KWAME NKRUMAH UNIVERSITY OF SCIENCE AND

TECHNOLOGY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

POPULATION AND REPRODUCTIVE HEALTH

FACTORS INFLUENCING THE USE OF ANAEMIA PREVENTION STRATEGIES AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN THE BUNKPURUGU-NAKPANDURI DISTRICT

BY
MOSES MIIBOT BUNBOM
(PG3467218)

A DISSERTATION SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH,

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY IN

PARTIAL

FULFILLMENT FOR THE AWARD OF THE MASTER OF PUBLIC HEALTH (MPH)

DEGREE IN POPULATION AND REPRODUCTIVE HEALTH

SEPTEMBER 2019

DECLARATION

I, MOSES MIIBOT BUNBOM declare that this work is my own original work, investigations made by other people which were included in the preparation of this piece of work have been duly acknowledged and that this dissertation has not been presented elsewhere for a different degree.

…….. Date …….

MOSES MIIBOT BUNBOM

(Student)

…….. Date …….

DR. YEETEY A K ENUAMEH

(Supervisor)

DEDICATION

I dedicate this thesis to Almighty God, for his grace and mercy throughout my one year of studies, KNUST. I also dedicate it to my wife, Linda Jakon and my kids, Bernice and Flourish

ACKNOWLEDGEMENT

I thank the Almighty God for granting me good health, strength and understanding for the successful completion of this piece of work.

My deepest appreciation goes to my supervisor, Dr. Yeetey A. K Enuameh for his insightful comments that put me in the right direction allowing this dissertation to be my own work. I could not have done this without his guidance. I am most grateful to my family particularly my wife Linda Jakon, Children, Parents and my friends for their prayers, unfailing support and continuous encouragement throughout my period of study.

I am highly indebted to the entire staff of the Bunkpurugu Nakpanduri Health Directorate especially the District Director Mr Steven Mbabila Wuni, the Former Medical superintendent Dr Joseph Nindow of the Binde hospital and the entire staff. I would not have pursued this Masters programme without your support. I am also thankful to all the staff at the antenatal clinics for the support they gave me during the data collection.

I am also grateful to the entire research team, Alhassan Joseph especially your dedication and commitment lead to the successful completion of this piece of work. Finally to Hon. Minister Solomon Boar and my good friends Mr.Laar Stephen and Teenkwa Hezron Konlan thank you for your support.

ABSTRACT

The occurrences and prevalence of anaemia in Ghana remains a worrying phenomenon to the public health. It is endemic in all the regions of the country and affects so many pregnant women. The World Health Organization has put in place some measures to help prevent anaemia during pregnancy, which requires countries including Ghana to integrate into their antenatal care. This study aimed at determining the factors influencing the use of anaemia prevention strategies among pregnant women attending antenatal clinic in BunkpuruguNakpanduri District. The study adopted a crossed sectional study design and sampled three hundred and sixty (360) pregnant women as the participants using simple random sampling technique. Quantitative research method was adopted for the study and questionnaires were used in gathering data. The collected data was analysed quantitatively by the use of Statistical Packages for Social Sciences (SPSS version 20). Results revealed good knowledge and use of anaemia prevention strategies such as insecticide-treated net, use of iron supplements to the infant, food mix with nutrients and so on among pregnant women. The study also finds most of socio-cultural and health related factors such as attitude of health workers and availabilities of anaemia strategies among others to have no negative effects with regards to the use of anaemia prevention strategies. However, the study found a significant relationship between distance to health facilities and the use of anaemia prevention strategies. The study recommends more health facilities to be built in the district since distance to health facilities is found to have a significant association with the use of anaemia prevention strategies. The study also recommends more health education to be made about the important of using anaemia prevention strategies in study since some were having no knowledge on it

TABLE OF CONTENT

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Anaemia has become a matter of urgency to health professional all over the world. It has become a worldwide public health problem bothering the world with major consequences for the health of human population, social and economic development. It happens at all phases of the life cycle (World Health Organization, (WHO), 2001). The study further defined anaemia as a disease in which the body has a lower amount of haemoglobin than usual, which reduces the oxygen-carrying capacity of red blood cells to tissues. Globally, it is one of the most common deficiencies due to malnutrition. Though nutritional anaemia impacts both males and females and all groups of ages, but the most susceptible group is among women and adds to maternal morbidity and morbidity and low birthweight (WHO,1992).

According to WHO, United Nation Children Funds (UNICEF) and United Nations University (2001), deficiency of iron is the most common nutritional deficiency and the leading root of anaemia globally. WHO, (2001) approximations that iron deficiency is accountable for roughly 50% of all instances of anaemia. WHO and UNICEF (2004) have stated that incidence differs extensively in distinct environments, and there is often a lack of precise information. However, McLean (2009) specified that those residing in Asia and Africa are at biggest danger geographically.

Two billion individuals worldwide are anaemic, including 315 million in the South East Asia region (Hisano et al.2010). However, in 2008, the WHO estimate of anaemia incidence in Africa was 64.6 per cent, nearly 50 per cent greater than in Europe (16.4 per cent) and more than 60 per cent greater than in North America (3.4 per cent) (Benoist et al. 2008). In Ghana, the prevalence of anaemia is 66% among children aged 6–59 months and 42% among women

of reproductive age. There was a moderate reduction in the incidence of anaemia in children and women between 2008 and 2014; 12% for children and 16% for women (United States Agency for International Development (USAID), 2016). According to the Ghana Statistical Service (2009), regions that are most vulnerable and prevalent of anaemia rates are high in the parts of Northern and Central region mainly related to the fact that those are areas are mainly rural with high rate of poverty and low level of education. Again, in the same report it indicated that prevalence rate is 84.1% in rural and 67.9% in urban. Following this study, attempts have been made by Ministry of Health, Ghana Health Service, Food and Drugs Board and other government and NGOs to assist enhance the nutrition of children and pregnant women in particular over the years (Ghana News Agency, 2009).

Stoltzfus et al. (2004) noted that anaemia is a complex condition with many causes. One of the biggest contributors to anaemia is low intake of absorbable dietary iron to meet the needs of the body, particularly during adolescence and pregnancy, and during periods of rapid growth in childhood. Iron Deficiency Anaemia alone contributes to over 100,000 maternal deaths and 591,000 perinatal deaths each year. Iron Deficiency Anaemia is more common during pregnancy and in infancy, when iron requirements are higher. Nutrient deficiencies, such as vitamin A, folic acid, vitamin B12, and zinc also directly or indirectly contribute to anaemia. In the view of Balarajan et al. (2011), other causes of anaemia include malaria, helminthic infections, chronic infections like HIV and tuberculosis, causes related to reproduction and contraception, and genetic disorders such as thalassemia and sickle cell anaemia. Meanwhile, parasitic diseases are heavily related to numerous and interrelated risk variables, including: poverty, exposure to contaminated water and soil, bad hygiene practices, particularly in rural populations lacking enhanced water, sanitation and hygiene facilities

(Ziegelbauer, 2012). Resolution 65.6 of the World Health Assembly (WHA) in 2012 endorsed the Comprehensive Implementation Plan for Maternal, Infant and Young Child Nutrition, with

six Global Nutrition Targets for 2025 (Resolution WHA65.6, 2012). The second goal is a 50% decrease in anaemia in females of reproductive age (WRA, 15-49 years). Anaemia is linked to other Global Nutrition Targets; stunting, low birth weight, excluding other Global Nutrition Targets wasting and concentration actions are vital to reach the target of anaemia by 2025, and Sustainable Development Goals 2 and 3, by 2030.

Considering the enormous effect of anaemia on health and productivity, together with the reality that fragile populations (pregnant and lactating females) are not conscious of their health requirements and the ill impacts of anaemia on their health and kids stress the need to increase their consciousness and understanding by looking at variables that influence prevention and control strategies The catastrophic effects of anaemia in females range from enhanced fatigue, reduced cognitive ability, reduced productivity at job, and consequent financial expenses of enhanced morbidity and mortality. In reality, during pregnancy, females with serious anaemia have 3.5 times greater chance of dying from obstetric hitches as compared with non-anaemic pregnant women.

Added, inexpensive, durable and reliable technique for haemoglobin screening is required. Strengthening antenatal facilities, ensuring early detection of dropping haemoglobin and its subsequent management through the distribution of iron and folic acid tablets would be useful. Avoiding frequent childbirth through adequate family planning guidance is a requirement. There is an increasing need to concentrate on evidence-based approaches aimed at maternal and child health, adolescent health, secure motherhood (Upadhyay et al. 2012). Due to its low price and feasibility of use in clinical environments, anaemia is a frequently used measure of iron deficiency, often used to monitor the danger of iron deficiency in lowincome kids at the national and local levels (CDCP, 1998). In the views of White (2005) though the incident of anaemia is most commonly reported, awareness of anaemia incidence and identification of related ages and child features could assist to better target anaemiaprevention approaches.

In Ghana, the elevated incidence of infants under 2 years of age in the general population and, in specific, in rural kids is of specific concern. For infants under 2 years, this would likely be due to: a) high prevalence of maternal micronutrient deficiency since children born to malnourished mothers have poor stores of iron, zinc, vitamin A and B12 and folate (Neumann et al. 2004).

The case of Bunkpurugu-Nakpanduri District is not too far from what has been heighted above. In the light of this there is the need to investigate the factors influencing the use of anaemia preventing strategies among antenatal clinic attendants in the community to influence policy decision and implementation for better services and prevention of anaemia in the community as well as Ghana.

1.2 Statement of the Problem

Anaemia is one of the public health concerns that affects children and women in their life course and has higher burden on morbidity and mortality. Globally, it is estimated that 41.8% pregnant women are affected with anaemia while the United State of America has the lowest prevalence rate of 5.7% (Chathuranga et al. 2014). However, the rate of anaemia prevalence is higher in developing countries compared to the developed countries. For instance, Hu et al. (2012) found that anaemia among pregnant women in developing countries is four times more than those in developed countries. According to WHO (2013), anaemia affects more than 50% of pregnant women in the less developed countries.

Ghana has an anaemia prevalence rate of 70% as at the year 2000 which was very high (Bernard et al., 2001). Owing to the high incidence of anaemia among pregnant women, various prevention strategies were instituted by the government of Ghana to mitigate it. The study further finds some of the prevention strategies of anaemia in Ghana to be malaria prevention, diagnosis, and treatment; helminth prevention and control; and nutrition-related interventions

Despite these prevention strategies, there was a little decrease of the incidence of anaemia among pregnant women from 70% in 2000 to 54.3% (WHO, 2016). There are various factors that influence the successful implementation of these strategies. For example, Anand et al. (2008) reported that gastro-intestinal side effects did not encourage some pregnant women to comply with the routine treatment. Therefore, considering the socio-cultural characteristics of Bunkpurugu - Nakpanduri District, it is appropriate to find out the factors affecting the use of anaemia prevention strategies among antenatal clinic attendants.

1.3: Research Questions

The study tries to answer the following questions

1. What is the level of knowledge and uses of anaemia prevention strategies among women attending ANC.?
2. What is the sociocultural and health related factors influencing the use of anaemia prevention strategies?
3. What is the relationship between the various factors and the use of anaemia prevention strategies?

1.4 Study Objectives

The primary purpose of the study is to determine the factors influencing the use of anaemia prevention strategies among pregnant women attending ANC in the Bunkpurugu-Nakpanduri District. Specifically, the study sought to:

1. Determine the pregnant women‘s knowledge and uses of anaemia prevention strategies.
2. Assess the sociocultural and health related factors influencing the use of anaemia prevention strategies.
3. Determine the association between the various factors and the use of anaemia prevention strategies

1.5 Justification of the Study

It is evident that anaemia among pregnant women affects the health of individuals as well as people closer to these individuals. Therefore, it is a public health concerns to the global health community including Ghana because of this the World Health Organisation (WHO, 2013) has come out various strategies to prevent anaemia among pregnant women. Several researches compiled by WHO reveal that the strategies have been effective in reducing the danger of anaemia among pregnant women globally (WHO, 2015). The efficacy of these strategies has made the government of Ghana through the Ministry of Health and the Ghana Health Service adopt and

1.6 Significance of the Study

The findings of the study will be used by policy makers especially the Ministry of Health and the Ghana Health service to formulate health related policies that will help reduce anaemia among pregnant women. Non-governmental organisations in the health sector could adopt the findings of the study to educate pregnant women on the misconceptions about anaemia prevention strategies. It could also be a reference points for other knowledge seekers especially those who are concerned in the incidence of anaemia.

1.7 Organization of the Study

The study is structured into six interrelated chapters. Chapter one contains study background, statement of problem, research questions, objectives, purpose and ends with how the study is organized. Chapter two provides a theoretical and conceptual underpinning to the study in the form of literature review of relevant concepts and issues concerning the topic. The methodology used for the study is contained in chapter three. The chapter four contains a data presentation and analysis of data collected from the field. Discussions of the results is contained in chapter five and the last chapter which is chapter six provides a summary of the key findings from the study and provides recommendations to problems identified and conclusion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives deeper understanding of the concept of anaemia prevention strategies, the statistics of the anaemia prevention strategies and the other reviews based on the objectives of the study.

2.2 Definition of Anaemia Prevention Strategy

The strategies needed to prevent anaemia like any other strategy must be sustainable and involve various inputs and resources from a wide range of sectors and organizations. According to WHO (2016) anaemia prevention strategy is an approach that is multisectoral and developed to avoid anaemia and enhance the health conditions of children especially infants as well as mothers. Pringle and Seal (2013) also noted that this strategy provide funds and initiatives that improve anaemia control activities through the provision of standard nutrition and health care services. These are vital elements of any program to enhance nutritional well-being in overall, yet are significant particularly in the iron status in improvement. Though anaemia strategies have importance‘s, the notable one has been to shift mindsets towards the need for taking appropriate measure to prevent, rather than treatment only. Some of the strategies developed to control anaemia are; iron supplementation, malaria control interventions and de-worming. Lanka et al., (2016) also noted that food-based approach, exclusive breastfeeding, promoting safe water, sanitation and hygiene, prevention of infections such as malaria are some of the ways to prevent Anaemia. In the era of foodbased approach, WHO (2012) outlined dietary modification and fortification as a way of dealing with anaemia. Dickson (2016) argue that enhancing dietary modification remains an important intervention. They further stressed that it can be achieved through availability and accessibility of iron/micronutrient rich foods

increases, where the sectors of agriculture and education have an important role. In the era of agriculture, the process of food production, preservation, processing, marketing, must consider content micronutrient Also, awareness and practice improvement through counselling and behaviour change communication are important parts of improving diets. In advanced industrial countries, fortification of food is considered as the most effective cost technique for providing extra iron. But same situation cannot be applied in less-developed countries. Alberto and Almeida,(2018) claim that it very difficult to governor iron anaemia deficiency through distribution and consumption of ironfortified in the least developed countries.

The anaemia prevention strategy differs between infants and children. Exclusive breastfeeding of infants up to 6 months of age protects, promotes and supports the infant to fight iron deficiency WHO (2016). This is because breast milk is a vital source of iron for children and is highly bioavailable. Besides exclusive breastfeeding, other researchers identified complementary feeding as strategy that prevents infants from anaemia. For instance, Berhanu et al. (2018) noted that insufficient supplementing feeding practices in most of the countries in the developing world, with the part of children who obtain a minimum adequate diet being low. It should be noted that although exclusive breastfeeding is an appropriate measure to wards infants, it cannot be applied to pregnant women who are the target population for this study.

There are also scientific approaches to the prevention of anaemia. Such approaches are the control of anaemia through scientific means to include the use of iron medicine, pills, tablets, syrup and drug through several age treatment groups (children, mother, senior and woman).

Research has shown that single dose of anthelminthic administered in the second trimester of pregnancy is not linked with maternal anaemia in the third trimester (Salam et al., 2015).

However, anthelminthic improve anaemia status by decreasing intestinal blood loss, improving the absorption of nutrients, and increasing appetite. The scientific approach to the prevention

of anaemia has its own challenges. These includes accessibility, distribution, price and intake of iron drugs daily have been shown to present medicine supplementation difficulties in implementing this scientific strategy among all ages of anaemic population in the developing countries (Berhanu et al. 2018)

2.3 Anaemia Prevention Strategies during ANC period in the Globe

There are various strategies developed globally to deal with anaemia. For the global outlook, the World Health Assembly (WHA,2012) developed a framework in 2012 to prevent, control and treat women of reproductive age who have anaemia. The objective of the framework is to achieved a reduction of 50% in the incidence of anaemia among reproductive women of age by 2025. WHO, (2014) estimates that in order to achieve this target, it requires absolute reduction in the incidence of anaemia in this group by 6.1% yearly.

.Beforehand the global framework to tackle anaemia in 2012, Vietnam piloted a study in 2006 to distribute iron-folic acid weekly in addition to de-worming for all reproductive age women(15-45) in Yen Bai province, covering about 50 000 women After an assessment survey, it was realized that the incidence of anaemia fell from 38% at baseline to 19% after 12 months and 18% after 54 months of intervention; the prevalence of iron deficiency anaemia decreased from 38% at baseline to 19% at 12 months and persisted at 4% at the months of 54 which affirm that this condition had basically been eradicated in the population(Ikeanyi and Ibrahim 2015)

2.4 Anaemia Prevention strategies during ANC period in African.

In Africa, the role of early and quality antenatal care (ANC) as an anaemia prevention strategy maternal anaemia cannot be overemphasized. For instance, Ikeanyi and Ibrahim (2015) measured the haematocrit levels at booking per term and compared the part anaemic at booking with the part anaemic at term. This was done through a retrospective cross-sectional comparative study of 3442 prenatal women in Nigeria. The results showed that about 1205

subjects with of below of haematocrit 33% at reservation, an anaemia incidence of 32.2% at option in this population. Yet the study indicated that ANC visits did not actually reduce anaemia among pregnancy women although it is necessary.

Iron supplementation is one of the strategies developed by most African countries to control anaemia among pregnant women (Etheredge et al., 2015). In their study of the efficacy of pre-pregnancy supplementation with iron and multivitamins to lessen anaemia incidence during the periconceptional time amid rural women and adolescent girls in Tanzanian, they found that the level of haemoglobin was not diverse across treatments (median: 11.1 g/dL, Q1-Q3: 10.0–12.4 g/dL, p = 0.65). But in comparison with the folic acid arm (28%), the study found significant risk reduction of hypochromic microcytic anaemia in the folic acid and iron arm. The implication is that using iron supplementation as a strategy to control anaemia is effective. However, the researchers did not outline other factors such as fortified food and safe drinking water which could reduce the risk of anaemia among women.

There are other studies that have documented how ITNs have been used to reduce anaemia in Africa through the reduction of sickness and death related to malaria. For instance, WHO (2000) as cited in Lumos (2017) noted that the use of ITNs is gradually increasing with a shift from project based to operational implementation in Sub Saharan Africa. Thus, the use of ITNs should be a vital part of anaemia prevention strategies among African pregnant women.

2.5 Anaemia Prevention Strategies during ANC period in Ghana

There has been good advancement in anaemia-related preventing strategies, particularly with iron–folic acid (IFA) supplementation and malaria prevention in pregnancy. Ghose and Yaya (2018) indicates that there has been a high coverage of IFA supplementation in pregnant women and on preventive measure against malaria, pregnant women has improved between 2008 and

2014. However, deworming coverage did not improve from 2008 to 2014, thus remaining low, at 39% among pregnant women.

The use of various preventive strategies in the reduction of the risk of anaemia among pregnant women has also proven susceptible. Lumor et al (2019) noted in his study that only 30% women use anaemia intervention programs in the Kintampo North Municipality. The study furthered revealed that 100% among the women who use the interventions use iron supplements, while usage of ITNs and anthelminthic were 73% and 29% respectively.

Other studies have shown how the usage of fruits and other vegetables have the tendency of reducing anaemia because of their iron and vitamins in it. For instance, Ghose and Yaya (2018) noted that severe anaemia was among the urban women who consumed less than 5%.

2.6 Knowledge and use of anaemia prevention strategies among pregnant women

Knowledge of pregnant women about anaemia prevention strategies is an important factor in the usage of any of the strategies adopted. Das et al. (2017) found that postinterventional score on the five domains significantly improved and father's education were a significant predictor in periinterventional score. After health education intervention, knowledge score increased with a medium effect size.

Fredann et al. (2012) also reported in their research that the level of haemoglobin concentrations had been acquired from 171 pregnant females. Pregnant women with anaemic knowledge, attitudes and behaviours were likened to those without anaemia. This mixedmethod research was based on the Modified Ecological Model for Health Behaviour and Health Promotion. Participants scored a small (M=64 percent correct) score on a 10-item anaemia knowledge questionnaire. Forty percent of the respondents given incorrect data on enhancing the status of iron. Participants were likely to think that anaemia caused problems during pregnancy. Factors affecting the status of anaemia include (such as paints or dirt that have no nutritional value) the

studies specify that early prenatal intervention and financial security had a positive impact on anaemia status, whereas pica, and misinformation about anaemia prevention and treatment had a negative impact on participant anaemia status.

Crenshaw (2014) conducted a non-experimental descriptive study to assess the knowledge of antenatal 50 mothers from Yenepoya Medical College. The findings of the study indicate that the overwhelming majority of the antenatal mothers had satisfactory knowledge while a significant proportion of the respondents also had poor knowledge regarding anaemia during pregnancy. Since the knowledge was not all the good but satisfactory, the researcher emphasizes the need for more research to improve the knowledge of antenatal mothers on anaemia during pregnancy.

The burden and the predisposing variables also differ across nations. Ekwere et al. (2015) discovered that a total of 121 pregnant females with an average age of 25.69±4.51 years participated in the research. Most of them had post-primary education. Women had excellent understanding of anaemia during pregnancy. However, restrictions on food, including those wealthy in carbohydrates, proteins and alcoholic beverages (27.3 per cent, 14.9 per cent and 56.8 per cent respectively) were prevalent practice. Customs and religious beliefs had a significant impact on food constraints (50.8% and 28% respectively). Iron and folate supplementation, balanced diet, long-lasting insecticide net use, frequent ante-natal clinic visits, among others, were strategic participant strongly believes could assist ease against this situation.

Health facilities are, as anticipated, the primary source of iron supplements. Whether or not pregnant females actually take supplements, the research discovered that 22.5 per cent, 29 per cent and 33.8 per cent of females in the Central, Northern and Southern areas reported taking supplements for a month only during their latest pregnancy. Overall, about 9 per cent reported

taking supplements throughout pregnancy, but the percentage was greater in the Central and Southern (2.5 per cent) and Northern (0.5 per cent) areas. The single most significant reason for non-compliance was to report the revocation of nausea. On a favourable note, 47.4% of females in the Southern Region reported taking supplements.

2.7 Sociocultural and Health related factors that influence the use of anaemia prevention strategies

There are various health factors that are involved in the prevention of anaemia. One of such health-related factors is primary health care which is interested in the promotion of health and prevention of injuries and diseases (Gomez et al., 2016). Their study found that anaemia patients with acute episodes had access to the basic health unit only once and there was no priority given to anaemia patients. Less attention given to anaemia patients by primary health care providers are likely to worsen the plight of patients.

There is evidence that a third of patients admitted without anaemia develop after admission. For instance, a study conducted by Krishnasivam et al. (2018) in Western Australia found that inpatients had anaemia during admission and the longer the hospitalization, the easier the patient develops mild and moderate/severe anaemia. This means that hospitals that do not practice proper hygiene could pose risk to patients in developing anaemia.

Attitude of some health care providers of pregnant women with anaemia is one of the factors that affect the morbidity of anaemia. Onyeneho and Igweonu (2016) found that pregnant women bewailed the attitude of the health workers, who make access to these interventions difficult. Difficulty in accessing health facilities to deal with anaemia composites their problems and prolongs their illness.

All the prevention strategies in dealing with anaemia could be affected by socio cultural factors. Such factors limit the efficacy of the strategy in reducing anaemia among pregnant women.

Educated women and women whose husbands are present during ANC have been found as social variables that assist in the absorption of anaemia prevention strategies. For example, a study conducted by Chourasia et al. (2017) found that well educated women mostly adhere to recommended dose of iron supplements and women whose husbands are present during ANC visits are also likely to consume at least 90 days‘ iron supplement. This means that women need education to encourage the utilization of anaemia prevention strategies.

2.8 Relationship between the various factors and the use of anaemia prevention strategies

There are a number of literatures that links the use of anaemia prevention strategies to health related and socio-cultural background of the affected communities. The use of malaria prevention strategies can curb anaemia because malaria is known to increase the risk of anaemia. However, there are socio cultural aspects that influence the use of malaria prevention strategies. For instance, Zingani et al. (2017) found that educational level, occupation and monthly income significantly associated with knowledge of malaria transmission and prevention interventions.

There are other health related variables connected with the use of anaemia prevention strategies. In a linked research (Queiroz 2013). estimated the incidence of vitamin A deficiency and associated variables in a cross-sectional population-based research among 1121 participants and the findings showed incidence of vitamin A deficiency of 21.8%, showing connection with subclinical disease and absence of indoor plumbing. The incidence of vitamin A deficiency was 21.8%. After adjustment, vitamin A deficiency was discovered to be associated with subclinical infection and absence of indoor plumbing. Vitamin A deficiency was greater in kids with subclinical infection with wit at home.

Missagia et al. (2013) described how individuals relate to healthy foods, both of which show gender differences. Their outcome has shown that the primary distinction between the sexes is

the way they interpret health as a food choice motivation. Whereas males consider it essential that the products they consume maintain them healthy, females consider the fact that food decisions are nutritious to be more essential. This implies that gender could influence the use of anaemia prevention strategies based on the dietary food choices.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The research methodology and its associated methods are presented in this chapter. The outline is as follows: research design, study setting, study population, sampling procedures, and sources of data, data collection instruments, pre-testing, data collection procedures, data analyses and presentation as well as ethical consideration.

3.2 Research design

The study employed cross-sectional study design to examine the factors influencing the use of anaemia prevention strategies among pregnant women attending antenatal clinic (participants). Cross-sectional study is a collection of data at one point in time. It is carried out to obtain information that exists at that particular time (Sargeant 2012). The reason informed the choice of cross-sectional design was to assist the researcher to obtain information concerning the use of anaemia prevention strategies among pregnant women attending antenatal clinic in the Bunkpurugu - Nakpanduri District.

As it fits to the purpose of the study, this research design analysed the effect of the factors and anaemia prevention strategies. The justification for this method was that it provided insight into analysing anaemia prevention strategies.

3.3 Study Setting

The study was conducted at the Bunkpurugu Nakpanduri district. The District was established in August, 2004 with Legislative Instrument (LI) 1748 as Bunkpurugu Yunyoo District but in 2018 it further carved as Bunkpurugu Nakpanduri district and Yunyoo Nasuan district respectively. The district capital is Bunkpurugu. It was carved out of East Mamprusi District. The District has a population of 91,716 with an annual growth rate of 2.8% (GSS, 2010). Women with expected number of pregnancies are 3669 respectively thus 4% of the District total population. The Bunkpurugu-Nakpanduri District spells out that there are 4 health centers, which one (1) is a CHAG, 2 private clinics, 6 CHPS compound, and two Hospitals (one private one government) Binde Hospital which has been re-opened after a long period of closure.

3.4 Study Population

The population for the study was made up of all the pregnant women attending ANC services in the Bunkpurugu-Nakpanduri District. Ideally, the entire population that is identified in the study district should have be involved in the study. However, ideal conditions are difficult to meet. In this respect, the target population was limited to only pregnant women who attend in the 5 health facilities in the district. These five health facilities include: Binde Hospital, Bunkpurugu Health Centre, Nakpanduri Health Centre, Bimbagu CHPS Compound and Kambatiak CHPS Compound.

3.5 Sample size determination

A sample size of 360 respondents were selected for the study. Theses respondents were pregnant women who attend Binde Hospital, Bunkpurugu Health Centre, Nakpanduri Health Centre, Bimbagu CHPS Compound and Kambatiak CHPS in the study district. They were selected from the total population of 3669 following Jensen & Shumway (2010) procedure for sample size determination. The calculations are shown below;

$$n = \frac{N}{1 + N(e)^2}$$

Where n= sample size, N=

target population and

α= confidence level (95%)

e = Significant level of error (0.05) or 5%

(The acceptable sampling error)

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{3669}{1 + 3669(0.05)^2}$$

$$n = \frac{3669}{1 + 3669(0.0025)}$$

$$n = \frac{3669}{1 + 9.1725}$$

$$n = \frac{3669}{10.1725}$$

$$n = 360.7$$

3.6 Sampling Technique

Different types of sampling techniques were used to select respondents for the study. These sampling techniques were including random and convenience sampling techniques which means both probability and non-probability sampling techniques was used for the study. The simple random sampling random sampling was used to select 5 health facilities in the district from which pregnant women was selected to partake in the study after they have consented. In this regard, the participants were conveniently selected for the study after they have consented to respond to the questionnaire.

3.7 Sources of data

Both primary and secondary sources of data were used. Primary data was collected directly from the targeted respondents in the field by the researcher with the used of questionnaire. The target respondents are the pregnant women attending the ANC in the in the facilities of the district. While secondary data was obtained from textbooks, journals, government publications, periodicals, the internet as well. The purpose for collecting data from multiple source using multiple data collection instruments was to ensure that, data collected is rich and also confirm findings.

3.8 Data collection instrument

The study made used of the questionnaire as the instrument for data collection. As opined by Nowell et al (2017), data collected using questionnaires can be stable, constant and has uniform measure without variation. It also reduces bias caused by the researcher‘s presentation of issues. The questionnaire used was having both closed and opened ended questions which were necessary in solving the research objectives of the study. This questionnaire was having five sections. Section A addressed respondents‘ demographics. Section B addressed the knowledge of respondents on anaemia prevention strategies. Section C addressed respondents‘ use of anaemia prevention strategies including the different types. Section D addressed the health-related factors that influence the use of anaemia prevention strategies. Section E addressed the socio-cultural factors influencing the usage of anaemia prevention strategies. The questionnaire was pretested in Yunyoo Nasuan Distrct using respondents who are pregnant women and attending ANC before the actual data collection. This enable the researcher identify challenges with the questionnaire, and the necessary changes was made before the actual study (Polit & Beck, 2010).

3.9 Data collection procedure

The questionnaires were administered by the researcher through a face to face interview with the respondents selected for the study. Respondents were selected to respond to the questionnaires at the ANC health facilities that were selected for the study. The data collection took 3 weeks and 4 days each was appropriated to each health facility selected. A maximum of 20 minutes was spent with each respondent that agrees to partake in the study.

The confidentiality of the responses provided by the respondents was being assured.

3.10 Data analyses and presentation

According to Bernard (1998), data analysis consists of systematically looking for patterns in recorded observations and formulating ideas that account for those patterns. Data collected through the field survey was examined and edited to ensure consistency of responses. Quantitative technique was used to analyse the data for the study. The primary data collected with questionnaire was coded and entered in Statistical Package for Social Science (SPSS version 20) software through the computer. Some tools such as descriptive statistics and correlation of the SPSS software were employed to analyse the inputted data. The result of these analyses was presented in the form of descriptive statistics such as frequency distribution table, binary logistic regression and percentage. The reasons for this form of presentation are that, it is easier to understand, convenient and more reliable.

3.11 Ethical Consideration

Ethical approval was sought from the Committee on Human Research, Publication and Ethics (CHRPE) of the KNUST ahead of the study. The study proposal, data collection tool, consent forms and other relevant document was submitted to the ethics review committee for consideration. An introduction letter was sought from the District Director of Ghana Health Service sand a copy shown to respondents to gain their consent. Permission was also sought from the various assemblymen in the District by giving a copy of the introduction letter which

explained the purpose of the study and the benefits to the pregnant women. The questionnaire was confidential and anonymous. The questionnaire was also processed and packaged safely. Confidentiality was assured by respecting clients‘ right to privacy and information given. No information was passed on to anyone so as to disallow for the possibility of identifying persons completing the forms.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the results of the data collected to investigate factors influencing the use of anaemia prevention strategies among women attending antenatal clinic in the BunkpuruguNakpanduri District. For clarity in data presentation and analysis, data is organized in subthemes in line with the study objectives but begins with respondents ' demographic features reflecting on the questionnaires used.

4.2 Demographic features of respondents

Table 4.1 is a descriptive statistic of the demographics features of the respondents. These features were evaluated based on their marital status, age, ethnicity, educational level as well as occupation. From the table, 184 (51.1%) of the respondents were aged between 20-29 years. This was followed by 115(31.9%) aged between 30-39 years, 38(10.6%) aged less than 20 years and only 23 (6.4%) respondents were aged between 40-49 years. With regards to their marital status, the overwhelming majority 285 (79.2%) were married while 55 (15.3%) and 10(2.8%) of the respondents were single and divorced or windowed respectively. On the ethnic group, Bimoba is dominated making up to 228(63.3%) of the respondents surveyed. Others ethnic groups surveyed were Komkonba 68(18.9%) and Mamprusi 64(17.8%). On educational level, 119 (33.1%) representing the majority of the respondents had basic education, 95 (26.4%)

had secondary education, 38 (10.6%) had tertiary education but a significant proportion of 108(30.0%) had no formal education. More so, majority 252(70.0%) of the respondents surveyed were affiliated to Christianity, followed by Islam 77(21.4%) and the least were Traditionalist 31(8.6%). The results also show that 101 (28.1%) of the respondents were engaged in petty trading, 83 (23.1%) were unemployed, 58 (16.1%) farming, 36 (10.0%) hairdresser and the least being civil servant 32 (8.9%)

Table 4.1: Demographic characteristics of respondents in the Bunkprurgu-Nakpanduri District

Variable	Category	Frequency(N=360)	Percentage (%)
Marital status	Married	285	79.2
	Divorced	10	2.5
	Single	55	15.3
	Widowed	10	2.5
Age	<20	38	10.6
	20-29	184	51.1
	30-39	115	31.9
	40-49	23	6.4
Ethnicity	Bimoba	228	63.3
	Konkomba	68	18.9
	Mamprusi	64	17.8
Education	No formal Education	108	30.0
	Basic	119	33.1
	Secondary	95	26.4
	Tertiary	38	10.6
Occupation	Petty Trading	101	28.1
	Civil servant	32	8.9
	Seamstress	50	13.9
	Hairdresser	36	10.0
	Unemployed	83	23.1

	Farming	58	16.1
Religion	Christianity	252	70
	Islam	77	21.4
	Traditional	31	8.6

4.3 Knowledge and use of Anaemia prevention strategies

4.3.1 Knowledge on Anaemia prevention strategies

One of the specific objectives was to assess the knowledge of women regarding strategies in preventing anaemia. To examine this objective, respondents were being given statements and requiring them to indicate their level of knowledge on anaemia prevention strategies by ticking, very poor, poor, moderate, good and very good. Table 4.2 shows only the responses of the respondent‘s knowledge. Some of the respondents were having good 143(39.7%) and very good 138(38.3%) knowledge on the use of insecticide treated net as a prevention strategy for anaemia with only few 18(5.0%) cited to have poor knowledge on it. Like the respondents knowledge on the use of insecticide treated net, most of them indicated to have very good and good knowledge on using iron supplements to the infant 117 (32.5%) and 115 (31.9%), food mix with nutrients 90 (25.0%) and 148 (41.1%), breast feeding alongside with others foods 157 (43.6%) and 128 (35.6%) and improvement in the nutrition of the infants 174 (48.3%) and 138 (38.3%) respectively as prevention strategies of anaemia.

Their good knowledge of these strategies could be partly attributed to the activeness of health workers as the overwhelming majority 284 (78.9%) of respondents reported to have had their sources of information from the health workers. Other sources of their information were from school 26 (7.2%), friends 19 (5.3%), radio 18 (5.0%) and relatives 13 (3.6%) in order of magnitude (Table 4.3). Nevertheless, some of the respondents reported to have moderate and

poor knowledge on those strategies especially the strategies of iron supplements to the infant and food mix with nutrients (Table 4.2).

Table 4.2: Knowledge on Anaemia prevention strategies by respondents in the Bunkprurgu-Nakpanduri District

Anaemia prevention strategies	Very poor Freq.(%)	Poor Freq.(%)	Moderate Freq.(%)	Good Freq.(%)	V. Good Freq.(%)
Use of insecticide treated net	24 6.7	18 5.0	37 10.3	143 39.7	138 38.3
Iron supplements to the infant	13 3.6	36 10.0	79 21.9	115 31.9	117 32.5
Food mix with nutrients	12 3.3	29 8.1	81 22.5	148 41.1	90 25
Breast feeding alongside with other foods	8 2.2	25 6.9	42 11.7	128 35.6	157 43.6
Provision of breast milk to the infant	4 1.1	16 4.4	28 7.8	138 38.3	174 48.3
Improvement in the nutrition of the infant	17 4.7	25 6.9	58 16.1	143 39.7	117 32.5

***Source**: Field survey, 2019*

Table 4.3: Respondents sources of knowledge of anaemia prevention strategies by respondents in the Bunkprurgu-Nakpanduri District

Sources	Frequency(N=360)	Percentage (%)
Health workers	184	78.9
Friends	19	5.3
Relatives	13	3.6
Radio	18	5.0
School	26	7.2

***Source**: Field survey, 2019*

4. 3.2 Use of anaemia prevention strategies

The majority of (91.1%) of the respondents agreed that they have ever used anaemia prevention strategies**.** Table 4.4 is a summary of their response showing the types of anaemia prevention strategies they have ever used. The results show that 302 (84.4%) of the respondents used ITNs

before while 56 (15.6%) of the respondents do not use. In addition, 206 (57.2%) have used fortified foods before while 154(42.8%) did not use. Moreover, majority 303 (84.2%) used iron supplement while 57 (15.8%) do not use. Again, majority 307 (85.3%) and 283 (78.6%) of the respondents used breast milk and breastfeeding alongside other food respectively. Lastly, majority 283 (78.6%) of the respondents did use nutritional improvement as anaemia prevention strategy while 77 (21.4%) of the respondents did not use

(Table 4.4).

Table 4.4: Use of prevention strategies by respondents in the Bunkprurgu-Nakpanduri District

Used strategies	YES		NO	
	Freq.	(%)	Freq.	(%)
Use of ITNs	304	84.4	56	15.6
Fortified food	206	57.2	154	42.8
Iron supplement	303	84.2	57	15.8
Breast milk	307	85.3	53	14.7
Breast feeding alongside with others foods	283	78.6	55	15.3

***Source**: Field survey, 2019*

4. 4 Health related factors that influence the use of anaemia prevention strategies

4.4.1 Perceived socio-cultural factors anaemia

The perceived socio-cultural factors that influence the use of anaemia preventing strategies were also studied. Several factors were given to the respondents and required them to tick either Yes or No as a factor affecting their use of anaemia preventing strategies. Table 4.5 shows the responses given by the respondents. Majority 290 (80.6%) of the respondents said No their cultural values does not negatively affect the use of anaemia prevention strategies while the rest 70(19.4%) agreed Yes. These cultural values were cited to be taboos in their family clan that do not permit them to use some of the anaemia prevention strategies. When asked whether

they abide by these cultural values on not, 66 (94.3%) say yes, they abide while only few 4 (5.7%) say no.

The respondents were also asked whether their social values allow them to assess anaemia prevention strategies, while majority 237 (65.8%) responded consistently to the statement others 123 (34.2%) say no. The income level of the respondents, and the social status were factors that affect the use of anaemia prevention strategies to the majority of respondents 218 (60.6%) and 200 (55.6%) respectively. While significant proportions of them do not see it to be factors that affects their use of anaemia preventing strategies representing 132 (39.4%) and 160 (44.4%) respectively. The study also takes into consideration whether the work does by the respondents do influence their use of anaemia prevention strategies or not. It was revealed by the majority 187 (51.9%) of the respondents that their work does not negatively affecting their use of anaemia preventing strategies (Table 4.5)

Table 4.5: Socio- cultural factors that influence the use of anaemia prevention strategies in the Bunkprurgu-Nakpanduri District

Socio-cultural factors	**YES**		**NO**	
	Freq.	**(%)**	**Freq.**	**(%)**
Effects of the cultural values on the use of anaemia prevention strategies	70	(19.4)	290	(80.6)
Obedience of those cultural values	66	(94.3)	4	(5.7)
Influence of the social values on the use of anaemia prevention strategies	237	(65.8)	123	(34.2)
Influence of the level of income on the use of anaemia prevention strategies	218	(60.6)	142	(39.4)
Influence of work on the use of anaemia prevention strategies	173	(48.1)	187	(51.9)
Influence of social status on the use of anaemia prevention strategies	200	(55.6)	160	(44.4)

***Source**; Field survey, 2019*

4.4.2: Perceived health related factors that influence the use of anaemia prevention strategies

There were some of the perceived health-related factors that influence respondents use of the anaemia prevention strategies as reported by the majority 293 (66.7%) of the respondents. However, a significant proportion of (33.3%) respondents surveyed say no, they have not experienced any health-related factor that influence their use of anaemia prevention strategies. Table 4.6 presented the results of those who were in the agreement with the statement. The overwhelming majority 260(88.7%) of respondents said they had encouragement from health workers when utilizing health services while the remaining said no. Also, majority 210 (71.7%) of the respondents disagreed that distance discouraged them from utilizing anaemia prevention strategies while 83 (28.3%) of the respondents agreed. With regards to the availabilities of the anaemia prevention drugs at the health facility, majority 215 (74.4%) of the respondents disagreed that No anaemia drugs at health facility while the remaining of 78 (26.6%) respondents agreed. The availability of these anaemia prevention strategies was mentioned to be insecticide treated nets, iron supplements, anthelminthic, sulpphadoxine pyrimethamines. Finally, majority 245(83.6%) of the respondents said there was availability of anaemia prevention strategies when utilizing health services while the remaining said no.

Table 4.6: Health related factors that influence the use of anaemia prevention strategies in the Bunkprurgu-Nakpanduri District

Health related factors	YES		NO	
	Freq.	(%)	Freq.	(%)
Attitude of health workers encourage me	260	(88.7)	33	(11.3)
Distance of health facility discourage me	83	(28.3)	210	(71.7)
Health facility did not have anaemia drugs	78	(26.6)	215	(74.4)
Health facility have anaemia prevention strategies	245	(83.6)	49	(16.4)

***Source**; Field survey, 2019*

4.5 Relationship between the various factors and the use of anaemia prevention strategies

4.5.1 Socio-cultural factors and the use of anaemia prevention strategies

The relationship between socio-cultural factors and the use of the anaemia prevention strategies were also study. Table 4.7 is a binary logistic regression showing the relationships. The results from the table revealed that socio-cultural values have no significant association with regard to the use of anaemia prevention strategies since their significant values are greater than the conventional significance level of 0.05. For cultural values, respondents who are not affected by it with regard to the use of anaemia prevention strategies are 1.957 times more than those whose are likely to be affected. Also, those respondents who are not abide by the taboos are 0.616 times less than those who are likely to abide. In addition, respondents who social values are not negatively affecting their use of anaemia prevention strategies are 1.814 times more than those who are likely to be affected by their social values. With regard to income level, those who are not likely to be affected are 1.714 times more than those who are affected with regard to the use of anaemia prevention strategies. Lastly, 1.318 and 1.221 of the respondents are not likely to be affected by their work and social values respectively with regards to the use of anaemia prevention strategies which is more times those who are likely to be affected.

Table 4.7: Association between socio-cultural factors and the use of anaemia prevention strategies in the Bunkprurgu-Nakpanduri District

Socio-cultural factor	Category	OR	95.0% for CI	P-Value/Sig.
Cultural values	YES(Ref) NO	1.00 1.957	0.615-6.229	0.256
Abide by taboos	YES(Ref) NO	1.00 0.616	0.193-1.966	0.413
Social values	YES(Ref) NO	1.00 1.814	0.811-4.057	0.147
Taboos affects	YES(Ref) NO	1.00 0.472	0.162-1.379	0.170

Income level	YES(Ref) NO	1.00 1.714	0.722-4.069	0.222
Work does	YES(Ref) NO	1.00 1.318	0.526-3.299	0.556
Social Status	YES(Ref) NO	1.00 1.221	0.516-2.888	0.650

Ref= Reference group=1.00

4.5.2 Heath related factors and the use of anaemia prevention strategies

Table 4.8 is the binary logistic regression showing the results of the association between health-related factors and the use of the anaemia prevention strategies. From the table, distance to the health facility was only found to have a significant association with the use of anaemia prevention strategies since its significant value (0.001) is less than the conventional significance level of 0.05. The others health related factors such as attitude of health workers, un availability of anaemia drugs and availability of anaemia prevention strategies were found to have no statistically significant association with regards to the use of anaemia prevention strategies as their p-values are greater than 0.05.

Table 4.8: Association between health-related factors and the use of anaemia prevention strategies

Health Related factors	Category	OR	95.0% for CL	P-Value/Sig.
Attitude of health workers	YES(Ref) NO	1.00 1.080	0.329-3543	0.900
Distance to the health facilities	YES(Ref) NO	1.00 0.244	0.103-0.579	0.001
Un availabilities of anaemia drugs at the health facility	YES(Ref) NO	1.00 0.552	0.232-1.314	0.179
Availabilities of anaemia prevention strategies	YES(Ref) NO	1.00 1.183	0.423-3.312	0.748

Ref= Reference group=1.00

CHAPTER FIVE

DISCUSSIONS OF THE RESULTS

5.1 Introduction

This chapter presents the discussions of the study findings. The discussions are in line with the study objectives.

5.2 Discussions of the study findings.

The study examines factors influencing the use of anaemia prevention strategies among pregnant women attending antenatal clinic in Bunkpurugu-Nakpanduri District.

5.2.1 Knowledge and use of anaemia prevention strategies among pregnant women.

Findings from the study revealed that pregnant women in the study district have good knowledge of anaemia prevention strategies. Those anaemia prevention strategies that were reported by the overwhelming majority of the respondent include insecticide-treated net, use of iron supplements to the infant, food mix with nutrients, breastfeeding alongside with other food and improvement in the nutrition of the infant. The sources of information of this knowledge as were reportedly by the majority of the respondents were from the health workers in the study area while some also indicated to have had their information from the relatives, friends, school and radio. The finding of the good knowledge of iron supplements to the infant as anaemia prevention strategies are consistent with a previous study that find the majority (53%) of pregnant women to have good knowledge of iron supplements as anaemia preventives strategies in Srinagar (Mukhtar et al., 2018).

The good knowledge of anaemia prevention strategies demonstrated by the overwhelming majority of the respondents was positively correlated with it used. The use of the anaemia prevention strategies was relatively high as the majority of the respondents reported having ever used these strategies including insecticide-treated net, iron supplements to the infant, food

mix with nutrients, breastfeeding alongside with others food and improvement in the nutrition of the infants. These findings of the high use of anaemia prevention strategies is in line with the previous studies (Gebreamlak, et al., 2017; GSS 2014) conducted globally. For instance, GSS (2014) find high use of iron supplements among pregnant women in Ghana while Gebreamlaket al. (2017) reported that (99%) pregnant women using iron supplement in Akaki Kality Sub-city in Ethiopia. The use of iron supplement in this current study was found to be (84.2%) which is inconsistent with the previous studies. Also, the use of ITN among pregnant women in the current study was as high as (84.4%) which corresponds to a study conducted by (Kuile et al, 2003) in Western Kenya which finding show that (85%) of pregnant women use ITNS. This finding, however, contradicts with the NMCP (2013) which reported low (33%) usage of ITN among pregnant women in Ghana. The reason accounted for the high usage of ITN in the current study may be due to the increase in ITN ownership because of free delivery of ITNs in ANCs and child welfare clinics since 2013.

The study also finds that some of the respondents were found to have never use the anaemia prevention strategies before but were few. The strategies that they were found not to have used before including use of breastfeeding alongside with other foods. This could have a negative effect on them especially their children‘s. As identified by other researchers, exclusive breastfeeding is a complementary feeding strategy that prevents infants from anaemia (Habtewold et al. 2018). They noted that insufficient complementary feeding practices in most of the developing countries, with the proportion of young children who receive a minimum acceptable diet being low.

5.2.2 Health-related factors that influence the use of anaemia prevention strategies

Finding from the study also revealed that the use of anaemia preventives strategies in the study area are influenced by some of the health-related factors. These health-related factors are attitudes of health workers, availability of anaemia preventing strategies at the health facility

such as iron supplements, anthelminthic, ITN among others, and distance to health facilities. The majority (58.3%) of the study participants indicated that proximity to the health facility was not negatively affecting their use of anaemia preventing strategies. This finding, however, contradicts with a study by (Bedwell et al., 2017) whose finds proximity to a health facility to be a major factor in pregnant woman‘ decision to obtain iron pills as anaemia preventing strategies in Bolivia. The proximity to health facilities being not the factor affecting respondents use of anaemia prevention strategies could be attributed to the fact that most of them are from pre-urban communities where health facilities are available to them. Nevertheless, some (23.1%) who might have been from the rural communities complained that health facilities are discouraging their use of anaemia prevention strategies.

The finding of attitudes of health workers, others were positively affecting the majority of (72.2%) pregnant women use of anaemia prevention strategies in the current study. This, however, conflicts with a previous study by Onyeneho & Igweonu (2016). Their finding indicated pregnant women to be bewailing the attitude of the health workers, who make access to these interventions difficult. Other health-related factors that was found to be a factor influencing the majority of the respondents' use of anaemia prevention strategies are the availability of anaemia preventing strategies at the health facility such as iron supplements, anthelminthic which affirms a previous study by (Gebreamlak, et al., 2017).

5.2.3 Socio cultural factors that influence the use of anaemia prevention strategies

Socio cultural factors that influence the use of anaemia prevention strategies were also studied. The results show that cultural values in the study area were not a detrimental factor in the use of anaemia prevention strategies to most of the pregnant women. This notwithstanding, some were affected by the cultural values that do not permit them to use anaemia prevention strategies. These cultural values were explained to be the family taboos.

The study also takes into considerations the influence of their social values on the use of anaemia preventing strategies. Finding suggests that social values were not negatively affecting their use. However, income level and social status are factors that negatively affect the use of anaemia preventing strategies to the majority of them (60.6%) and (55.6%) respectively. The finding of income as a factor affecting the use of anaemia prevention strategies is in agreement with a study by Zingani et al., (2017) that found monthly income to have significantly associated with knowledge of malaria transmission and prevention interventions, thus affecting their use of anaemia prevention strategies.

Chourasia et al. (2017) noted that well-educated women mostly adhere to the recommended dose of iron supplements and women whose husbands are present during ANC visits are also likely to consume at least 90 days' iron supplement. This means that women need education to encourage the utilization of anaemia prevention strategies. Yet still, most of the cultural values in the rural areas of Ghana do not permit girl child education which was evident from the study respondents while most of them had never been to school before and those who have ended up in the basic level. Also, most of the men in Ghana do not go with their wives to the health centers, meanwhile study has shown that when husbands are present during

ANC visits the wife is likely to consume at least 90 days' iron supplement (Chourasia et al., 2017).

4.5 Association between the various factors and the use of anaemia prevention strategies

Finding from the study revealed that there is no significant relationship between sociocultural factors such as cultural values, taboos, income level among others with regard to the use of anaemia prevention strategies. This finding however inconsistent with a previous study by Zingani et al., (2017) that found socio-cultural factors such as monthly income to have significantly associated with the use of anaemia prevention strategies. The current study also

found no significant relationship between health-related factors such as the attitude of health workers, unavailability of anaemia prevention drugs, availabilities of anaemia strategies but found significant relationship of distance to health facilities with regard to the use of anaemia prevention strategies.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter summarizes the study as well as the findings obtained from the field and draws conclusion base on the key findings of the study. In order to facilitate understanding, the findings have been summarized in chronologically order in line with the objectives of the study. The chapter also made some recommendation based on the problems identified. These recommendations had been made to help in decision making when needed.

6.2 Summary of the study

The study sought to examine factors influencing the use of anaemia prevention strategies among pregnant women attending antenatal clinic in Bunkpurugu-Nakpanduri District. Five 5 health facilities including Binde hospital, Bunkpurugu Health Centre, Nakpanduri Health Centre, Bimbagu CHPS Compound and Kambatiak CHPS in the district were purposefully chosen for the study. The study aimed at achieving three specific objectives; knowledge and use of anaemia preventives strategies among pregnant women, health-related and sociocultural factors influencing the use of anaemia preventive strategies. The study is a crossed sectional study design and sampled three hundred and sixty (360) pregnant women as the participants using simple random sampling technique. Quantitative research method was adopted for the study and questionnaires were used in gathering data. The collected data was analysed quantitatively by the use of Statistical Packages for Social Sciences (SPSS) software through the computer. The results of the analyses are presented in descriptive statistics such as frequency distributions tables and percentages.

The following are the major findings

The study finds that pregnant women knowledge on anaemia preventive strategies was good in the study areas. Theses preventives strategies include use of the insecticide-treated net, use of iron supplements to the infant, food mix with nutrients, breastfeeding alongside with others food and improvement in the nutrition of the infants. Their sources of information were from health workers, school, friends, radio, and relatives in order of magnitude. However, few respondents reported to have moderate and poor knowledge on those strategies especially the strategies of iron supplements to the infant and food mix with nutrients. The knowledge of these strategies was reflected in the use of pregnant women. Majority of the respondent interviewed reported to have ever used some of these anaemia preventives strategies. The study also finds that the high usage of the anaemia preventive strategies was influenced by some health-related factors including the attitude of health workers, availability of anaemia preventing strategies at the health centre such as insecticide-treated nets, iron supplements among others, distance to health statement amongst others. However, some complained that whenever they asked of the drugs, they often not given by health facility, thus is influencing them not to use the anaemia preventing strategies. The study again finds that socio-cultural factors especially cultural values, work, and social values were not negatively affecting the use of anaemia preventing strategies by the majority of the respondents. But interestedly, the study found no significant relationship with regards to the socio-cultural factors and the use of anaemia prevention strategies.

6.3 Conclusions

The knowledge and use of anaemia preventing strategies such as insecticide-treated net, use of iron supplements to the infant, food mix with nutrients and so on among pregnant women in the Bunkpurugu-Nakpanduri District in this study was good. Heath and socio-cultural factors that significantly influenced the knowledge and use of the anaemia preventing strategies among pregnant women in the study were the attitude of health workers, availabilities of anaemia

preventing strategies among others and favourable cultural values, work and social values respectively. However, it important to note that some of the respondents were negatively affected by their cultural value, income and social status which does not allow them to fully utilize anaemia preventives strategies.

6.4 Recommendations

In light of the findings and problems identified, the study put forward the following recommendations. The study recommends more health education to be made about the importance of using anaemia preventing strategies in the district since some did not have good knowledge about them especially food mix with nutrients, iron supplements to the infant. Public health authorities should adopt a mass awareness campaign to educate mothers on early initiation and constant attendance of ANC. Also, poverty reduction programs should be extended to these areas to reduced over-dependence of the environment as an alternative income-generating activity. Municipal Assembly in collaboration with NGOs should spearhead these programs. Such programs can include providing assistance to them to improve shear butter processing, poultry among others. This will help them gain income; thus, will be able to use anaemia preventing strategies since most of them were not using it become of income. More so, cultural values such as denying girls from education among others should be abolished. This will help them improve to be educated and as such gain more knowledge on the anaemia preventing strategies. Lastly, more health facilities should be built in the district since distance to health facilities was found to have a significant association with the use of anaemia prevention strategies.

REFERENCES

Abarca-Gómez, L., Abdeen, Z. A., Hamid, Z. A., Abu-Rmeileh, N. M., Acosta-Cazares, B., Acuin, C., & Agyemang, C. 2017. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based

measurement studies in 128· 9 million children, adolescents, and adults. *The Lancet*, *390*(10113), 2627-2642.

Anand, P., Kunnumakara, A. B., Sundaram, C., Harikumar, K. B., Tharakan, S. T., Lai, O. S., & Aggarwal, B. B. 2008. Cancer is a preventable disease that requires major lifestyle changes. *Pharmaceutical research*, *25*(9), 2097-2116.

Balarajan, Yarlini, Usha Ramakrishnan, Emre Özaltin, Anuraj H Shankar, and Sv Subramanian 2011. ―Anaemia in Low-Income and Middle-Income Countries.‖ The Lancet 378 (9809): 2123–35. doi:10.1016/S0140-6736(10)62304-5

Bedwell, C., Levin, K., Pett, C., & Lavender, D. T. 2017. A realist review of the partograph: when and how does it work for labour monitoring. *BMC pregnancy and childbirth*, *17*(1), 31.

Benoist BD, McLean E, Egll I, Cogswell M: Worldwide prevalence of anaemia 1993–2005: WHO global database on anaemia. In WHO. Geneva, Switzerland: WHO Press; 2008. ISBN 978941596657.

Berhanu, K., Jayanthiogopa and Bayissa, D. 2018. _Assessment of Knowledge and Practice Towards Prevention of Anemia Among Pregnant Women Attending Antenatal Care at Government Hospitals in West Shoa Zone , Ethiopia‘, *Journal of Health, Medicine and Nursing*, 50(5), pp. 31–40.

Centers for Disease Control and Prevention 1998. Recommendations to prevent and control iron deficiency in the United States. MMWR Morb Mortal Wkly Rep 1998; 47:1-29 World Health Organization WHO, 2001. Estimates of iron deficiency is responsible for approximately 50% of all anaemia cases WHO, UNICEF and UNU, 2001.

Chathuranga, G., Balasuriya, T., & Perera, R. 2014. Anaemia among female undergraduates residing in the hostels of University of Sri Jayewardenepura, Sri Lanka. *Anemia*, *2014*.

Crenshaw, J. T. 2014. Healthy birth practice# 6: Keep mother and baby together—It's best for mother, baby, and breastfeeding. *The Journal of perinatal education*, *23*(4), 211-217.

Das, N., Mandala, A., Naaz, S., Giri, S., Jain, M., Bandyopadhyay, D., ... & Roy, S. S. 2017. Melatonin protects against lipid‐induced mitochondrial dysfunction in hepatocytes and inhibits stellate cell activation during hepatic fibrosis in mice. *Journal of pineal research*, *62*(4), e12404.

Dickson Patience, 2016. knowledge and perception of risk of anaemia during pregnancy among pregnant women in ablekuma south.

E. McLean, M. Cogswell, I. Egli, D. Wojdyla, and B. De Benoist 2009. ―Worldwide prevalence of anaemia, WHO Vitamin and Mineral Nutrition Information System, 1993–2005,‖ Public Health Nutrition, vol. 12, no. 4, pp. 444–454, 2009.

Ekwere, T. A., Ino-Ekanem, M. B., & Motilewa, O. O. 2015. Indications and Spectrum of Haematological Disorders from Bone Marrow Aspiration Examination: A Three-Year Review Study. *Global Journal of Hematology and Blood Transfusion*, *2*(1), 4-8.

Etheredge, A. J., Premji, Z., Gunaratna, N. S., Abioye, A. I., Aboud, S., Duggan, C., & Hamer, D. H. 2015. Iron supplementation in iron-replete and nonanemic pregnant women in Tanzania: a randomized clinical trial. *JAMA pediatrics*, *169*(10), 947-955.

Gebreamlak, B., Dadi, A. F., & Atnafu, A. 2017. High adherence to iron/folic acid supplementation during pregnancy time among antenatal and postnatal care attendant mothers

in Governmental Health Centers in Akaki Kality Sub City, Addis Ababa, Ethiopia: Hierarchical negative binomial poisson regression. *PLoS ONE*, *12*(1), 1–11. doi: 10.1371/journal.pone.0169415

Ghana News Agency: Anaemia recording high prevalence rate in children and pregnant women; 2009. http://www.modernghana.com/news/240408/

Ghana Statistical Service (GSS), Ghana Health Services (GHS), ICF Macro: Ghana Demographic and Health Survey 2008. Accra.

Ghose, B., & Yaya, S. 2018. Fruit and vegetable consumption and anemia among adult nonpregnant women: Ghana Demographic and Health Survey. *Peer*, *6*, e4414.

Habtewold, T. D., Mohammed, S. H., Endalamaw, A., Akibu, M., Sharew, N. T., Alemu, Y. M., ... & Tegegne, B. S. 2018. Breast and complementary feeding in Ethiopia: new national evidence from systematic review and meta-analyses of studies in the past 10 years. *European journal of nutrition*, 1-31

Hisano, M., Suzuki, R., Sago, H., Murashima, A., & Yamaguchi, K. 2010. Vitamin B6 deficiency and anemia in pregnancy. *European journal of clinical nutrition*, *64*(2), 221.

Ikeanyi, E. M., & Ibrahim, A. I. 2015. Does antenatal care attendance prevent anemia in pregnancy at term. *Nigerian journal of clinical practice*, *18*(3), 323-327.

Jensen, R. R., & Shumway, J. M. 2010. Sampling our world. *Research Methods in Geography: A Critical Introduction*, *6*, 77.

Krishnasivam, D., Trentino, K. M., Burrows, S., Farmer, S. L., Picardo, S., Leahy, M. F., ... & Waterer, G. 2018. Anemia in hospitalized patients: an overlooked risk in medical care. *Transfusion*, *58*(11), 2522-2528.

Lumor, O. 2017. _Factors Influencing the Use of Anemia Preventing Measures Among Antenatal Clinic Attendants in the Kintampo North Municipality', (November). Available at: http://ugspace.ug.edu.gh.

Lumor, O., Dzabeng, F., & Adanu, R. M. 2019. Factors influencing the use of anemia preventing measures among antenatal clinic attendees in the Kintampo North Municipality, Ghana. *African journal of reproductive health*, *23*(2), 35-43.

Ministry of Health and Family Welfare 2009. Annual Report 2008–09., Government of India. p.73

Missagia, S. V., Oliveira, S. R., & Rezende, D. C. 2013. Beauty and the beast: gender differences in food-related behavior. *Revista Brasileira de Marketing*, *12*(1), 149-165.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. 2017. Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*(1), 1609406917733847.

Onyeneho, N. G., & Igweonu, O. U. 2016. Anaemia is typical of pregnancies: capturing community perception and management of anaemia in pregnancy in Anambra State, Nigeria. *Journal of Health, Population and Nutrition*, *35*(1), 29.

Patience, D. I. C. K. S. O. N. 2016. *Knowledge and Perception of Risk of Anaemia During Pregnancy among Pregnant Women in Ablekuma South* (Doctoral dissertation, University of Ghana).

Polit, D. F., & Beck, C. T. 2010. Generalization in quantitative and qualitative research:

Myths and strategies. *International journal of nursing studies*, *47*(11), 1451-1458.

Pringle, J. and Seal, A. 2013. _Anaemia Strategy Review 1 | 1 4 0 UNHCR Anaemia Strategy Review', (May), pp. 1–151. Available at: https://www.unhcr.org /5669540d9.pdf.

Queiroz, L. P. 2013. Worldwide epidemiology of fibromyalgia. *Current pain and headache reports*, *17*(8), 356.

Ravi U, Palanivel C and Vaman K 2012. Unrelenting burden of anaemia in India: Highlighting possible prevention strategies. *International Journal of Collaborative Research on Internal Medicine and Public Health*

Sargeant, J. 2012. Qualitative research part II: Participants, analysis, and quality assurance.

Stoltzfus, Rebecca J., Luke Mullany, and Robert E. Black 2004. ―Iron Deficiency Anaemia.‖ Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors 1: 163–209

Ter Kuile, F. O., Terlouw, D. J., Phillips-Howard, P. A., Hawley, W. A., Friedman, J. F., Kariuki, S. K., ... & Nahlen, B. L. 2003. Reduction of malaria during pregnancy by permethrin-treated bed nets in an area of intense perennial malaria transmission in western Kenya. *The American journal of tropical medicine and hygiene*, *68*(4_suppl), 50-60.

White KC 2005. Anemia is a poor predictor of iron deficiency among toddlers in the United States: For heme the bell tolls. Pediatrics 2005; 115:315-20

WHO and UNICEF 2004. Focusing on Anaemia: Towards an Integrated Approach for Effective Anaemia Control. Integrated Approach for Effective Anaemia Control. Geneva, Switzerland.

WHO/UNICEF/UNU. Iron deficiency anaemia: assessment, prevention, and control. Geneva, World Health Organization, 2001. (WHO/NHD/01.3)

World Health Organization 1992. The prevalence of anaemia in women: A tabulation of available information. Geneva, Switzerland.

World Health Organization 2001. Reducing Risks, Promoting Healthy Life, The World health report. Geneva, Switzerland.

World Health Organization. 2015. The global prevalence of anaemia in 2011.

World Health Organization. 2016. Strategies to prevent anaemia: recommendations from an expert group consultation, New Delhi, India, 5-6 December 2016.

Ziegelbauer, K., Speich, B., Mäusezahl, D., Bos, R., Keiser, J., & Utzinger, J. 2012. Effect of sanitation on soil-transmitted helminth infection: systematic review and meta-analysis. *PLoS medicine*, *9*(1), e1001162.

Zingani, E., Kalungia, G. M. C., Mukosha, M., & Banda, A. 2017. Journal of Preventive and Rehabilitative Medicine. *Medicine*, *1*(1), 25-33.

APPENDIX'S 1

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE

FACTORS INFLUENCING THE USE OF ANAEMIA PREVENTION STRATEGIES AMONG WOMEN ATTENDING ANTENATAL CLINIC IN THE BUNKPURUGU - NAKPANDURI DISTRICT.

Introduction

Dear respondent, this questionnaire is part of a research work in partial fulfilment of the requirements for the award of Master of Public Health in Population and Reproduction Health. I am conducting a local survey that asks respondents about various factors influencing the use of anaemia prevention strategies among antenatal clinic attendants in the Bunkpurugu - Nakpanduri District. In view of this, I will be asking you questions on your demographic characteristics. I would appreciate your participation in this survey. The survey usually takes 10 and 15 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to anyone other than members on our survey team. Participation in this survey is voluntary and if we should come to any question you do not want to answer, just let me know and I will go on to the next question, you can also stop the interview at any time when the need arises. However, we hope that you will participate in this survey since your views are important. The data collected shall be assured of confidentiality and it shall be used purposely for the study.

Section A: Demographic Characteristics of Respondents

1. Age (years) ……
2. Marital status a) Single [ ] b) Married [ ] c) Divorced [ ] d) Widowed [ ] e) Separated [ ]
3. What is your ethnic group? a) Bimoba [ ] b) Komba [ ] c) Mamprusi [ ] e) Others
4. Highest level of education a) None [ ] b) Basic [ ] c) Secondary [ ] d) Tertiary [ ]
5. Religion a) Christianity [ ] b) Islam [ ] c) Traditional [ ] d) Others [ ]
6. Occupation a) Petty Trading [ ] b) Civil servant [ ] c) Seamstress [ ] d) Hairdresser [ ] e) Unemployed [ ] f) Others [ ]

7. Average monthly income a) Ghc 50-Ghc100 [ ] b) Ghc100-Ghc150 [ ] c) Ghc150-Ghc 200 [ ] d) Other [ ]

Section B: Knowledge on anaemia

These are the strategies in prevention anemia. Kindly indicate your level of knowledge regarding these strategies. Indicate very poor as your least knowledge and very good as your highest level of knowledge. **VP=Very poor, P=Poor, M=Moderate, G=Good, VG=Very Good**

	Anaemia prevention strategies	**VP**	**P**	**M**	**G**	**VG**
8.	Use of insecticide treated net (ITNs)					
9.	Iron supplements to the infant					
10.	Food mix with nutrients					
11.	Breast feeding alongside others foods					
12.	Provision of breast milk to the infant					
13.	Improvement in nutrition of the infant					

14. Identify your source of knowledge about the prevention strategies

a) Health worker [ ] b) Friend [ ] c) Relative [ ] d) Radio [ ] e) School [ ] f) Other [ ]

Section C: Use of anaemia prevention strategies

15. Have you ever used any of the anaemia prevention strategies?

a) Yes b) No

16. Which of the prevention strategies did you use? Multiple ticking allowed.

Used strategies	Yes	No
Use of ITNs		
Fortified foods		
Iron Supplements		
Breast milk		
Breast feeding alongside other foods		
Nutritional improvement		

17. When did you use the chosen strategy?

a) Before anaemia [ ] b) After anaemia [ ]

18. Did the strategy help you to prevent anaemia?

a) Yes b) No

Section D: Health related factors that influence the use of anaemia prevention strategies

19. Have you experienced any health-related factor while using the anaemia prevention strategy? a) Yes [ ] b) No [ ]

If yes in **Q19, tick the answer that really reflects your situation**

No	Health related factors	Yes	No
20	The attitude of health workers encouraged me to use anaemia prevention strategies		
21	The distance of the health facility discouraged me from seeking drugs to treat my child‘s anaemia		
22	The health facility did not have anaemia drugs when I requested		
23	There were availability of anaemia prevention strategies at the health facility		

Availability of interventions at health facilities (from question 24-27 ask unit in-charge)

24. Iron supplements a) Yes [ ] b) No [ ]

25. Antihelminthics a) Yes [ ] b) No [ ]

26. Sulphadoxine pyrimethamine a) Yes [ ] b) No [ ]

27. Insecticide Treated Nets a) Yes [ ] b) No [ ]

Section E: Socio cultural factors that influence the use of anaemia prevention strategies 28. Does your society have strong foods taboos? a) Yes [ ] b) No [ ]

29. Do your cultural values negatively affect the use of anaemia prevention strategies? a) Yes [ ] b) No [ ]

30. If yes in **Q29**, do you abide by these taboos? a) Yes [ ] b) No [ ]

31. Do the taboos affect you in using any of the anaemia prevention strategies?

a) Yes b) No

32. Do your social values allow you to assess anaemia prevention strategies? a) Yes [ ] b) No [ ]

33. Does your level of income influence your utilization of anaemia prevention strategies?

a) Yes b) No

34. Does the work you do influence use of anaemia prevention strategies?

a) Yes b) No

35. Does your social status level influence the use of anaemia prevention strategies?

a) Yes b) No

APPENDIX'S 2

Participant Information Leaflet and Consent Form

<u>This leaflet must be given to all prospective participants to enable them know enough about the research before deciding to or not to participate</u>

Title of Research:

(Factors influencing the use of anaemia prevention strategies among pregnant women attending antenatal clinic in the Bunkpurugu - Nakpanduri District)

Name(s) and affiliation(s) of researcher(s):

This study is being conducted by, Mr Bunbom Moses Miibot of Kwame Nkrumah University of Science and Technology, Kumasi.

Background (Anaemia has become a matter of urgency to health professional all over the world. It has become a global public health issue bothering the developed and developing countries with major consequences for human health as well as social and economic development and also my district as well. In view of this, I want to study the factors influencing the use of anaemia prevention strategies among pregnant women attending ANC.**):**

Purpose(s) of research:

(The purpose of the study is to determine the factors influencing the use of anaemia prevention strategies among pregnant women attending ANC.)

Procedure of the research, what shall be required of each participant and approximate total number of participants that would be involved in the research:

(I will use sampling techniques which include random and convenience sampling techniques which mean both probability and non-probability sampling techniques will be used for the study. In total, I will expect to recruit 360 participants into this study throughout the district.)

Benefit(s):

(The goal of this research is to find out the factors influencing the use of anaemia prevention strategies among pregnant women attending ANC.) **Confidentiality:**
(All information collected in this study will be given code numbers. No name will be recorded. Data collected cannot be linked to you in anyway. No name or identifier will be used in any publication or reports from this study **Voluntariness:**
(Taking part in this study should be out of your own free will. You are not under obligation to. Research is entirely voluntary.)

Alternatives to participation:
(If you choose not to participate, this will not affect your treatment in this hospital/facility in any way.)

Withdrawal from the research:
(You may also choose not to answer any question you find uncomfortable or private).

Consequence of Withdrawal: (There will be no consequence, loss of benefit or care to you if you choose to withdraw from the study. Please note however, that some of the information that may have been obtained from you without identifiers (name etc), before you chose to withdraw, may have been modified or used in analysis reports and publications.)
Costs/Compensation: (For your time/inconvenience, I will compensate you with one soft drink and one biscuit to show my appreciation for your participation).

Contacts: (If you have any question concerning this study, please do not hesitate to contact Mr Bunbom Moses Miibot (Name of Researcher or PI) on 0245250137).

Further, if you have any concern about the conduct of this study, your welfare or your rights as a research participant, you may contact:

The Office of the Chairman
Committee on Human Research and Publication Ethics
Kumasi
Tel: 0322063248 or 0205453785

APPENDIX'S 3

CONSENT FORM

Statement of person obtaining informed consent:

I have fully explained this research to _____ and have given sufficient information about the study, including that on procedures, risks and benefits, to enable the prospective participant make an informed decision to or not to participate.

DATE: _____ NAME: _____

Statement of person giving consent:

I have read the information on this study/research or have had it translated into a language I understand. I have also talked it over with the interviewer to my satisfaction.

I understand that my participation is voluntary (not compulsory).

I know enough about the purpose, methods, risks and benefits of the research study to decide that I want to take part in it.

I understand that I may freely stop being part of this study at any time without having to explain myself.

I have received a copy of this information leaflet and consent form to keep for myself.

NAME:_____

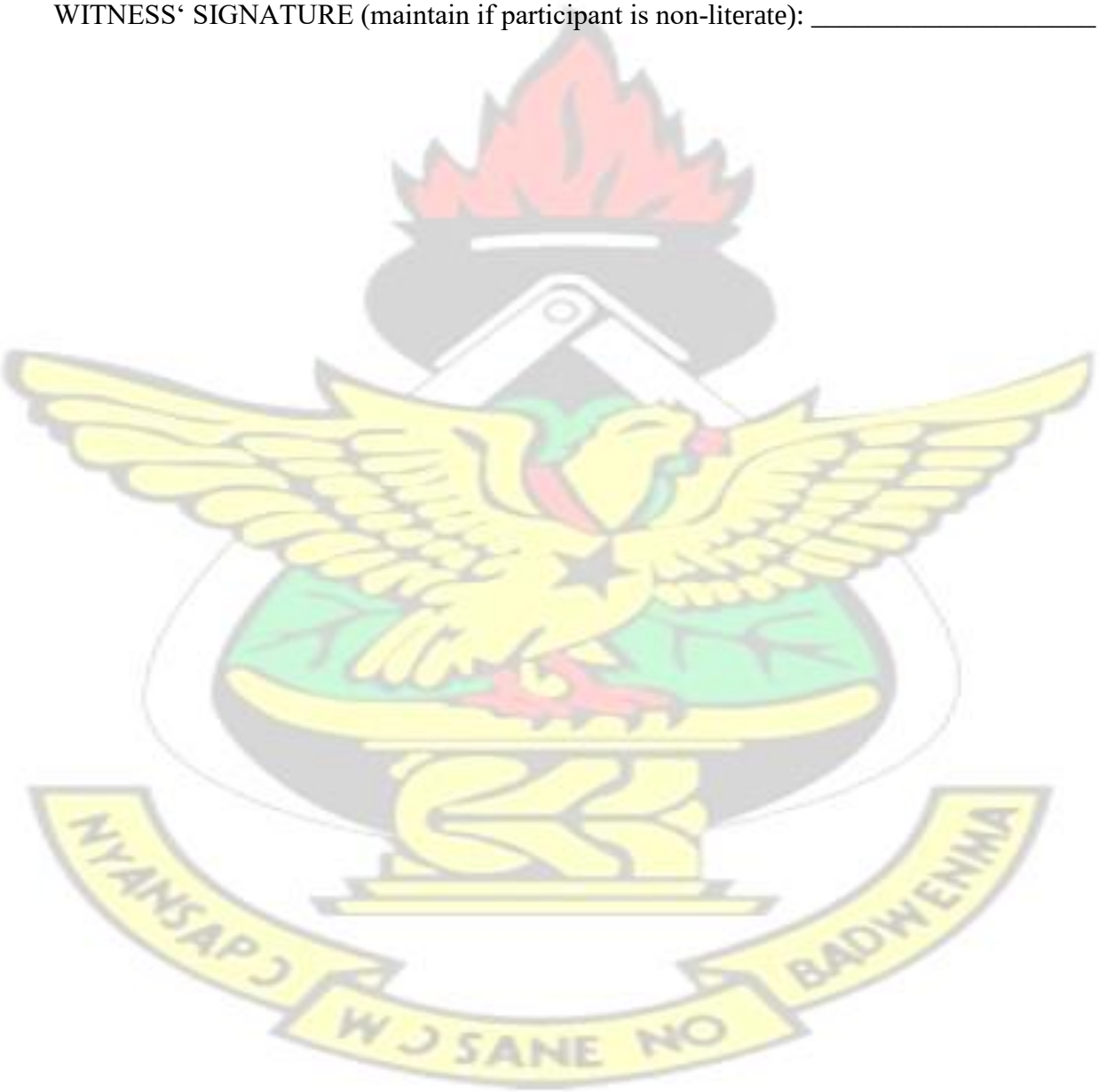
DATE: _____ SIGNATURE/THUMB PRINT: _____

Statement of person witnessing consent (Process for Non-Literate Participants):

I _____ (Name of Witness) certify that information given to

_____ (Name of Participant), in the local language, is a true reflection of what l have read from the study Participant Information Leaflet, attached.

WITNESS‘ SIGNATURE (maintain if participant is non-literate): _____



APPENDIX 4

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL
COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS

Our Ref: CHRPE/AP/339/19 27th May, 2019.

Mr. Bunkum Moses Milbor
Department of Population, Family
and Reproductive Health
School of Public Health
KNUST-KUMASI.

Dear Sir,

LETTER OF APPROVAL

Protocol Title: *"Factors Influencing the Use of Anemia Prevention Strategies Among Pregnant Women Attending Antenatal Clinic in the Bunkpurugu - Nakpandori District"*

Proposed Site: *Health Facilities, Bunkpurugu Nakpandori District.*

Sponsor: *Principal Investigator.*

Your submission to the Committee on Human Research, Publications and Ethics on the above-named protocol refers.

The Committee reviewed the following documents:

- A certification letter 3rd April, 2019 from the District Health Directorate, Bunkpurugu (study site) indicating approval for the conduct of the study at the District.
- A Completed CHRPE Application Form.
- Participant Information Leaflet and Consent Form.
- Research Protocol.
- Questionnaire.

The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, beginning 27th May, 2019 to 26th May, 2020 renewable thereafter. The Committee may however suspend or withdraw ethical approval at any time if your study is found to contravene the approved protocol.

Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.

The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.

Yours faithfully,

Osomfo Prof. Sir J. W. Ackumpong, MD, FWACP
Chairman

Room 7 Block L, School of Medical Sciences, KNUST, University Post Office, Kumasi, Ghana
Phone: 1233 (0)3220 63278 Mobile: +233 20 5463785 Email: chrpe.knust.kath@gmail.com / chrpe@knust.edu.gh

APPENDIX 5

GHANA HEALTH SERVICE

OUR CORE VALUES
1. People-Centered
2. Professionalism
3. Team Work
4. Innovation
5. Discipline
6. Integrity

MY REF NO: GHS/NR/BYD/ 108

YOUR REF NO: .....

DIST HEALTH DIRECTORATE
P.O. BOX NK 24
BUNKPURUGU

3rd April, 2019

PERMISSION TO CONDUCT RESEARCH WORK AT THE HEALTH FACILITIES IN THE DISTRICT

I write to inform you that permission has been granted for the student to conduct his research work at the health facilities to facilitate the award of his certificate as required by your Institution.

Management will avail itself in whatever way possible to assist the student conduct his research work successfully.

Thank you.

ALIDU ALHASSAN
ADMINISTRATIVE MANAFER
For DIST. DIR. HEALTH SERVICES

ETHICAL COMMITTEE
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
KUMASI