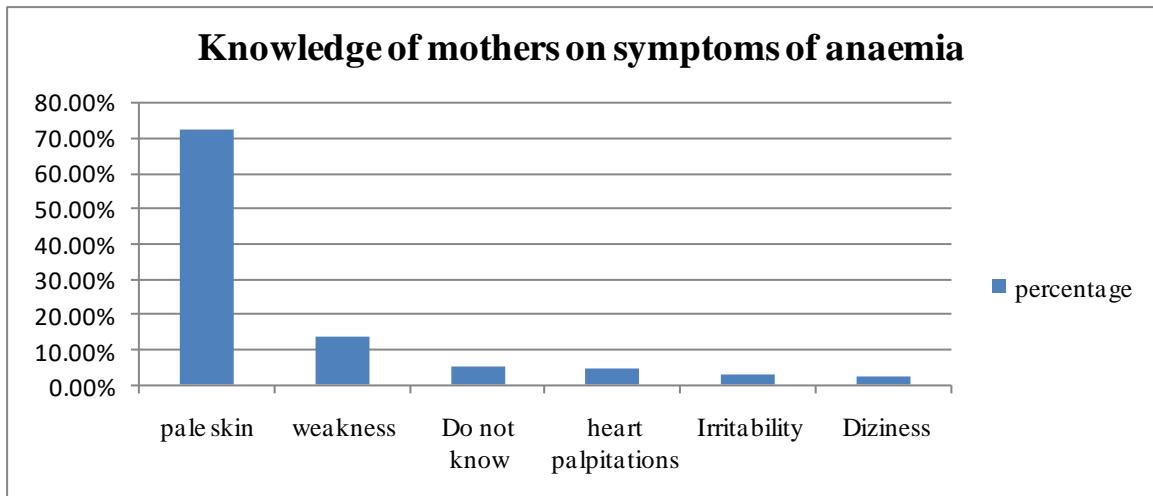


Figure 7: Knowledge of participants on the symptoms of anaemia

Relationship between demographic variables and mothers knowledge of anaemia using Kruskal Wallis test

Kruskal Wallis test was chosen because it provides statistical testing for categorical variables with three or more categories and one continuous variable. In this study the categorical independent variables were demographic data variables for example age, marital status, tribe, denomination, education level, employment status and number of children. The continuous dependent variable was knowledge level which had 4 scores ranging from poor, average, and good to excellent knowledge.

Table 4 shows the relationship between knowledge score mean rank and the demographic characteristics. Among the 8 demographic variables only education level ($p = 0.005$) was statistically significant. Age, marital status, tribe, denomination, employment status and number of children were not statistically significant.

Table 4: Kruskal Wallis H Test results for mother's knowledge in relation to demographic variables

Demographic variable	Chi square value	df	p
Age	8.144	5	0.148
Marital status	1.051	3	0.789
Denomination	6.777	9	0.660
Tribe	4.801	6	0.570
Education level	12.773*	3	0.005
Employment	5.650	3	0.130
Husband employment	2.255	4	0.689
Number of children	0.594	2	0.743

*Variable is significant at 0.05 level

A Kruskal Wallis test revealed a statistically significant difference in knowledge level across 4 different education status of mothers (primary level, $n= 162$, secondary level $n=15$, college level $n=4$, no formal education $n=17$, $X^2 (2, n=198) =12.77$, $p=0.005$). Participants with college level of education recorded higher mean score (185.50) than the other three groups which recorded mean values of primary (97.15), secondary (109.17) and no formal education (93.15). This shows that participants with college level of education who had higher mean score had more/increased knowledge

level of anaemia than their counterparts. Table 5 shows the mean rank for education level of mothers.

Table 5: Mean rank for education level of mothers

Ranks			
Education level	n	Mean Rank	
Knowledge of anaemia	Primary	162	97.15
	Secondary	15	109.17
	College	4	185.50
	none	17	93.15
	Total	198	

The following are themes and subthemes which emerged from the qualitative study

Theme 1: Factors related to nutrition and anaemia in underfive children

- a) Meaning of anaemia (Knowledge of anaemia).
- b) Perceived effects of anaemia by mothers
- c) Low iron intake
- d) Methods of food preparation for underfive children
- e) Source of income for the mother

- f) Cultural beliefs related to food and anaemia
- g) Religious beliefs related to food and anaemia

Theme 2: Perceived treatment and management for anaemia

- a) Traditional/local medicine as treatment for anaemia
- b) Analgesic and antipyretic medication as treatment for anaemia

Theme 3: Barriers to accessing quality health services

- a) Long walking distances
- b) Poor quality of health care services

Theme 4: Sources of health information related to anaemia

Factors related to nutrition and anaemia in underfive children

Meaning of anaemia

The knowledge of participants on the meaning of anaemia on underfive children health status was also assessed. Participants were asked to define anaemia in their own local language. Various definitions were presented by the participants such as reduced blood, inadequate blood, blood drops, drying up of blood and low levels of blood in the body as illustrated by the following quotes: “It means that blood is reduced in the body of the child” (Participants # 1).

“It means that there is inadequate blood in the body” (Participant #28).

“Blood drops in the body” (Participant #23).

However other participants had a different view on the way they described low blood (haemoglobin) level. They defined anaemia as drying up or completely lack of blood in the body.

One participant said “Anaemia means that blood dries up” (Participant #22). Another participant also said “Anaemia means that there is no blood in the body” (Participant #27).

One of the participants though unable to define the condition, associated anaemia with its symptoms. She said” Low blood level is shown by paleness in a child” (Participant #3).

One participant also mentioned that anaemia “Is a serious problem” (Participant #21).

However, fewer than half of the participants did not provide the definition of anaemia, which demonstrated their lack of knowledge on the concept of anaemia.

Perceived effects of anaemia by mothers

Participants were asked to mention the effects of anaemia on the health status of children. The majority of the participants mentioned death as the effect of anaemia which is the end result if anaemia is left untreated. However, few participants mentioned various effects of anaemia. The effects of anaemia as cited by participants included: death, weakness, reduced growth and frequent illness (due to reduced immunity) as illustrated in these quotes: “There are a lot of things that anaemia can cause in a child, the child can frequently fall sick, it affects growth and can even death” (Participant #1). Another participant was quoted saying “Anaemia can cause weakness in a child” (Participant #3).

Majority of the participants linked the symptoms and effects of other diseases/ conditions to anaemia for example participants mentioned effects of malnutrition and malaria as illustrated in the following quotes. “Child can die; can have malnutrition and convulsions” (Participant #33).

“The child develops edema and malnutrition” (Participant # 31).

Low iron intake

Participants were asked on the type of food that they gave their children in 24 hours at home, and the findings revealed that there was lack of adequate balanced diet (low iron intake) poor methods of cooking and insufficient food and money.

All participants reported giving their children porridge in the morning, whilst 2 participants mentioned either giving their children tea or porridge in the morning. There were different types of porridge that were mentioned by participants. Fewer than half of the participants gave their children either soya porridge or mgaiwa porridge with groundnut flour added whilst the majority half of the participants gave their children plain mgaiwa porridge.

The following were examples of porridge which the participants reported to give their children: “I give my child soya porridge” (Participant #3). Another participant reported “I give my child mgaiwa porridge added with groundnuts” (Participant #22). Another participant narrated “I usually give my child plain mgaiwa porridge” (Participant #1).

One participant who had a 6 months old child reported to have given the child white flour porridge which is less nutritious compared to mgaiwa porridge. She narrated “I give my child breast milk more than six times a day and I also give her white flour porridge three times a day” (Participant # 11).

The majority of the participants weaned their children from breast milk whilst fewer than half of the participants were still breastfeeding their underfive children.

Majority of the participants reported that they give their children nsima during lunch and supper. The relish that was commonly mentioned was vegetables (spinach, rape, nkhwani) and beans. Meat, fish, eggs and fruits were rarely mentioned in the diet of children.

This is what the participants narrated:

“In the morning I give my child soya porridge or tea, in the afternoon and evening I give him nsima with vegetables rape or pumpkin vegetables. At 10 am the child is given biscuit or yoggie and at 4pm I give him soya porridge” (Participant #15).

“In the morning I give my child mgaiwa porridge then in the afternoon nsima with vegetables, spinach or nkhwani, sometimes beans or fish. At 2 pm I give him mango or mandasi. In the evening the child takes nsima. Money is difficult to find so I just give my child what is available on daily basis” (Participant #23).

In between the three meals, few participants mentioned giving their children other types of food. One participant stated:

“I give the child food depending on what I have. In the morning I give the child maize meal porridge, in the afternoon the child takes nsima with spinach or pumpkin leaves vegetables, or beef, soya pieces or eggs. In between the child is given mandasi or banana then in the evening I give the child nsima” (Participant # 28).

On the frequency of meals, the majority of the participants gave their children meals 4 times a day, thus three main meals, (breakfast, lunch and supper) and at 4 pm participants children were either given porridge, fruit, sobo, mandasi or yoggie as shown in the Table 6.

Table 6: Frequency of meals (n=12)

Frequency of meals/day	Number of children
6	1
5	1
4	6
3	4

On the frequency which the child is given meals, one of the participants narrated:

“My child eats 4 times a day, in the morning I give my child porridge added with groundnuts, in the afternoon the child is given nsima with beans, or vegetables or eggs. At 4 pm I give my child porridge or fruit either mango or bananas”

(Participant # 22).

One of the participants said that giving the child breakfast is dependent on whether she goes to the garden or not, if she goes to the garden the child skips breakfast and takes lunch and supper only. Thus the child sometimes takes meals 2 times a day. She said that “If I go to the garden in the morning I don’t give the child any food, but when am home I cook porridge or tea for the child” (Participant #21).

Methods of food preparation for underfive children

On the method of cooking, the majority of the participants mentioned boiling relish, fewer than half of the participants were adding either oil or groundnuts flour to the relish.

The majority of participants mentioned that they rarely add oil or groundnuts flour due to lack of money. One participant said “I mostly prepare food by boiling but sometimes when I have money I fry or add oil to the relish” (Participant #3).

However, on the method of cooking vegetables, majority of women mentioned that they boil vegetables for a short time which is good practice. The participants stated that:

“When cooking vegetables, I start with tomato then I add vegetables and I make sure that they don’t stay long on fire in order to prevent destroying vitamins since vitamins helps the child to have good health” (Participant #22).

Another participant said that “I make sure that vegetables do not take long during cooking so that they remain green after cooking” (Participant #1).

However one participant reported that she cooks vegetables until they are soft and this is poor cooking practice, she said “I cook vegetables until they become soft for the child to easily chew” (Participant #21).

Source of income for the mother

Half of the participants mentioned farming as the source of food for the family. Farm produce that were commonly mentioned by the participants were maize, groundnuts and soya beans. Half of the participants had no garden and they said that they buy food through income from either their husbands salary or their own salary or proceeds from businesses.

However, more than half of the participants reported that they have insufficient food and money which do not last the whole year thus having difficulties to provide food for the child and family as illustrated in the following statements:

“My husband is a builder so when he finds work he provides us with money to buy food for the family, sometimes K500-K1, 000 per day. We have a small maize garden but food does not last for the whole year” (Participant #1).

“I sell vegetables and sometimes do manual work to find income to buy food for the family. I have a garden where I plant maize and groundnuts but food is not sufficient for the whole year. The money that I get is also not sufficient to sustain the family for the whole year” (Participant #3).

Few participants mentioned that they give their children food depending on the amount of money and the food that is available. One participant stated “I give my child food depending on the money I have that day and it is hard for me to find food” (Participant #15). Another participant also said “I do not give the child meat because it is expensive to buy” (Participant #22).

Cultural beliefs related to food and anaemia

The majority of participants mentioned that they had no cultural beliefs related to nutrition. However few participants mentioned that they are prohibited to give their children denje (bush okra, Corchorus trilocularis) combined with chidulo (firewood ash). The participants believed that bush okra with fire wood ash added to it could absorb and dry up blood. One participant narrated that: “Children who have anaemia are not given denje (bush okra) with chidulo (firewood ash) added to it because chidulo (firewood ash) contains bitter substance which can absorb the blood” (Participant #21). Another participant said “Our culture denies giving the child denje (bush okra) which have chidulo (firewood ash) because it dries up the blood of the child” (Participant #27).

All the participants from different cultural backgrounds mentioned that their culture allowed them to take children to hospital when they are sick and this is good. One

of the participants said “My culture allows taking child to hospital when sick” (Participant #1).

Some of the participants had cultural beliefs that prohibited children from eating guava and okra. The participants believed that guava affects digestion for children, while okra causes convulsion. One participant stated “my culture prohibits children from taking okra because it is believed that it causes convulsions” (Participant #1). Another participant said “guava is not allowed to be given to children because it disturbs his defecation” (Participant #11).

All the participants also reported that their culture allows them to take herbal concoctions. One of the participants said that:

“My culture allows taking the child to traditional healers and I was told to take my child there but I refused and I opted to take the child to hospital because at the hospital the child is screened for everything” (Participant #27).

Although the participant’s culture allowed herbal treatment, it was noted that only few participants use these medications which include; mlombwa (African taek), chidede (Hibiscus sabdariffa; red sorrel) avocado pear leaves and putting the medicated thread ring on the child’s neck as illustrated in the following quotes:

“People in my culture believe that mlombwa (African taek) and avocado pear leaves can treat anaemia and I have once given my child avocado pear and mlombwa” (Participant #9).

“My culture allows the use of herbal medication and the child has a thread ring on his neck to protect her from diseases” (Participant #11).

In my culture whenever a person has reduced blood he/she is given chidede (Hibiscus sabdariffa; red sorrel); (Participant #1).

Few participants believed that anaemia is caused by witchcraft. One participant said “there are cultural beliefs that witchcraft can cause anaemia and that when this happens we are encouraged to seek traditional healers attention” (Participant #23).

Religious beliefs related to food and anaemia

The majority of participants reported that they had no religious restrictions related to food given to underfive children. However, few participants had some religious restrictions concerning food which was good. One participant said that: “Our religion denies us from eating halaam food, animal that has died on its own and fresh blood of an animal” (Participant #31, African Abraham).

Another participant said that “Our religion does not allow us to eat food which is not halaal” (Participant #21, Islam).

The participants were also asked if their religion allowed a child with anaemia to receive medical care including blood transfusion. The majority of the participants said that their religion had no restrictions towards medical treatment when the child is sick.

Few participants mentioned that they are not allowed to receive blood transfusion. One participant said that “My religion (Jehovah witness) does not allow blood transfusion but allows giving child medications that can increase blood” (Participant #15).

Few participants also mentioned going for prayers before going to the hospital and this could delay child's medical treatment. One participant narrated "My church allows its members to go for medical treatment whenever sick but they pray for you before going to hospital" (Participant #28).

Perceived treatment and management for anaemia

Traditional/ local medicine as treatment for anaemia

The majority of the participants mentioned that traditional medicine can prevent or heal anaemia. One participant said "Yes traditional medicine can prevent anaemia" (Participant #9). Another participant said "Traditional medicine can heal anaemia according to personal faith" (Participant #1).

However, fewer than half of the participants thought that traditional medicine cannot prevent or heal anaemia. One participant narrated "Traditional medicine cannot prevent anaemia but it can just delay the child from receiving medical care" (Participant #33).

Fewer than half of the participants mentioned that they did not know whether the traditional medicine can heal or prevent anaemia. One participant reported "I do not know whether traditional medicine can heal or prevent anaemia" (Participant #15).

Though the majority of the participants mentioned that traditional medicine can treat anaemia, fewer than half of the participants gave their children traditional medicine. Avocado pear leaves, chidede, mlombwa (African Taek) and herbal medicine (unknown)

mixed with coke were mentioned by participants who used these medicines in order to treat their children of anaemia before taking them to hospital.

One of the participants narrated “My husband gave me herbal medication which was added to coke and I gave the child to treat anaemia” (Participant #31). Another participant who also gave her child herbal medicine to treat anaemia reported that she gave the child “avocado pear and mlombwa” (Participant #9).

One of the participants who gave traditional medicine to her child for 1 week reported that the medication did not treat the child’s condition. The following is her narration:

I cannot believe that traditional medicine heals or prevents anaemia. My husband gave me herbal medication which was added to coke and for 1 week I gave the child to treat anaemia but it did not help. I then decided to take the child to hospital (Participant #31).

Analgesics and antipyretics as treatment for anaemia

On the use of medicine bought at the market, the majority of the participants mentioned that they believed that local market medication could heal or prevent anaemia, one participant said: “Yes, medications bought at the local market can prevent anaemia” (Participant # 9). Another participant said “Market medicine can prevent anaemia but with little effect” (Participant #28).

Despite participants belief that traditional medicine could heal anaemia, few participants mentioned using analgesic and antipyretic medications which they thought would treat fever caused by malaria and thought that analgesia also treated anaemia. None of the participants mentioned buying any anaemia related medications at the market. One participant stated that: “I gave my child Brufen and Panado bought at the market after noticing signs of fever and anaemia” (Participant #9). Another participant said “Local market medication can help to prevent anaemia. I give my child Cafemol when he has malaria, because malaria can cause anaemia” (Participant #15).

Another participant reported that “Local medication can prevent a child from anaemia and malaria for example panado and LA” (Participant #23).

Barriers to accessing quality health care services

Long walking distance

The majority of participants reported that they visited the under five clinic for immunizations and when the child was sick. However some of the participants reported that they don't frequently go with their children to under five clinics due to long distances. One participant said “I do not frequently take my child for under five clinics because there are no government hospitals nearby” (Participant #3).

Another participant said:

I attend the underfive clinics with my child but not frequently because the clinic is too far, I walk for 2 hours and sometimes I don't go to the clinic if I do not find anyone to stay with children at home (Participant #31).

Few participants reported that they travelled for less than 1 hour to reach the nearest health facility; however more than half of the participants travelled for more than 1 hour to reach the health facility. One participant said “I go with my child to under five clinic and it is 2 hours walk” (Participant #27).

The majority walked on foot to get to the health facility whilst few participants use public transport or bicycles. One participant said: “I take my child to under five clinic and I walk for 1 hour 30 minutes to reach there” (Participant #11). Another participant said “I use minibus if I have money but if I don’t have money I walk for 2hrs 30 minutes to reach to the hospital” (Participant #3).

Poor quality of health care services

Participants mentioned problems which they encounter when they go to the clinic. Some of the problems which were mentioned by the participants include; lack of medication, no triaging of patients, inadequate checkups, late reporting of health workers for outreach clinics. The following statements illustrate challenges participants encountered in relation to health care services:

“The problem that I face when I go to the clinic is that they do not give priority to sick children, they see children according to who has come first on the line even when the child is very sick”(Participant #28).

There is lack of adequate check up by the clinicians, when my child got sick she was given LA (antimalarial drug) and panado up until I noticed that the child was not improving that’s when I went to a paying hospital there they identified that the child had anaemia and I was referred here (Participant #27)

“We don’t have nearest health centre, so health workers come to conduct outreach clinics and most of the times they come late” (Participant # 31)

“There is lack of medication at the facility; we are only given panado and other medications/ antibiotics they say we should buy” (Participant #22).

Sources of health information related to anaemia

The majority of the participants reported that they heard about nutrition information however fewer than half never heard about nutrition. Half of the participants said that they heard about information related to nutrition from underfive clinic whilst one of the participant heard from health surveillance assistants (HSAs) who visited in the village.

Participants who never heard about nutrition information reported that they were either coming late to underfive clinic or health workers were reporting late for clinic hence no nutrition messages were given to them. One participant complained: “The health workers come late and they start with weighing the child and we don’t receive any health education” (Participant #31). Another participant said “I am always late for underfive clinic due to long distances so I have never received any education concerning nutrition” (Participant #28).

One participant reported that she had forgotten the message she was given at the clinic about nutrition. She said “I have forgotten it has taken long since I went there” (Participant #33).

On the nutrition messages most of the participants mentioned that they were taught on exclusive breastfeeding, food preparation and types of food to give their children. The participants narrated that: “I have received nutrition education at the underfive clinic that we need to give our children fruits and we should add oil or ground nuts flour to the porridge we give children” (Participant #28). Another participant reported “I heard about exclusive breastfeeding at the underfive clinic” (Participant #11).

Another participant said:

“I received health education at under five clinic concerning food that we should give children for example body building food for example sweet potatoes and meat and eggs to make the child grow well and prevent illness” (Participant #23).

Apart from nutrition information participants were also asked about anaemia related information. The majority of the participants reported that they had never heard about anaemia whilst fewer than half of the participants reported to have heard about anaemia.

The participants who had information related to anaemia reported that they received it from the under five clinic, from friends and relatives. The anaemia message the participants heard was on the causes, symptoms and treatment of anaemia. One participant narrated: “I heard about anaemia message at the underfive clinic, that anaemia can be caused due to lack of food and we should give children balanced diet food to prevent anaemia” (Participant #21). Another participant said “I heard from my mother about how to recognize signs of anaemia in a child but I have never heard about its prevention” (Participant #15).

However one participant reported to have heard from friends about the use of avocado pear leaves as the treatment of anaemia; she said “I heard from my friends that avocado pear leaves can be used to treat anaemia” (Participant #9).

Despite receiving nutritional and anaemia related information, mothers demonstrated lack of knowledge on child nutrition and on anaemia. It also show that there is limited source of information as more participants were receiving information during underfive clinics which were group focused not individual focused. Participants also received wrong messages from friends and relatives.

Summary

The study findings have revealed that the majority of the participants were young mothers within the age group of 20-24 years; most of participants were married, with primary education, unemployed and had 1 to 3 children. The study also found that the majority of children presenting with anaemia were within the age group of 13 to 24 months and were the second born children. The findings further revealed that mothers have limited knowledge related to anaemia with 59.1% of mothers having average knowledge. A Kruskal Wallis test revealed a statistically significant difference in knowledge level of different education status of mothers with mothers who attained college level of education recording higher mean score than primary, secondary and no formal education mothers. Among the demographic variables only education level ($p < 0.005$) was statistically significant at $p < 0.05$ level. The study findings also showed that children had inadequate balanced diet with low iron content, parents had insufficient food and money and there was poor methods of food preparation for underfive children.

Furthermore the findings noted that majority of mothers believed that traditional and local medicine can be used to treat or heal anaemia however few mothers used them for their children. The study also found that there were both positive and negative cultural and religious beliefs which mothers had related to anaemia, nutrition and choice of treatment. However, the majority of mothers had no cultural or religious beliefs that restricted children from taking food or visiting the health facility when sick. Barriers that the study found to affect the health care of children with anaemia include long walking distance and poor quality health care. The study also found that there was inadequate health related information for anaemia.

CHAPTER 5

Discussion of Findings

Introduction

This chapter will discuss findings for the study based on the objectives for the study and themes identified on the previous chapter. The discussion of the study will specifically focus on the modifying factors of anaemia (demographic data), knowledge of mothers on anaemia, food given to underfive children, methods of food preparation for underfive children, sources of food and income, treatment of anaemia as perceived by mothers, cultural and religious beliefs related to food and anaemia, barriers related to care for underfive children with anaemia and cues for anaemia prevention. Finally, this chapter will discuss on the limitations for the study, recommendations and areas for further research.

Modifying factors of anaemia in underfive children

The study found that the majority of mothers were married (66.7%). This is similar to NSO & ICF Macro (2011) findings which state that 67% of women (constituting two thirds of women population) were married. The married status of mothers allows provision of social support by fathers to the children in terms of financial support for nutrition and health care. However the study revealed that both children from married and unmarried mothers had anaemia and this was attributed to poor socioeconomic status which made parents not to afford high iron diet for their children.

Forty four percent of the participants were unemployed while the 36.9% of husbands (fathers) were employed. Employment status of parents strongly relates to household income which will eventually affect health outcome of children.

Fathers' occupation affects their effort to generate income for the family and therefore affects a family environment in areas of nutrition, housing among others which contribute to nutrition deficits, infections and injuries which could be of immense benefit to children (Borbor, Kyereme, Yendaw, & Opong, 2014).

The current study also revealed that mothers within the age group of 20-24 years had a higher proportion of children with anaemia (82 children) compared to their counterparts. Al-Qaoud et al. (2014), concurs with the study findings and assets that children of young mothers are more prone to anaemia than older mothers and this is associated with mothers experience and child care quality in terms of provision of proper nutrition. The current study also found that there were more second born children with anaemia followed by the first born children. However, these findings are contrary to study findings of Finlay et al. (2011) who found that first born infants of mothers in their early twenties had higher risk of moderate and severe anaemia.

Among the under-five children, the study found that children who were within the age group of 13-24 months had the highest rates of anaemia compared to other age group. This is the age when children are completely weaned from breast milk and they mostly eat the available family food. Kikafunda et al. (2009)'s study findings indicate that the highest prevalence of anaemia was in children aged 13 to 24 months. Contrary to this, the

NSO & ICF Macro, (2011) states that the highest prevalence of anaemia (over 80%) in children was found within the age group of 6 to 11 months.

Several studies however state that the highest prevalence of anaemia occurs in children less than 2 years of age but does not specify the age groups of children under 2 years of age (Aemro et al., 2013; Ewusie et al., 2014; Leite et al., 2013). Despite these disparities, there is a common understanding in all the studies that the highest prevalence of anaemia occurs during weaning period. This may be due to reduced intake of dietary sources of iron and the child's rapid rate of red blood cell synthesis (Kikafunda et al., 2009). The high prevalence of anaemia in under-24-month-old children is likely to be a combination of increased iron demand due to rapid growth, low availability of foods rich in iron, and lack of diet variation. Iron intake is also likely to improve with age as a result of a more varied diet, including the introduction of meat and other iron containing foods (Gebreegziabiher et al., 2014). Ewusie et al. (2014) assets that high prevalence of anaemia occurs at this age because the introduction of complementary foods often occurs within this period which is also a period for rapid physical development with increased blood volume and a decrease in iron storage from maternal source and the susceptibility of infants to infections and diseases, which affects their nutrition and feeding and thus decreases the ability of their body to ingest and absorb iron.

The current study has also demonstrated a link between education status of mothers and childhood anaemia. The majority of mothers (81.8%) who had the highest proportion of children with anaemia attended primary education. There was also a positive relationship between education status of mothers and knowledge of anaemia with mothers who attained secondary and college education having more knowledge than their

counterparts. This emphasizes the importance of education attainment of women to enhance their knowledge level that would facilitate their understanding of different conditions affecting under-five children and in turn knows how to prevent childhood conditions and facilitate children's well being.

Similarly, Kikafunda et al. (2009) found that maternal education was more significantly associated with children's anaemic status with mothers with no formal education and those only with primary education having more children with anaemia than mothers with secondary and tertiary education. Maternal education is also associated with dietary diversity and meal frequency of a child. In Aemro et al. (2013)'s study mothers with secondary and higher education had higher chances of meeting meal frequency of a child and were able to provide a variety of nutritious food for the child compared with mothers with low or no education level. This indicates that maternal education plays a significant role in meeting the appropriate diet for the child. Mothers with higher education status also have the available resources to meet the child's nutritional requirements thereby reducing the chances of the child suffering from nutritional deficiencies. In addition education plays a vital role in shaping cultures, opinions, customs, norms and attitudes and it also exposes an individual to wide range of new ideas and values. Education is also the only phenomenon that can loosen an individual from traditional norms and cultural practices that mimic child health and survival (Adedini et al., 2014).

The current study found no significant difference in the knowledge level of anaemia of mothers according to their age, marital status, tribe, religion, employment status and number of children. These findings are similar to study conducted by Shettigar et al. (2013) who found no significant association between knowledge scores and selected demographic variables. However, Cardoso et al. (2012) suggested that high maternal parity of more than 2 pregnancies was positively associated with anaemia in children because there is poor transfer of iron from mother to child.

Factors related to nutrition and anaemia

Knowledge of mothers on anaemia

The current study found that mothers had limited/ inadequate knowledge related to anaemia in terms of defining the condition, recognizing causes, symptoms and effects of anaemia. Kakade and Kakade (2012)'s study findings demonstrated that majority of the mothers had average knowledge regarding anaemia in underfive children.

In addition, Arlappa et al. (2011) found that only 26% of mothers of underfive children were aware of anaemia, while only 2–3% of them were aware of the causes of anaemia. Knowledge about the causes of a disease/condition helps mothers to prevent their children from having the condition and if anaemia occurs in their children it would help them recognize the problem early and report to the hospital early to prevent the complications of anaemia.

On the definition of anaemia majority of the mothers were unable to define anaemia correctly and this may be suggestive of lack of public health education on anaemia. However few mothers defined anaemia as '*reduced blood in the body*'. This is similar to Kouadio et al. (2013) findings in which mothers defined anaemia as '*blood is decreased*'. According to WHO (2013) anaemia is the condition in which number of red blood cells is *insufficient* to meet the body's physiological needs. It also refers to reduction in haemoglobin (Hb) concentration, or oxygen-binding capacity of Hb (Kouadio et al., 2013).

The majority of the mothers were able to mention at least one symptom of anaemia (paleness) and this was good because this symptom acted as a warning sign for mothers to take their children for medical attention. This is in line with the IMCI guidelines which recommends the use of palmar pallor for detection of anaemia and is lifesaving for many children and it is also useful for initiating early treatment for childhood anaemia (Aggarwal, Tripathy, Sharma & Prabhu, 2014). The majority of mothers also mentioned inadequate diet as the cause of anaemia in underfive children. However mothers were not knowledgeable about other causes of anaemia for example hook worm infestation and bilharzia therefore children could have anaemia due to the presence of these infections because preventive measures for these conditions could not be instituted due to lack of knowledge. These findings are similar to Kouadio et al. (2013)'s study findings. In the study one fifth of the mothers were unable to mention any causes of anaemia and the common symptoms that were reported to be associated with anaemia were pallor, loss of weight and weakness/ tiredness.

Perceived effects of anaemia by mothers

The current study revealed that mothers were knowledgeable about the effects of anaemia; majority of mothers mentioned death, weakness, reduced growth and frequent illness (due to reduced immunity) as effects of anaemia. The majority of mothers in the current study mentioned death as one of the effects of anaemia. Similarly in Kouadio et al. (2013)'s study death (84.4%) was the most frequently reported consequence of anaemia by mothers. Knowledge of the effects of anaemia would help mothers to prevent these effects from occurring to their children and also to seek care early before manifestation of the condition. However majority of mothers only mentioned of death as the effect/consequences of anaemia but according to Magalhaes and Clements (2011) effects of anaemia include increased risk of death, impaired cognitive function, growth and psychomotor development and impaired immune system function.

Low iron intake

In the current study children were mostly given food comprising of cereals, legumes and vegetables and the majority had a lower intake of foods from animal sources and lower intake of iron diet. According to Souganidis et al. (2012), greater consumption of grain source foods is associated with higher odds of anaemia in the child. Similarly, a study in infant feeding practices and prevalence of iron deficiency anaemia among children of 0-5 years found that animal source food for example meat, fish and liver were consumed in low quantities by children (Olufemi et al., 2013). Staple crops provide a large proportion of daily intake of energy and micronutrients among poor populations who have limited access to animal foods. However, the sources of iron from such foods are non-haem forms, which have low bioavailability (Kikafunda et al., 2009).

Food from animal sources contains heme iron which is well absorbed in the intestines than non heme iron form plant source (Pita et al., 2014). Furthermore, a child who is given cereals alone or combined with fruits and vegetables as weaning food has 3.5 times chance to be anaemic than a child who is given meat as it contains 40% of highly absorbable heme iron (Al-Qaoud et al., 2014) . According to Leal et al. (2011), the most frequent cause of anaemia in children is iron deficiency, generally associated with insufficient intake of iron or consumption of foods that inhibit iron absorption. Therefore this study suggests that anaemia in children was due to dietary/ nutritional practices and inadequate consumption of animal food. The study also suggests that the inadequate consumption of meat was due to poor socioeconomic status of mothers who reported that they had insufficient food and money to sustain the family for the whole year and mothers also lacked of knowledge about the nutrition requirements for children.

According to Hirani (2012) mothers' lack of knowledge about the nutritional requirements of children often results in unhealthy child feeding practices and causes malnutrition in children. The current study found that mothers regularly provided cereals and vegetables to their children because this was readily available and cheap to find unlike meat and dairy products which are expensive. This is supported by Osei et al. (2010) who reported that household food insecurity can negatively affect food consumption in terms of dietary variety, nutrient intake, and nutritional status of household members. Therefore anaemia in underfive children is associated with household income and food availability.

Poor methods of cooking also contributed to anaemia in children. In the current study, the majority of mothers reported that they were providing plain porridge to their child which is less nutritious compared to adding other nutritious ingredients to the porridge. Kikafunda et al. (2009) suggested that adding cow's milk or groundnuts when preparing the traditional porridge for children would make it more dense and nutritious for children. The study also noted that majority of children were fed 3 times a day which is not a recommended food frequency for children who were weaned from breast milk. According to the minimum feeding frequencies which are based upon the age specific total daily energy requirements, infants with low or no breast milk intake needs to be fed more frequently. It is recommended that non breastfed child be fed solid/semsolid foods 4 to 5 times per day from age 6 to 23 months with an additional snack being offered once or twice per day as desired (NSO & ICF Macro, 2011). Appropriate nutrition also includes feeding children a variety of foods to ensure that nutrient requirements are met (NSO & ICF Macro, 2011). According to Aemro et al. (2013), insufficient quantities and inadequate quality of complementary foods and poor child feeding practices have a detrimental effect on the health and growth of a child.

Cultural beliefs related to food and anaemia

The study found that the majority of participants mentioned that they had no cultural beliefs related to nutrition and this is good because children were allowed to eat variety of food which is proper for their growth and development. However, the study discovered that some of the cultural groups prohibited children from taking guava, okra, chidede (*Hibiscus sabdariffa*; red sorrel), denje (bush okra; *Corchorus trilocularis*) with chidulo (fire wood ash) with the belief that they cause constipation and they absorb and

dries blood. These findings are similar to Gadegbeku et al. (2013) whereby mothers believed that consumption of guava by children causes' appendicitis. Hirani (2012) also found that mothers prohibited their children from taking food considered cold or hot foods which most of them were fruits, eggs and dates as they were believed to cause infections in children. However, these cultural beliefs deprived young children from food which had rich sources of protein, iron, and minerals, and ultimately provoke the vicious cycle of malnutrition and anaemia.

According to Gadegbeku et al. (2013), food taboos influence the nutritional status of people because most of the foods which are tabooed are rich sources of protein.

Gadegbeku et al. (2013) also asserted that the vulnerable people in the society for example children are deprived of good sources of protein, carbohydrates, vitamins and minerals that are needed for growth and repair of worn out tissues.

All mothers from different cultural backgrounds involved in the current study were allowed by their culture to take children to hospital when they are sick and this is good because there were no cultural barriers to management of children with anaemia.

Religious beliefs related to food and anaemia

The study found that the majority of mothers had no religious restrictions related to food given to underfive children and this is good because children were allowed to consume different varieties of food to facilitate their growth and development. This is contrary to Baranwal et al. (2014) findings that children were restricted to eat various foods due to religious faith and this contributed to high prevalence of anaemia.

The current study also found that some of the religious affiliations deny their members from eating meat from animals which died on their own and halaam food. This is good practice because it prevents people from eating meat from infected animals that can cause infections. Similarly, Gadegbeku et al. (2013) found that halaam food for example pig and animals which have died on their own are prohibited to be eaten for religious reasons.

In the current study the majority of the participants had no religious restrictions on taking their children for medical treatment when sick. However, the study found that few mothers were restricted by their religion from allowing their children to receive blood transfusion and others were advised to take their children for prayers before visiting the hospital which could lead to delays in treatment. CCORE (2011)'s study reported similar findings, some religious groups taught their members not to use modern healthcare services and placed strict emphasis on faith healing.

Perceived treatment and management of anaemia

Traditional/local medicine as treatment for anaemia

The study found that the majority of mothers reported that traditional medicine can prevent or heal anaemia in children. However fewer participants mentioned giving their children traditional medicine for example avocado pear leaves, chidede (*Hibiscus sabdariffa*; red sorrel), mlombwa (African Taek) and herbal medicine (unknown) mixed with coke. According to Kone, Koffi, Bomisso and Bi (2012) medicinal plants can be traditionally used for the treatment of anaemia. On contrary to this finding, it was noted that children who were given traditional medicine did not improve according to report

from mothers and some had their condition worsened and children were delayed from receiving proper treatment at the hospital. Furthermore, the traditional medicine which mothers gave their children had unknown ingredients and dosages and this could lead to complications in children.

Analgesics and antipyretics as treatment of anaemia

The study found that the majority of mothers believed that local vendor medicine could help to prevent or heal anaemia. Majority of mothers mentioned buying Paracetamol, Cafemol and Brufen for the home treatment of fever for their children which they thought would also treat anaemia apart from fever. This is contrary to findings of Sumbele et al. (2013) in which mothers preferred giving their children iron tablet and herbal remedies as home treatment for anaemia. However, this study found that mothers were giving children over the counter medications for fever and its related illnesses for example malaria and other bacterial infections which if not properly treated could cause anaemia in children. Furthermore, management of fever at home could delay the treatment of these illnesses and lead to other complications for example severe anaemia and death.

Barriers related to health care services for children with anaemia

The study found that the barriers to health care that were reported by mothers were long walking distances to the health facility, non availability of medication, lack of triaging of patients, inadequate check-up, and late reporting of health workers for outreach activities.

Long distance to the health facilities had been identified in several studies (Halwindi et al., 2013; Adedini et al., 2014; Khalid et al., 2014) as an important barrier to health care for underfive children especially in rural areas. According to Halwindi et al. (2013), children who live closer to the health facility are more likely to utilize the health services than children who live far away. Long distance to health care facilities also causes delays in the decision to seek care (Adedini et al., 2014). The current study discovered that majority of the barriers identified in this study involved the health service provision thus the health workers and the health care system. Halwindi et al. (2013) suggested that mobilizing demand for child survival interventions may be ineffective if the actual or perceived quality of general health care services is low. The current study found that mothers reported that there are inadequate checkups for children which were also identified as a barrier in the study conducted by Bar-Zeev et al. (2013). The authors found that clinicians were not performing anaemia checks or follow-up treatment for underfive children. The study also found that there was lack of medicine to treat children at the government health facilities and this had implications for child survival. Furthermore, Halwindi et al. (2013) also found that there was poor quality of service at health centres and non availability of medicines for the underfive children.

Cues to action for anaemia prevention

Sources of health information related to anaemia

The study found that the majority of the participants heard about nutrition information however fewer than half never heard about nutrition for underfive children. Similarly, Shihundu (2012) found that the majority of mothers had some form of nutrition education and 46% of mothers had low nutrition education.

On the contrary, Arlappa et al., (2011) found that only 1% of the mothers of underfive children received health and nutrition education on anaemia. The study also noted that the nutrition messages which mothers received were related to exclusive breastfeeding, food preparation and types of food to give their children. This is contrary to Shihundu (2012)'s findings which indicated that basic concepts of nutrition education (food groups, balanced diets and methods of cooking) lacked among mothers. Despite the majority of mothers having knowledge related to nutrition for the child the study noted that there was poor feeding practices among the underfive children and this could be due to poor socioeconomic status which resulted into unbalanced and inadequate diet for children. The low education level of mothers could also contribute to the poor diet for children as suggested by Shihundu (2012) that the level of education among mothers influences the feeding practices used with the higher education level attained by the mothers contributing to better acquisition and use of nutrition education.

The current study also found that the majority of mothers heard about nutrition related information from the underfive clinic whilst one of the participant heard from health surveillance assistants (HSAs) who visited her in the village. Several studies have also cited health workers as the source for information for mothers on nutrition and anaemia in underfive children (Aemro et al., 2013; Berihu et al., 2013; Kouadio et al., 2013; Kwon et al., 2013; Shettigar et al., 2013). On the contrary, Shettigar et al. (2013) states that the mass media was the most common source of information which mothers obtained information about nutrition, nutritional problems and its prevention.

The current study found that the majority of the participants never heard about anaemia. This is contrary to Shettigar et al. (2013) findings which states that only 10% of mothers never heard about nutritional problems affecting underfive children which included anaemia. Few participants who had information related to anaemia received it from the under five clinic, from friends and relatives. The anaemia message the participants heard was on the causes, symptoms and treatment of anaemia. However, the study noted that some of the messages which mothers received from friends and relatives were wrong. Wrong messages which mothers received could affect mothers perception of the seriousness of the child's condition and the choice of treatment mothers decided to seek for their children.

Despite receiving nutritional and anaemia related information, mothers demonstrated lack of knowledge on child nutrition and on anaemia. This shows that there are limited sources of information for mothers; the majority of mothers were receiving information during health talks at the underfive clinics which was group focused rather than individual focused.

To sum it up, there was missed opportunity for health education on nutrition, anaemia and other relevant issues affecting underfive children for mothers who did not attend or came late during the underfive clinics.

Strength of the study

The study used both questionnaire and interview guide in order to collect rich information from mothers of underfive children.

Limitations for the study

- The study was conducted in one health facility which would limit generalization of findings to the whole population of children in Malawi.
- The study also used non probability consecutive sampling which could also limit generalization of findings.
- Participants for qualitative study were selected through purposive sampling and it was based on how they responded to the questionnaire. However, vital information may have been missed from mothers who did not meet the criterion to participate in the qualitative part of the study.

Recommendations

1. The study found that only 59.1% had average knowledge related to causes and symptoms of anaemia therefore;
- Mothers should also be educated on early recognition of anaemia and early reporting to hospital to prevent complications though regular health talks.

- The existing communication channels for example mass media, child health day's campaigns should target the community in disseminating health related information, education and communication (IEC) on anaemia prevention and promotion of nutrition for underfive children.
2. The study also found that the majority of mothers gave their children food which had low iron content, therefore;
- There is need for mothers to be educated on iron containing foods for underfive children and its importance to prevent anaemia.
 - Mothers should also be taught by community workers (health surveillance assistants & agricultural extension workers) on different ways to obtain iron rich food for their children for example having a small garden and planting fruit trees at home and animal farming for example rearing chicken which will provide food rich in iron content
3. The study found that some mothers failed to take their children to hospital due to distance and money therefore there is need to advocate for partnership with private or mission health facilities (service level agreement) for hard to reach areas to increase access to child health care services.
4. The findings also revealed that there is poor quality of care provided by health workers in the management of underfive children with anaemia, therefore there is need for on job training and continuous professional development lessons for nurses and clinicians related to nutrition counselling and anaemia checkups and follow up.

Further research

- The study found that some mothers gave their children herbal medication in order to treat anaemia therefore there is need to conduct research on the herbs used for treatment of anaemia to verify if they can be used as alternative treatment in the management of anaemia.

Conclusion

The purpose of this study was to explore knowledge, beliefs and practices among mothers whose underfive children were admitted with anaemia at Kamuzu Central Hospital. The findings for the study showed that mothers have limited knowledge related to meaning/definition of anaemia, causes and symptoms of anaemia which can affect health care seeking behaviours and lack of preventive measures for anaemia in underfive children. However, mothers who attained college level had more knowledge of anaemia compared to mothers with no formal education and this emphasizes importance of maternal education on child health status. The study also found that the majority of mothers have no religious or cultural beliefs related to anaemia in underfive children which is good because children were allowed to eat variety of food and they were not restricted to receive anaemia treatment at the hospital. However, the study noted that few mothers gave their children herbal concoctions for example chidede and avocado pear leaves in order to treat anaemia and this also led to delays in taking children to hospital. The study also found that the majority of children had poor diet due to poor feeding practices and poor socioeconomic status which contributed to anaemia.

Barriers that have been identified to affect child health care services for children with anaemia include; long walking distances to the health facility, lack of medication, no triaging of patients, inadequate check-up, and late reporting of health workers for outreach activities. There is also inadequate health related messages on anaemia. There is need to educate mothers on nutrition and early recognition of anaemia in order to prevent complications of anaemia. Health workers should also be updated regularly on nutrition counselling and anaemia checkups and follow up. There is also need to conduct research on the herbs used for treatment of anaemia to verify if they can be used as alternative treatment in the management of anaemia.

References

- Abubakar, A., Van Baar, A., Fischer, R., Bomu, G., Gona, J & Newton, C. (2013). Socio- cultural determinants of health-seeking behaviour on the Kenyan coast: A qualitative study. *PLoS one journal*; 8(11), 1-8.
- Adedini, S., Odimegwu, C., Bamiwuye, O., Fadeyibi, O & De Wet, N. (2014). Barriers to accessing health care in Nigeria: implications for child survival. *Global Health Action*, 14 (7). Retrieved from
<http://www.globalhealthaction.net/index.php/gha/article/view/23499>
- Adhikari, R. (2010). *Food utilization practices, beliefs and taboos in Nepal an overview*. Retrieved from http://pdf.usaid.gov/pdf_docs/pnaeb773.pdf
- Aemro, M., Mesele, M., Birhanu, Z & Atenafu, A. (2013). Dietary diversity and meal frequency practices among infant and young children aged 6–23 months in Ethiopia: a secondary analysis of Ethiopian demographic and health survey 2011. *Journal of Nutrition and Metabolism*, Article ID 782931, retrieved from
<http://www.hindawi.com/journals/jnme/2013/782931/>
- Aggarwal, A., Tripathy, J., Sharma, D & Prabhu, A. (2014). Validity of palmar pallor for diagnosis of anaemia among children aged 6–59 months in North India. *Hindawi Journal*. Retrieved from <http://www.hindawi.com/journals/anemia/2014/543860/>
- Alhojailan, M. (2012). *Thematic analysis: a critical review of its process and evaluation*. Retrieved from <http://goo.gl/NF4Fpm>
- Al-Qaoud, N., Al-Shami, E & Prakash, P. (2014). Anaemia and associated factors among Kuwaiti preschool children and their mothers. *Alexandria Journal of Medicine*. Retrieved from <http://dx.doi.org/10.1016/j.ajme.2014.06.006>

Arlappa, N., Laxmaiah, A., Balakrishna, N., Harikumar, R., Kodavanti, M., Reddy, G....& Brahmam, G. (2011). Micronutrient deficiency disorders among the rural children of West Bengal, India. *Annals of Human Biology*, 38(3): 281–289.

Baranwal, A., Baranwal, A & Roy, N. (2014). Association of household environment and prevalence of anaemia among children under-5 in India. *Frontiers in Public Health journal*, 2 (196).

Bar-Zeev, S., Kruske, S, Barclay, L, Bar-Zeev, N, & Kildea, S. (2013). Adherence to management guidelines for growth faltering and anaemia in remote dwelling Australian aboriginal infants and barriers to health service delivery. *BMC Health Services Research*, 13 (250) <http://www.biomedcentral.com/1472-6963/13/250>

Berihu, A., Abera, G., Berhe, H & Kidanu, K. (2013). Mother's knowledge on nutritional requirement of infant and young child feeding in Mekelle, Ethiopia, cross sectional study. *Global Journal of Medical research Interdisciplinary*, 13 (6), 13-24.

Bilenko, N., Yehiel, M & Gazala, E. (2007) .The association between anaemia in infants, and maternal knowledge and adherence to iron supplementation in southern Israel. *Israel Medical Association Journal*, 9,521-524.

Boele van Hensbroek, M., Calis, J. C. J., Phiri, K. S., Vet, R., Munthali, F., Kraaijnhagen, R., ... Molyneux, M. E. (2010). Pathophysiological mechanisms of severe anaemia in Malawian children. *PloS One*, 5(9), e12589.
<http://doi.org/10.1371/journal.pone.0012589>

Borbor, F., Kyereme, A., Yendaw, E & Opong, A. (2014). A study of the determinants of anaemia among under-five children in Ghana. *International Journal of Development Research* 4, (4), 858-867.

Burns, N & Grove, S. (2009). *The practice of nursing research: appraisal, synthesis and generation of evidence*. (6th ed.). St Louis: Saunders Elsevier.

Cardoso, M.A., Scopel, K., Muniz, P.T, Villamor, E & Ferreira, M.U. (2012. Underlying factors associated with anaemia in Amazonian children: a population based cross sectional study. *PLoS one*, 7(5). Retrieved from
<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0036341>

CCORE. (2011). Apostolic religion, health and utilization of maternal and child health services in Zimbabwe. Retrieved from
http://www.unicef.org/zimbabwe/ZIM_resources_apastolicreligion.pdf

Current Nursing. (2012). Health Belief Model. Retrieved November 14, 2015, from
http://currentnursing.com/nursing_theory/health_belief_model.html

Ewusie, J., Ahiadeke, C., Beyene, J & Hamid, J. (2014). Prevalence of anaemia among under-5 children in the Ghanaian population: estimates from the Ghana demographic and health survey. *BMC Public Health*, 14:626. Retrieved from
<http://www.biomedcentral.com/1471-2458/14/626>

Finlay, J., Ozaltin, E & Canning, D. (2011). The association of maternal age with infant mortality, child anthropometric failure, diarrhoea and anaemia for first births: evidence from 55 low- and middle-income countries. *Biomedical Journal Open*; doi: 10.1136/. Retrieved from
<http://bmjopen.bmj.com/content/1/2/e000226.full.pdf+htm>

Gadegbeku, C., Wayo, R., Badu, G., Nukpe, E & Okai, A. (2013). Food taboos among residents at Ashongman - Accra, Ghana. *Food science and quality management*, 2013(15), 21-29.

Gebreegziabiher, G., Etana, B & Niggusie, D. (2014). *Determinants of anaemia among children aged 6–59 months living in Kilte Awulaelo Woreda, Northern Ethiopia*. Retrieved from <http://www.hindawi.com/journals/anemia/2014/245870/>

Glanz, K., Rimer, B.K. & Lewis, F.M. (2002). *Health Behavior and Health Education. Theory, Research and Practice*. San Francisco: Wiley & Sons.

Habte, D., Asrat, K., Magafu, M., Ali, I., Benti, T., Abtew, W., ...Shiferaw, S. (2013). Maternal risk factors for childhood anaemia in Ethiopia. *African Journal of Reproductive Health*; 17[3]: 110-118).

Halwindi, H., Sizya, S., Magnussen, P & Olsen, A. (2013). Factors perceived by caretakers as barriers to health care for under-five children in Mazabuka district, Zambia. *Hindawi Publishing Corporation*, article ID 905836. Retrieved from <http://www.hindawi.com/journals/isrn/2013/905836/>

Hayden, J. (2009). *Introduction to health behaviour theory*. Sudbury, MA: Jones & Bartlett Publishers

Hirani, S. (2012). Malnutrition in young Pakistani children. *Journal of Ayub Medical College Abbottabad*, 24(2), 150-153.

Holloway, I & Wheeler, S. (2002). *Qualitative research in nursing*. (2nd ed.). Oxford: Blackwell publishing company.

Janz NK, Becker MH. (1984). The health belief model a decade later. *Health education quarterly*, 11:1-47.

Kakade, N & Kakade, S (2014). A study to assess knowledge of mothers of fewer than five children regarding nutritional anaemia from Karad urban area. *International Journal of Science and Research*, 3(10), 1007-1009.

- Keikhaei, B., Zandian, K., Ghasemi, A & Tabib, R. (2007). Iron deficiency anaemia among children in southwest Iran. *Food and nutrition bulletin*, 28(4), 406-411
- Khalid, M., Kumari, R., Mohan, U., Manar, M & Singh, V. (2014). Morbidity profile of preschool children from below poverty line families of Lucknow district, North India. *International Journal of Advanced Research*, 2(11), 627-634.
- Kikafunda, J.K., Lukwago, F.B & Turyashemererwa, F. (2009). Anaemia and associated factors among under-fives and their mothers in Bushenyi district, Western Uganda. *Public Health Nutrition*, 12(12), 2302 – 2308.
- Kone, W., Koffi, A., Bomisso & Bi, E. (2012). Ethnomedical study and iron content of some medicinal herbs used in traditional medicine in Cote d'Ivoire for the treatment of anaemia. *Africa Journal of Traditional Complementary Alternative Medicine*, 9(1):81-87.
- Kothari, C.R. (2004). Research methodology: Methods and techniques. (2nd ed.). New Delhi: New age international publishers.
- Kouadio, M., Righetti, A., Abé, N., Wegmüller, R., Weiss, M., N'Goran, E ...& Utzinger, J. (2013). Local concepts of anaemia-related illnesses and public health implications in the Taabo health demographic surveillance system, Côte d'Ivoire. *Biomedical central Hematology*. Retrieved from <http://www.biomedcentral.com/2052-1839/13/5>
- Kwon, H., Ramasamy, R & Morgan, A. (2013). “How often? how much? Where from?” Knowledge, attitudes, and practices of mothers and health workers to iron supplementation program for children under five in rural Tamil Nadu, South India. *Asia-Pacific Journal of Public Health*. Retrieved from <http://aph.sagepub.com/content/early/2013/12/17/1010539513514435.full.pdf+html>

- Leal, L.P., Filho, M.B., Cabral de Lira, I.P., Figueiroa, J.N & Osório, M.M. (2011). Prevalence of anaemia and associated factors in children aged 6-59 months in Pernambuco, North-eastern Brazil. *Review Saúde Pública*, 45(3), 1-9.
- Leite, M., Cardoso, A., Coimbra, C., Welch, J., Gugelmin, S., Lira, P...& Escobar, R. (2013). Prevalence of anaemia and associated factors among indigenous children in Brazil: results from the First National Survey of Indigenous People's Health and Nutrition. *Nutrition Journal*, 12:69.
<http://www.nutritionj.com/content/12/1/69>
- Lemeshow, S., Hosmer, D., Klar, J & Lwanga, S. (1990). Adequacy of sample size in health studies. New York: John Wiley & Sons.
- Magalhaes, R.J. & Clements, A.C. (2011). Spatial heterogeneity of haemoglobin concentration in preschool-age children in Sub-Saharan Africa. *World Health Organization Bulletin*. 89:459-468.
- Malawi National Statistical Office & ICF Macro. (2011). 2010 *Malawi Demographic and Health Survey 2010*. Calverton, Maryland, USA: NSO and ICF Macro.
- Ministry of Agriculture. (2009). *A report for the national micronutrient survey*. Lilongwe: Department of Nutrition.
- Mwanziva, C., Daou, M., Mkali, H., Masokoto, A., Mbugi, E., Shekalaghe, S., Mosha, F & Chilongola, J. (2010). High prevalence of anaemia in pastoral communities in Kilimanjaro region: malnutrition is a primary cause among Maasai ethnic group. *Annals of biological research*, 1 (2):221-229.
- Nnakwe, N. (2011). *Community nutrition: Planning health promotion and disease prevention*. Burlington, Massachusetts: Jones & Bartlett Learning.

Olufemi, S.S., Gbadamosi O.F, Akinrinmade R & Oladapo A.A. (2013). Infant feeding practices and prevalence of iron deficiency anaemia among children of 0-5 years in Ondo State, Nigeria. *Journal of Pharmacy and Biological Sciences*, 5(3), 34-39.

Osei, A., Pandey, P., Spiro, D., Nielson, J., Shrestha, R., Talukder, Z., ...Haselow, N. (2010). Household food insecurity and nutritional status of children aged 6 to 23 months in Kailali district of Nepal. *Food and Nutrition Bulletin*, 31 (4), 483-494.

Peiris, T & Wijesinghe, D. (2010). Nutritional Status of under 5 year-old children and its relationship with maternal nutrition knowledge in Weeraketiya DS division of Sri Lanka. *Tropical agricultural research*, 21(4): 330 – 339.

Pita, G., Jiménez, S., Basabe, B., García, R., Macías, C., Selva, L., ...Herrera, R. (2014). Anaemia in children under five years old in Eastern Cuba, 2005–2011. (2014) *MEDICC Review*, 16(1).

<http://www.medicc.org/mediccreview/index.php?issue=27&id=340&a=va>

Polit, D. & Beck, C. (2010). *Essentials of nursing research: appraising evidence for nursing practice*. (7th ed.). Philadelphia: Lippincott Williams & Wilkins.

Research Team of Minzu University of China. (2010). *Study on traditional beliefs and practices regarding maternal and child health in Yunnan, Guizhou, Qinghai and Tibet* (CDPF Publication No. 8). Beijing: Minzu University of China. Retrieved from
http://www.unfpa.org/sites/default/files/pubpdf/Minzu_report_EN_1_Sep_2011%5B1%5D.pdf

Robson, C. (2011). *Real world research: A resource for users of social research methods in applied settings*. (3rd ed.). West Sussex: Wiley & sons.

Santos, F., Gonzalez, E., Albuquerque, E., Arruda, I., Diniz, A., Figueroa, J & Pereira, A. (2011). *Prevalence of anaemia in under five-year-old children in a children's hospital in Recife, Brazil*. Retrieved from
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3520632/>

Schmidt, N.A & Brown, J.M. (2012). *Evidence based practice for nurses: Appraisal and application of research*. (2nd ed.). Ontario: Jones & Bartlett Learning

Shettigar D, Ansila M, George M, Chacko J, Thomas RJ & Shukoor S. (2013). Assessment of knowledge of mothers of underfive children on nutritional problems: A rural community based study. *National Journal of Community Medicine*, 4(1): 141-144.

Shihundu, A. (2012). The impact of maternal nutrition education on nutritional status of children under five years old in Buttered Division, Kenya. Retrieved from
<http://ir-library.ku.ac.ke/handle/123456789/2368?show=full>

Souganidis, E., Sun, K., de Pee, S., Kraemer, K., Rah, J., Pfanner, R. M & Semba, R. (2012). Relationship of maternal knowledge of anaemia with maternal and child anaemia and health-related behaviours targeted at anaemia among families in Indonesia. *Maternal Child Health Journal*, 16, 1913–1925.

Sumbele, I., Samje, M & Akenji, T. (2013). A longitudinal study on anaemia in children with plasmodium falciparum infection in the Mount Cameroon region: prevalence, risk factors and perceptions by caregivers. *Biomedical central infectious diseases* 13:123. Retrieved from
<http://www.biomedcentral.com/content/pdf/1471-2334-13-123.pdf>

UNICEF. (2009). *Investing in the future: a united call to action on vitamin and mineral deficiencies: global report 2009*. New York: UNICEF.

WHO. 2008. *Worldwide prevalence of anaemia 1993–2005* Geneva: WHO

WHO. (2011). *Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and mineral nutrition information system*. Retrieved from <http://www.who.int/vmnis/indicators/haemoglobin.pdf>

Yang, W., Li, X., Zhang, S., Liu, L., Wang, X & Li, W. (2012). Anaemia, malnutrition and their correlations with sociodemographic characteristics and feeding practices among infants aged 0-18 months in rural areas of Shaanxi province in north-western China: a cross sectional study. *Biomedical medical central public health*, 12, 1127, 1-7. Retrieved from <http://www.biomedcentral.com/1471-2458/12/1127>

Appendices

Appendix A: Participant's information sheet

A research study on knowledge, beliefs and practices of mothers related to anaemia in underfive children at Kamuzu Central Hospital

***Please read the information below and sign the form next page if you are taking part in
this study***

My name is Felistas Macheso, a student at Kamuzu college of Nursing (University of Malawi), pursuing Master Degree course in Child health Nursing. As part of the requirements, I am conducting a study on knowledge, beliefs and practices of mothers of underfive children with anaemia at Kamuzu central hospital. The study will be conducted at Kamuzu central hospital paediatric ward. You are therefore being invited to take part in a research study. The study has been approved by the Research and Ethics Committees of Kamuzu College of Nursing and College of Medicine. Before you decide to participate in the study, it is important to understand why the research is being conducted and what will involve. Please ask if there is anything that is not clear or if you would like more information. Participation is voluntary.

What is the purpose of the study?

The purpose of the study is to assess mothers knowledge, beliefs and practices regarding anaemia in underfive children. The study findings may guide health planners on planning interventions towards prevention of anaemia in underfive children thereby reducing child morbidity and mortality.

Do I have to take part?

Participation in this study is voluntary. You are free to take part or not or to withdraw at any time you feel like without giving reasons. Your refusal to take part in the study will not affect the quality of health care your child is going to receive in any way. If you agree to take part, you will be asked to sign a consent form. Information about you will be confidential and no one will identify who answered the questions. No names will be written on the questionnaires and interview guides, instead, code numbers will be used. The questionnaires and interview responses will be destroyed at the end of the study.

What do I expect as a participant?

You will be asked some questions related to anaemia in children, causes and symptoms of anaemia, your personal, cultural and religious beliefs and practices related to anaemia in children and your responses will be documented on the interview sheet and recorded on the tape recorder to avoid missing information. You will be required to answer the questions truthfully and it will take approximately less than 1 hour.

What are the possible risks for taking part?

There are no known risks associated with this study.

What are the possible benefits?

There are no immediate benefits to you. Findings of the study may help to improve information, education and communication related to anaemia and may also strengthen/improve interventions towards anaemia prevention in children

If something goes wrong what will happen?

Complaints concerning how you have been treated during the course of the study can be forwarded to Kamuzu College of Nursing number on 0111873623.

Contacts for further information

If you need further information or you are worried about any aspect of the study, please contact Felistas Macheso, Cell number 0999 317 298 and Dr.Hami, cell number 0888514 485

OR

The Secretariat, College of Medicine Research Ethics Committee

Private Bag 360, Blantyre, Malawi.

Telephone number 0111 871911

Appendix B: Consent form

Make sure you have read the above information before signing below if you are taking part in this study.

1. I have read (or have had another person read to me) the attached information sheet for this study and have understood the purpose of the study and the problems involved. Yes/No
2. I agree to voluntarily participate in the study and provide answers to the best of my knowledge. I understand that I am free to withdraw from the study any time and this will not influence anything. Yes/No
3. I know that I am not going to have any injury or harm during the research process. The information that I will give to the researcher should not be used against me in future. Yes/No
4. I understand that the information I give will be kept confidentially and will only be accessed by the researcher or those people directly concerned with this study. Yes/No
5. I understand that I will not benefit financially. Yes/No
6. I know how to contact the researcher if I need to. Yes/No

I voluntarily agree to take part. Yes/No

Participant's name

Signature/Thumb print

Date

.....

Witness name Signature Date

.....

Name of interviewer Signature Date

.....

THANK YOU FOR TAKING PART IN THIS STUDY

Appendix C: Kalata Yofotokoza Zakafukufuku

Kafukufufu okhudza zomwe amayi amadziwa, zikhulupiliro zawo komanso zomwe amachita zokhudza ana ochepera zaka zisanu omwe ali ndi vuto la kuchepa kwa magazi

Dzina langa ndine Felistas Macheso, ophunzira wa pa sukulu ya ukachenjede ya zaunamwino ndi uzamba ya Kamuzu College of Nursing. Ndikupanga maphunziro a ukachenjede okhudza za umoyo wa ana. Ngati mbali imodzi ya maphunziro anga, ndimayenera kupanga kafukufuku. Kafukufuku amene ndikupanga ndiwofuna kudziwa maganizo a azimayi okhudza zimene amadziwa, zikhulupiliro zawo komanso zomwe amachita zokhudzana ndi ana ochepera zaka zisanu amene ali ndi vuto la kuchepa kwa magazi pa chipatala chachikulu cha Kamuzu. Kafukufukuyu adzachitikila ku chipinda cha ana odwala. Muli kupephedwa kutenga nawo mbali mu kafukufukuyu. Kafukufukuyu wavomelezedwa ndi akomiti yoona za research ya Kamuzu College of Nursing komanso College ya madotolo. Mukuyenera kumvetsetsa cholinga cha kafukufukuyu musanapange chisankho cholowa nawo. Ngati chilipo china chomwe simunamvetse chokhudzana ndi kafukufuku ameneyu, mutha kufunsa. Kutenga nawo mbali pa kafukufuku ameneyu ndi kosaumiriza ayi.

Kodi cholinga cha kafukufukuyu nchiani?

Cholina chakafukufukuyu ndikufuna kudziwa maganizo a azimayi okhudza zimene amadziwa, zikhulupiliro zawo komanso zomwe amachita zokhudzana ndi ana ochepera zaka zisanu amene ali ndi vuto la kuchepa kwa magazi pa chipatala chachikulu cha Kamuzu.

Pali chikhulupiliro choti zotsatira za kafukufukuyu zidzathandiza akulu a zaumoyo kupeza njira zopewera vuto la kuchepa magazi kwa ana choncho zitha kupititsa thanzi la ana patsogolo ndikuchepetsa imfa za ana zimene zimabwera chifukwa cha vuto la kuchepa kwa magazi.

Kodi ndingatenge nawo mbali pakafukufuku uyu?

Ndikufuna kwanu kusankha kutenga nawo mbali mukafukufuyu kapena ayi. Muli ndi ufulu kufuna kusiya nthawi imene mukufuna ndipo izi sizizaletsa mwana wanu kulandira thandizo.

Mayankho anu azasungidwa mwachinsinsi ndipo dzina lanu silizalembewa pena paliponse chifukwa tizagwiritsa ntchito ma nambala. Mapepala onse azaotchedwa pomaliza pakafukufuku ameneyu.

Kodi chidzachitike ndi chiyani ngati nditenge nawo mbali?

Mukavomereza kutenga nawo mbali mukafukufuyu mudzafunsidwa mafunso okhuzana ndi vuto lakuchepa magazi kwa ana ochepera zaka zisanu, zinthu zomwe zimabweretsa/zimapangitsa vuto la kuchepa kwa magazi komanso zizindikiro za vutoli, zikhulupiliro zanu ndi zomwe mumachita zokhudza vuto la ku kuchepa magazi kwa ana. Mukupemphedwa kuyankha mafunsowa malinga ndi momwe mukudziwira ndi mowona mtima ndipo mafunsowa adzatenga nthawi pafupifupi ola limodzi.

Kodi zovuta zimene zingaoneke potenga nawo mbali ndi ziti?

Palibe zovuta zodziwika mukatenga nawo mbali mukafukufuyu.

Kodi phindu lake nchiani?

Sikuti pali phindu lina lapadera mukatenga nawo mbali. Pali chikhulupiliro choti zotsatira zakafukufukuyu zidzathandiza kupeza njira zopewera ndi zofalitsira mauthenga okhudza vuto la kuchepa magazi kwa ana.

Patapezeka zovuta zokhuzana ndi kafukufukuyu chingachitike ndi chiyani?

Ngati pangapezeke zovuta kapena nkhawa ina ili yonse yokhuzana ndi kafukufukuyu, khalani omasuka popereka madandaulo ku Kamuzu College of Nursing number on 0111873623.

Kuti mumve zambiri?

Ngati mufuna kumva zambiri imbilani Felistas Macheso, Cell number 0999 317 298 and Dr.Hami, cell number 0888514 485

Kapena

The Secretariat, College of Medicine Research Ethics Committee

Private Bag 360, Blantyre, Malawi.

Nambala ya lamya 0111 871911

Appendix D: Kalata Ya Chivomerezo Yolowela Mu Kafukufuku

Onetsetsani kuti mwawerenga ndi kumvetsetsa zakafukufuku ameneyu musanasayinire

1. Ndawerenga (kapena wina wandiwerengera) kalata yolongosola za kafukufuku ali pamwambayu ndipo ndamvetsa cholina cha kafukufukuyu ndizovuta zake.
Inde/Ayi
2. Ndavomereza kutengapo mbali pa kafukufukuyu mosaumirizidwa ndi kufunsidwa mafunso amukafukufukuyu. Ndamvetsa kuti ndili ndi ufulu kusiya nthawi ina ili yonse. Inde/Ayi
3. Ndikuziwa kuti sindiyenera kuvulala kapena kupeza vuto munthawi ya kafukufukuyi, ndipo zomwe ndingayankhule kapena kupereka mukafukufukuyu sizidzanditembukira. Inde/Ayi
4. Ndikumvetsa kuti zonse zomwe zamukafukufukuyu zidzasungidwa mwachinsinsi ndikugwiritsidwa ntchito ndiopanga kafukufukuyi kapena okhuzidwa ndi kafukufukuyi. Inde/Ayi
5. Ndamvetsetsa kuti palibepo phindu la ndalama potenga nawo mbali mukafukufuku ameneyu. Inde/Ayi
6. Ndikudziwa mmene ndikapezere opanga kafukufukuyu ngati ndikofunika kutero
Inde/Ayi

Ine ndikuvomeleza kutenga nawo mbali mukafukufukuyu. Inde/Ayi

Dzina la otenga mbali

Chizindikiro

Tsiku

.....

Dzina la mboni

Chitsindikizo/Saini

Tsiku

.....

Dzina la opanga kafukufuku

Chitsindikizo

Tsiku

.....

ZIKOMO POTENGA NAWO MBALI PA KAFUKUFUKU AMENEYU

Appendix E: Questionnaire

Knowledge, beliefs and practices of mothers related to anaemia in underfive children at Kamuzu Central Hospital.

Participant's ID number:

Interviewer:

Date of interview:

Questionnaire number:

Section A- Modifying factors (demographic data)		
A1	How old are you?	15-19yrs.....1 20-24yrs.....2 25-29yrs.....3 30-34.....4 35-39yrs.....5 Over 40.....6
A2	What is your marital status?	Married.....1 Single.....2 Divorced.....3 Widow.....4
A3	What is your denomination?	Roman catholic.....1 C.C.A.P.....2 Islam.....3 Jehovah's witness.....4 Seventh day Adventist.....5 Church of Christ.....6

		Assemblies of God.....7 Other Pentecostal churches.....8 Other (specify).....9
A4	What is your education level	Primary1 Secondary.....2 College.....3 None.....4
A5	What kind of work do you do?	Employed.....1 Self employed.....2 None.....3 Other4
A6	What kind of work does your husband do?	Employed.....1 Self employed.....2 None.....3 Other4
A7	How many children do you have?	Not more than 2.....1 3 to 4.....2 5 children.....3 More than 5.....4
B1	What is the age of the child?	Less than 6 months.....1 7months to 12 months.....2

		13 to 24 months.....3 25 months to 60 months.....4
B2	Of the child that you have, what position (chronological number in the family) is this child?	1.....1 2.....2 3.....3 4.....4 Other5
B3	Is this the first admission of the child with this problem of anaemia?	Yes.....1 No.....2
B4	If No, how many times has the child been admitted with anaemia?	Once.....1 Twice.....2 Three times.....3 More than 3 times.....4
B5	When was the last time that the child was admitted with anaemia	3 months ago.....1 6 months ago.....2 12 months ago.....3 Cannot remember.....4 Other.....5

Section C: Knowledge related questions

C1. Mention the causes of anaemia in children?

1	Poor/ unbalanced diet.....1
2	Blood loss.....2
3	Malaria.....3
4	Bilharzia.....4
5	Hook worms.....5
6	Chronic diseases for example AIDS, Cancer.....6
7	Other.....7

C2. Mention the symptoms of anaemia?

1	Pale skin colour.....1
2	Irritability.....2
3	Weakness.....3
4	Heart palpitations.....4
5	Headaches5
6	Dizziness.....6
7	Other.....7

Appendix F: Kalata Ya Mafunso

**Zimene amayi amadziwa, zikhulupiliro zawo komanso zomwe amachita
zokhudzana ndi ana ochepera zaka zisanu amene ali ndi vuto la kuchepa kwa
magazi pa chipatala cha Kamuzu central.**

Chizindikiro cha otenga mbali:

Ofunsa mafunso:

Tsiku la mafunso:

Nambala ya kalata ya mafunso:

Gawo loyamba: Mbiri ya mayi		
A 1	Kodi muli ndi zaka zingati?	15 mpaka 19.....1 20 mpaka 24.....2 25 mpaka 29.....3 30 mpaka 34.....4 35 mpaka 39.....5 Kupitilira zaka 40.....6
A 2	Kodi muli pa banja?	Eya.....1 Ayi.....2 Linatha.....3 Ndine mkazi wamasiye.....4
A 3	Kodi ndinu a chipembedzo chanji?	Katolika.....1 CCAP.....2 Chisilamu.....3 Mboni za Yehova.....4 Seventh day5

		Mpingo wa khristu.....6 Assemblies.....7 Ma pentecostal chalichi ena.....8 Ma chalichi ena.....9
A 4	Kodi sukulu munalekezera pati?	Ku pulayimale.....1 Ku sekondale.....2 Ku college.....3 Sindinapiteko kusukulu.....4
A 5	Kodi muli pa ntchito?	Eya.....1 Ndimapanga bizinesi.....2 Ayi.....3 Zina.....4
A 6	Kodi amuna anu amagwira ntchito?	Eya.....1 Ndimapanga bizinesi.....2 Ayi.....3 Zina.....4
A 7	Kodi muli ndi ana angati?	Osapitilira awiri.....1 Atatu kapena anayi.....2 Asanu.....3 Oposera asanu.....4

Gawo lachiwiri: Mbiri ya mwana

B 1	Kodi mwana wanu ali ndi zaka zingati?	Ochepera miyezi isanu ndi umodzi.....1 Wapakati pa miyezi isanu ndi iwiri mpaka chaka chimodzi.....2 Oposera chaka chimodzi mpaka zaka ziwiri..... ...3 Oposera zaka ziwiri mpaka zaka zisanu..... ..4
B 2	Pa ana amene muli nawo, mwanayu ndi wachingati?	Woyamba.....1 Wachiwiri.....2 Wachitatu.....3 Wachinayi.....4 Yankho lina.....5
B 3	Kodi aka ndi koyamba mwana wanu kugonekedwapo mchipatala ndi vuto la kuchepa kwa magazi?	Eya.....1 Ayi.....2

B 4	Ngati anagonekedwapo mchipatala, anagonekedwa kangati ndi vuto lokhudza kuchepa kwa magazi?	Kamodzi.....1 Kawiri.....2 Katatu.....3 Koposera katatu.....4
B 5	Kodi padutsa miyezi ingati pamene mwana wanu anagonekedwako mchipatala ndi vuto lomweli lakuchepa kwa magazi?	Miyezi itatu.....1 Miyezi isanu ndi umodzi.....2 Chaka chimodzi.....3 Sindingathe kukumbukira.....4 Zina.....5

Gawo lachitatu: Mafunso okhudza zomwe mumadziwa zokhudza zakudya zamagulu komanso za vuto la kuchepa kwa magazi.

Mafunso amene ndikufunseniwa mutha kuyankha mayankho monga eya,ayi kapena sindikudziwa

C1. Tchulani zinthu zomwe zimabweretsa/zimapangitsa vuto la kuchepa kwa magazi?

1	Kusowa kwa zakudya zakasakaniza.....	1
2	Kutaya magazi.....	2
3	Malungo.....	3
4	Likodzo.....	4
5	Njoka za mmimba.....	5
6	Matenda a mgonagona monga edzi ndi khansa.....	6
7	Zina	7

C2: Tchulani zizindikiro za vuto la kuchepa kwa magazi

1	Kuyezuka/kuyera mbee.....	1
2	Kuliralira.....	2
3	Kufooka.....	3
4	Kuthamanga mtima.....	4
5	Kupweteka kwa mutu	5
6	Chizungulire.....	6
7	Zina	7

Appendix G: Interview Guide

1. What do you think low blood level mean for your child?
2. What do you give your child in 24 hours?
 - How do you prepare the food?
3. How do you get food for the child and the family?
 - Do you have a garden?
 - Do you have adequate finances for buying food?
 - Is the food that you have sufficient for the whole year?
4. Perception of mothers related to anaemia in children
 - a) What do you think are the effects of anaemia in children?
 - b) Can traditional medicine prevent or help to heal anaemia?
 - Have you ever given your child any type of traditional medicine?
 - c) Can medications brought at the local market help to prevent or heal anaemia?
 - Have you ever given your child any medication brought at the market?
5. **Beliefs of mothers related to culture and religion**
 - a) What are your cultural beliefs related to nutrition in children
 - Does your culture encourage or prohibit certain types of food?
 - b) What are your cultural beliefs related to anaemia in children
 - Does your culture encourage or discourage you from going to hospital?
 - Does your culture encourage you to give child herbal concoctions?

- c) What are your religious beliefs related to nutrition in children
 - Does your religion encourage or prohibit certain types of food?

 - d) What are your religious beliefs related to anaemia in children
 - Does your religion encourage or discourage you from going to hospital?
6. Do you go with your child to underfive clinic?

- What is the distance from your home/village to the clinic?
- How do health workers treat you at the clinic?

7. Cues to action

- a) Have you ever received any information about nutrition for children?
 - If yes, where did you obtain information about nutrition?
 - What was it about?

- b) Have you ever received any information about anaemia and its prevention?
 - If yes, where did you obtain the information?
 - What was it about?

Appendix H: Mlozo wa zokambirana

1. Kodi maganizo anu ndi wotani tikanena kuti mwana wanu ali ndi vuto la kuchepa kwa magazi?
 2. Kodi mwana wanu mumamupatsa chani pa tsiku lonse (kuyambira mmamawa mpaka madzulo)?
 - Kodi chakudya chimene mumamupatsa mwana wanu mumachiphika bwanji?
 3. Kodi chakudya chimene mumamupatsa mwana ndi cha banja lonse mumachipeza bwanji?
 - Kodi muli ndi munda?
 - Kodi mumakhala ndi ndalama zokwanira zogulira chakudya
 - Kodi chakudya chimene mumachipeza kapena chimene mumalima chimakwanira mwezi wonse?
4. **Maganizo a amayi pankhani yokhudza vuto la kuchepa kwa magazi**
 - a) Kodi vuto la kuchepa kwa magazi litha kubweretsa zovuta zotani pa mwana?
 - b) Kodi mankhwala achikuda atha kuteteza kapena kuchiza vuto la kuchepa kwa magazi?
 - munayamba mwamupatsako mwana wanu mankhwala achikuda?
 - c) Kodi mankhwala ogula kusitolo atha kuteteza kapena kuchiza vuto lakuchepa magazi?
 - munayamba mwamupatsako mwana wanu mankhwala ogula kusitolo?

5. Zikhulupiliro za amayi zokhudza chikhalidwe ndi chipembedzo

a) Kodi zikhulupiliro za chikhalidwe kapena mtundu wanu zokhudza zakudya

zomupatsa mwana ndi ziti?

- Kodi chikhalidwe chanu chimaloleza kapena kuletsa mwana kudya zakudya ziti?

b) Kodi zikhulupiliro za chikhalidwe kapena mtundu wanu zokhudza vuto la

kuchepa kwa magazi ndi ziti?

- Kodi chikhalidwe chanu chimakulolezani kupita kuchipatala?
- Kodi nanga chikhalidwe chanu chimakulolezani kumupatsa mwana mankhwala
a zitsamba pamene wadwala?

c) Kodi zikhulupiliro zanu zachipembezo zokhudza zakudya zomupatsa mwana

kapena zoletsedwa ndi ziti?

- Kodi chipembedzo chanu chimaloleza kapena kuletsa mwana kudya zakudya ziti?

d) Kodi zikhulupiliro zanu zachipembezo zokhudza vuto la kuchepa kwa magazi

kwa mwana ndi ziti?

- Kodi chipembedzo chanu chimaloleza mwana kupita kuchipatala,
kulandira mankhwala kapena a magazi

6. Kodi mumamupitsa mwana wanu ku sikel?

- Kodi munatalikirana bwanji ndi chipatala chimene chili pafupi ndi kwanu?
- Kodi ogwira ntchito kuchipatala amakulandirani ndi kukuthandizani bwanji?

7. Zomwe zingapangitse amayi kuchitapo kanthu pa za chisamaliro cha mwana

- a) Kodi munamvako uthenga kapena kulandira uphungu okhudza za zakudya zakasakaniza zomwe mungamupatse mwana wanu?
 - Kodi uthengawu unali wotani ndipo munaumvera kuti?
- b) Kodi munamvako uthenga kapena kulandira uphungu okhudza za vuto lakuchepa kwa magazi kwa ana?
 - Kodi uthengawu unali wotani ndipo munaumvera kuti?

Appendix I: Permission Letter to Kamuzu Central Hospital Director

Kamuzu College of nursing

Private Bag 1

Lilongwe

23rd April 2014.

The Hospital Director

Kamuzu central hospital

P.O Box 149

Lilongwe.

Dear Madam,

PERMISSION TO CONDUCT A STUDY AT KAMUZU CENTRAL HOSPITAL

I write to request for the approval from your office to conduct research at your institution. I am currently studying Masters of Science degree in Child Nursing at Kamuzu College of nursing. As a partial fulfilment for the study, I am supposed to conduct research in my field of study.

The topic of my research study is **knowledge, beliefs and practices of mothers related to anaemia in underfive children at Kamuzu central hospital**. I hereby request your approval to conduct this study.

Your consideration will be greatly appreciated.

Yours faithfully,

Felistas Mphatso Macheso.

Appendix J: Permission letter from Kamuzu Central Hospital Director

REF. NO.
TELEPHONE NO.: (265) 753 555
TELE FAX NO.: (265) 756 380

PLEASE ADDRESS ALL
COMMUNICATIONS TO: THE
HOSPITAL DIRECTOR
E-MAIL: lch@sdnp.org.mw



KAMUZU CENTRAL HOSPITAL
P. O. Box 149
LILONGWE
MALAWI

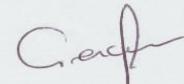
2ND MAY, 2014

The Chairperson
College of Medicine Research and Ethics Committee
Private bag 360,
Chichiri
BLANTYRE 3

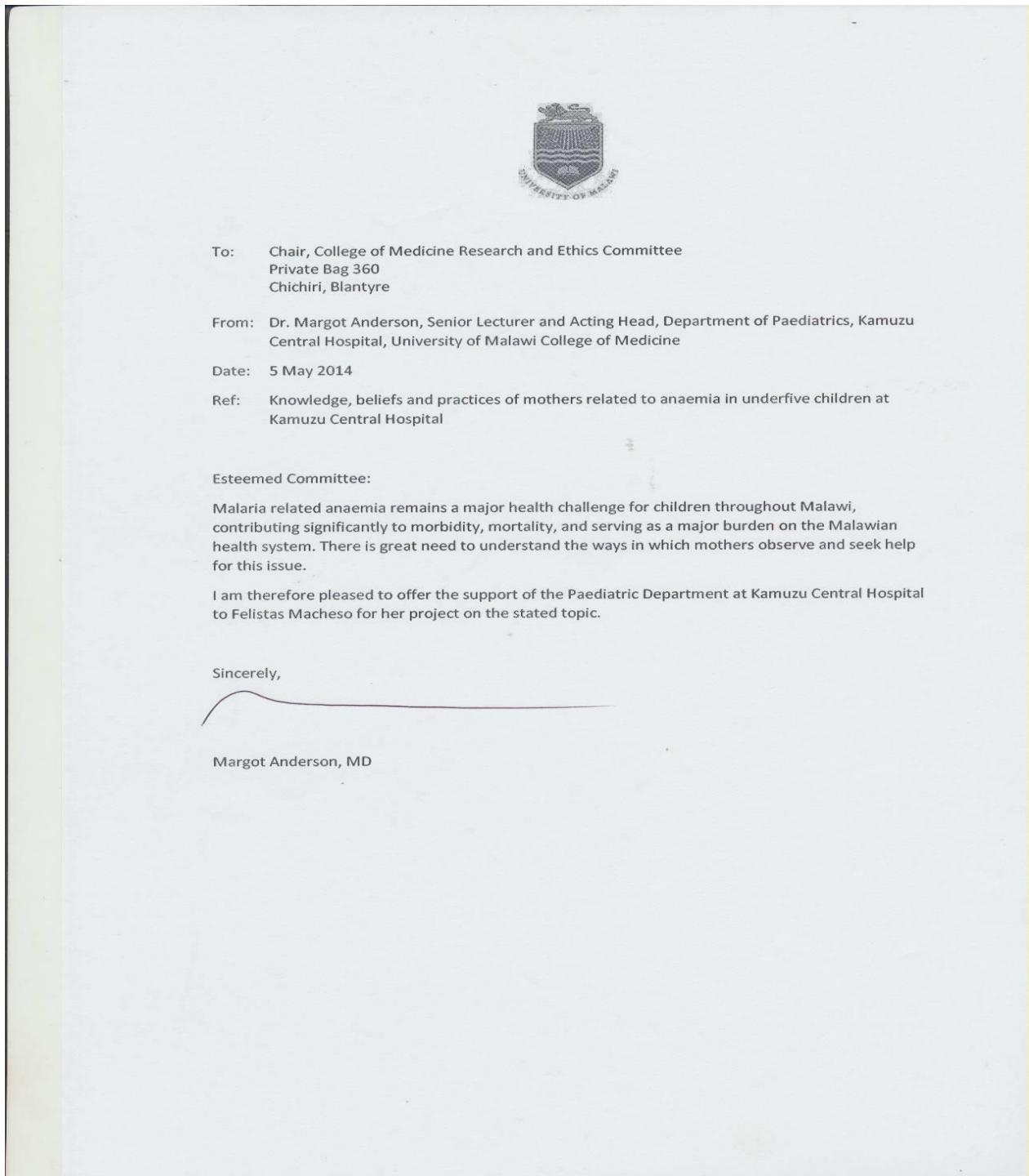
KNOWLEDGE, BELIEFS AND PRACTICES OF MOTHERS RELATED TO ANAEMIA IN UNDERFIVE CHILDREN AT KAMUZU CENTRAL HOSPITAL

Reference is made to the above mentioned study which is going to be run at Kamuzu Central Hospital by Felistas Macheso on the Knowledge, Beliefs and Practices of mothers related to anaemia in under-five children at Kamuzu Central Hospital.

I have seen the proposal and I am forwarding it to your committee for the approval process. Once approved, we will be happy to accommodate it in our hospital.


Dr. G. Chiudzu
THE HOSPITAL DIRECTOR

Appendix K: Permission letter from Kamuzu Central Hospital Paediatric Head of Department



Appendix L: Request Letter for Pretesting Of Research Instrument

REQUEST LETTER TO THE HOSPITAL DIRECTOR

Kamuzu College of nursing
Private Bag 1
Lilongwe
15th May 2014.

The Hospital Director
Likuni mission hospital
P.O Box 60
Lilongwe.

Dear Sir/Madam,

PERMISSION TO CONDUCT PRETESTING OF RESEARCH INSTRUMENT AT LIKUNI MISSION HOSPITAL

I write to request for the approval from your office to conduct pretesting of research instrument at your institution. I am currently studying Masters of Science degree in Child Nursing at Kamuzu College of nursing. As a partial fulfillment for the study, I am supposed to conduct research in my field of study.

The topic of my research study is **knowledge, beliefs and practices of mothers related to anaemia in underfive children at Kamuzu central hospital**. I hereby request your approval to conduct the pretest at your pediatric ward.

Your consideration will be greatly appreciated.

Yours faithfully,

Macheso.
Felistas Mphatso Macheso

*Approved
can go ahead
with the research
Johnji
17/5/14*



Appendix M: Certificate of Approval

