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THE INFLUENCE OF MATERNAL EDUCATION ON ANTENATAL CARE ATTENDANCE AT THE OLD TAFO GOVERNMENT HOSPITAL

BY

ADU EMMANUEL KWADWO

(10353216)

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DECLARATION

I do hereby declare that apart from people‟s knowledge that have been duly acknowledged, this thesis is the result of my hard work under competent supervision.

I take full responsibility for any shortcomings in this work.

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ADU EMMANUEL KWADWO DATE ……

(Student)

…… DATE ……

DR. SETH KWAKU AFAGBEDZI

(Supervisor)

DEDICATION

This research work is dedicated to my beloved late mother, aunt and friend Madam Felicia Nana Akyaa. Words alone cannot describe the love we shared.

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ABSTRACT

Introduction: Worldwide, it was approximated that 303,000 maternal deaths will occur in 2015, yielding a general MMR of 216 maternal deaths per 100 000 live births for the 183 nations. Sub-Saharan Africa has an elevated MMR with a point-gauge of 546 per 100,000. In Ghana the MMR was 319 per 100,000 in 2015. Antenatal care exists as one of the Safe Motherhood intercessions that when executed effectively has the possibility to remarkably minimize deaths before and few weeks after delivery. The number of ANC visits per client reduced from 6.3 to 5.6 in 2015 at the Old Tafo Government Hospital. The general objective of the study was to find the factors the influence ANC attendance at the Old Tafo Government Hospital.

Methods: A cross-sectional study design and quantitative approach was used to collect the data. Proportion of number of ANC attendance was derived. Association between maternal formal education and number of ANC visits was assessed using the bivariate analysis. Logistic regression was used to determine the strength of association between maternal education and ANC attendance. All tests were two-tailed and statistical significance was set at 0.05.

Results: the proportion of 8 or more ANC visits was found to be 7.51%. Out of the women who attended the recommended number of ANC, 77.5% had secondary and tertiary education and 67.7% were married. Maternal formal education had no significant association with ANC attendance at the Old Tafo Government Hospital.

Conclusion: Attending the recommended number of ANC visits before delivery among women was low at the Old Tafo Government Hospital. And maternal formal education has no significant association with ANC attendance.

Recommendation: Increasing awareness of the public on the relevance of early initiation, and having completed the recommended ANC visits, should be a major priority.

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
DHIMS	District Health Information Management System
FANC	Focused Antenatal Care
LMICs	Low and Middle-Income Countries
MMR	Maternal Mortality Ratio
SDG	Sustainable Development Goal
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children‟s Emergency Fund
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.0 Background to the study

Globally, approximately 800 women died from pregnancy and labor related complexities every day in 2013 (Amoah, Anto, Osei, Pieterson, & Crimi, 2016). Low-income countries accounted 99 % of these mortalities, with sub-Saharan Africa region alone representing 62 % (Amoah et al., 2016). In Ghana, maternal mortality ratio (MMR) declined by an estimation of 40% between 1990 and 2010, although, at a rather slow rate (Aryeetey, Aikins, Adongo, & Dako-Gyeke, 2015). By and by, the nation is still ordered among the 40 nations with the most elevated MMR, around the world (Aryeetey et al., 2015). In the year 2008, 451 maternal mortalities were documented for each 100,000 live births in Ghana; this represented a decrease from 740 in 1990 (Aryeetey et al., 2015). In 2013, MMR reduced to approximately 380 (per 100,000 live births), a number which was still far over the 185 targeted in Millennium Development Goal (MDG) Five (Amoah et al., 2016). In spite of the advances made, Ghana did not accomplish the MDG Five (Dickson, Kofuor, Darteh, & Kyereme, 2017).

Research has demonstrated that the antenatal session provides chances to getting to gestational women with various interventions, for example, Antenatal Care (ANC) that might be imperative to the wellbeing of the mother and her unborn infant and at last decrease MMR (Dickson et al., 2017).

Antenatal care (ANC) - is characterized as “care before birth”, and includes education, counseling, screening and treatment to monitor and to promote the well-being of the mother and baby (Arthur, 2012). Antenatal care provides preventive interventions and information, which are important for detecting and managing complications during pregnancy and childbirth (Kabir, 2012). ANC aims to provide regular medical and nursing care during pregnancy by the medical

health care providers (Kabir, 2012). In addition, ANC sets up contact with pregnant ladies to identify and oversee current medical issues (Amoah et al., 2016). It includes providing health information about pregnancy complications and dangerous signs, symptoms and risks of labor and delivery, importance of seeking medical care and deliver with the assistance of skilled health care provider, among others (Kabir, 2012).

In addition, reduction of adverse health outcomes like preterm birth, children born weighing less than 2.5kg (low birth weight) and little for gestational age (infant born with a birth weight less than the 10^{th} percentile) have been linked with ANC (Kabir, 2012). The latest WHO ANC model prescribes at least eight ANC visits, with the first visit planned to happen in the first 3 months (up to 12 weeks of incubation), two visits planned for the second 3 months (at 20 and 26 weeks of growth) and five visits planned for the third trimester (at 30, 34, 36, 38 and 40 weeks of development) (WHO, 2016).

In sub– Saharan Africa, gestational women who attend at least four antenatal care visits changed from 12% in Ethiopia; 35% in Rwanda, 47% in Kenya, 62% in Cameroon to 87% in Ghana (Dickson et al., 2017). Research demonstrates that most (96%) of gestation Ghanaian ladies get antenatal care (ANC) from a trained provider, be that as it may, near a fourth of pregnant women do not use ANC administrations for the minimum prescriptions during gestation (Aryeetey et al., 2015). As indicated by the Ghana Demographic and Health Survey (2014) about 1.2% of pregnant women did not use ANC benefits in the Ashanti Region (GSS, 2014). In Kumasi, approximately 1.1% women did not attend ANC during pregnancy (Asundep et al., 2013). Which means that some pregnant ladies are not profiting from the services offered during this peroid (Cooper, Regan, & Muyunda, 2016), which incorporates treatment of pregnancy-prompted hypertension, immunization against tetanus, disease prevention and micronutrient supplementation (Asundep et al., 2013).

Evidence from a previous study done in Kumasi suggested that cost, number of children and distance of the health facility impact ANC participation and are related with unfriendly pregnancy results (Asundep et al., 2013). Research has demonstrated a positive relationship between mothers‟ long stretches of formal education and utilization of maternal and kid wellbeing services (Greenway, Leon, & Baker, 2013).

A study has demonstrated that women's formal education can give the learning to request and look for appropriate healthcare services imperative to discredit difficulties (Kabir, 2012). Mothers with formal education can read daily papers, pennants, leaflets and announcements and can better appreciate wellbeing messages every one of which give them chances to extend wellbeing information (Greenway et al., 2013). According to a worldwide survey study, maternal mortality rate tend to be higher in countries where female illetracy rate is higher than their male counterparts (Kabir, 2012).

According to the Ghana Statistical Service (2014), there are more female illetrates in Kumasi than their male partners; among the males, 5.5% has never had formal education, 43.2% were not in school and 51.5% have been to school before, though among the women, moderately high rate (12.4%) are illetrates, 38% percent were in school and 49.6% have gone to school previously.

1.1 Problem statement

In Ghana, maternal mortality is the second biggest cause of female deaths, and records for 14% of every single female death (Ganle, Parker, Fitzpatrick, & Otupiri, 2014). Most maternal and child mortalities can be forestalled through preventive care or early and effective restorative treatment from a skilled specialist at the appropriate time (Greenway et al., 2013). Research has demonstrated that use of maternal and child wellbeing services are key in reducing MMR

(Greenway et al., 2013). Despite the fact that there is an expansion in the accessibility of wellbeing services in Ghana, utilization of maternal and child wellbeing services stays at low levels (Greenway et al., 2013). Therefore, it is appropriate to look at the fundamental causes of low maternal and child health utilization and work on these issues more. Emphasis should be given to women's education as educated women understand the importance of seeking health care services during pregnancy period (Kabir, 2012)

According to the DHIMS 2 report (unpublished), the average number of ANC visits per client reduced from 6.3 to 5.6 in 2015 at the Old Tafo Government Hospital. Also, the number of pregnant women who attended ANC at the Old Tafo Government Hospital reduced from 13,428 in the year 2014 to 12,290 in the year 2015 (8.5 percent reduction) according to the DHIMS 2, (unpublished) in 2017.

Studies have shown many factors that influence ANC attendance in Ghana (Pell et al., 2013; (Asundep et al., 2013). Maternal level of formal education is a standout amongst the most as often as possible discovered variables that impact the utilization of maternal and child health services (Greenway et al., 2013). But there is currently limited evidence on the relationship between maternal level of education and ANC attendance in Old Tafo and Kumasi as a whole. The current study seek to find the influence of maternal education on ANC attendance at the Old Tafo Government Hospital.

1.2 Justification of the Study

This study seeks to provide evidence-based research into the influence of maternal education on ANC visits among pregnant women. This study will not only contribute to the existing body of knowledge on maternal education and other factors associated with number of ANC participation all in all. Mothers‟ long periods of formal education is a standout amongst the most much of the

time discovered determinants of utilization of maternal and child health services (Greenway et al., 2013). In Ghana, about a fourth of elementary school-matured young women stay out of primary school, policymakers refer to low levels of women's formal education as a foremost purpose behind the absence of change in maternal and child health (United Nations, 2010).

This study therefore hopes to provide relevant insight in the influence of maternal education on ANC utilization in Old Tafo. Understanding the relationship between maternal formal education and utilization of wellbeing services may advise instructive projects that can enhance maternal and child wellbeing outside of the formal school setting in Old Tafo and Kumasi as a whole. This research may give challenges looked by the ANC attendance and recommend approaches to solve them.

1.3 Objectives

To determine the influence of maternal education on ANC attendance among pregnant women who attend ANC at Old Tafo Government Hospital.

1.3.1 Specific objective

1. To determine the proportion of women assessing ANC services per the WHO recommendation (8+).

2. To determine association between mothers formal education and ANC attendance.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Antenatal care is observed to be a requirement for every pregnant woman and the newborn baby. The basis of this section is to review relevant literature related to the research topic. This chapter explored a wide range of literature on various variables that are identified to have effect on ANC attendance.

2.1 Maternal health

In medical terminologies, maternal health alludes to the wellbeing of female amid gestation, labor, and after delivery. Three unique kinds of markers have generally been utilized to portray maternal health. These include; maternal deaths, ill-health for chosen sicknesses, and dietary related issues amid gestation (Banda, 2015).

Maternal mortality ratio (MMR) is communicated as the number of maternal deaths per 100,000 live births. Maternal mortality still remains as one of the major challenges in many developing countries though significant progress has been made to alter the trend (Banda, Michelo, & Hazemba, 2012). Extraordinary contrasts in MMR happen amongst developed and developing nations, with dominant part happening in developing nations (Kabir, 2012). There were about 287,000 maternal deaths in 2010 globally at a rate of around 210 deaths per 100,000 live births. Though MMR declined from 400 to 210 per 100,000 live births between 1990 and 2010, the figure remained high (Kabir, 2012). There was a gauge of 303 000 maternal deaths worldwide in the year 2015, leading to a general MMR of 216 per 100,000 for 183 nations (WHO/UNICEF/UNFPA, 2014). The general MMR in less developed locales is 239, which is around 20 times higher than that of developed areas, where it is just 12. Sub-Saharan Africa has a high MMR with a point-gauge of 546. Three regions – Oceania (187), Southern Asia (176) and

South-eastern Asia (110) – have moderate MMR. The remaining five regions have low MMR (WHO/UNICEF/UNFPA, 2014).

The lifetime peril of maternal mortality is evaluated at 1 of every 36 in sub-Saharan Africa, around 1 of every 4900 in developed nations. Developed areas with the most reduced lifetime hazard are Eastern Asia (1 of every 2300) and Caucasus and Central Asia (1 in 1100) (WHO et al., 2014).

Table 2.1. Assessments of maternal mortality proportion (MMR, maternal deaths per 100 000 live births), number of maternal deaths, and lifetime risk, by United Nations Millennium Development Goal (MDG) locale, 2015

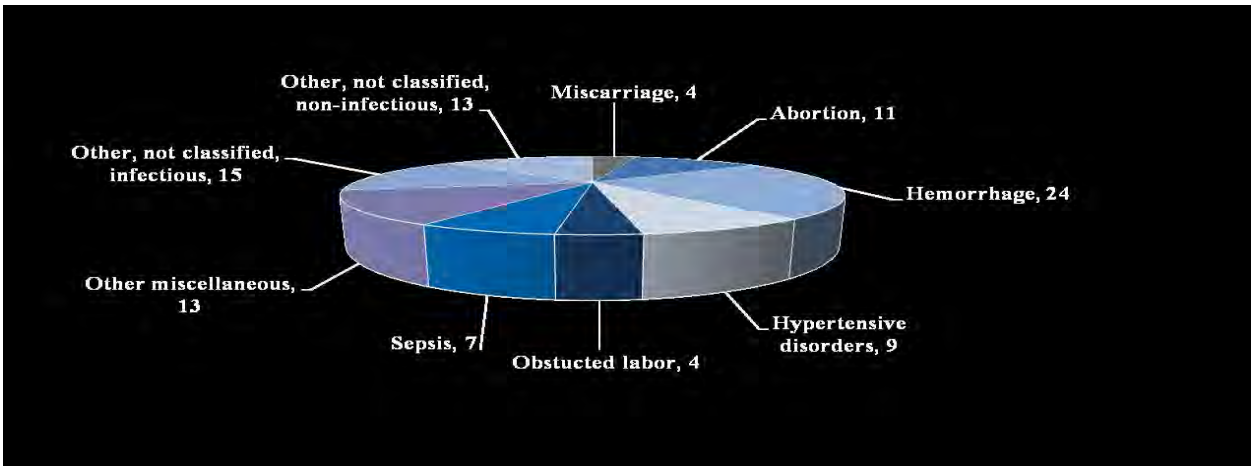
MDG region (in bold)	MMR	Number of maternal deaths	Lifetime risk of maternal death 1 in
World	216	303,000	180
Developed countries	12	1700	4900
Developing countries	239	302 000	150
Northern Africa	70	3100	450
Sub-sahara Africa	546	201000	36
Eastern Asia	27	4800	2300
Eastern Asia excluding china	43	378	1500
Southern Asia	176	66000	210
Southern Asia excluding India	180	21000	190
South-eastern Asia	110	13000	380
Western Asia	91	4700	360
Caucasus and Central Asia	33	610	1100
Latin America and the Caribbean	67	7300	670
Latin America	60	6600	670
Caribbean	175	1300	250
Oceania	187	500	150

(WHO et al., 2014)

Maternal mortality is characterized as the demise of a lady while in the gestation period or inside forty-two days of fetus removal, independent of the span and site of the gestation, from any reason associated with or irritated by the pregnancy or its management yet not from inadvertent causes (Banda, 2015).

Maternal mortality could occur from immediate or roundabout sources. Direct obstetric complications like obstetric hemorrhage, infections, eclampsia, prolonged or obstructed labour and dangerous abortion followed by indirect causes like anemia, malaria and HIV worsen the hemorrhagic condition further (Kabir, 2012). Nonetheless, the vast majority of these maternal mortalities and wounds are caused by natural procedures not from ailments which can be anticipated and has to a great extent been eliminated in the developed globe. Hemorrhage is one of those natural procedures, and records for 24% of maternal deaths worldwide. Sepsis, indirect causes (malaria, anemia), unsafe abortion, obstructed labour, eclampsia and other direct causes represents over a 50% of all maternal mortality. Lack of proper obstetric care in poor areas, low use of both antenatal and postnatal care and also low scope of births attended to by health personnel additionally increase the MMR (Banda, 2015) .

Figure 2.1: Worldwide distribution of causes of maternal mortality

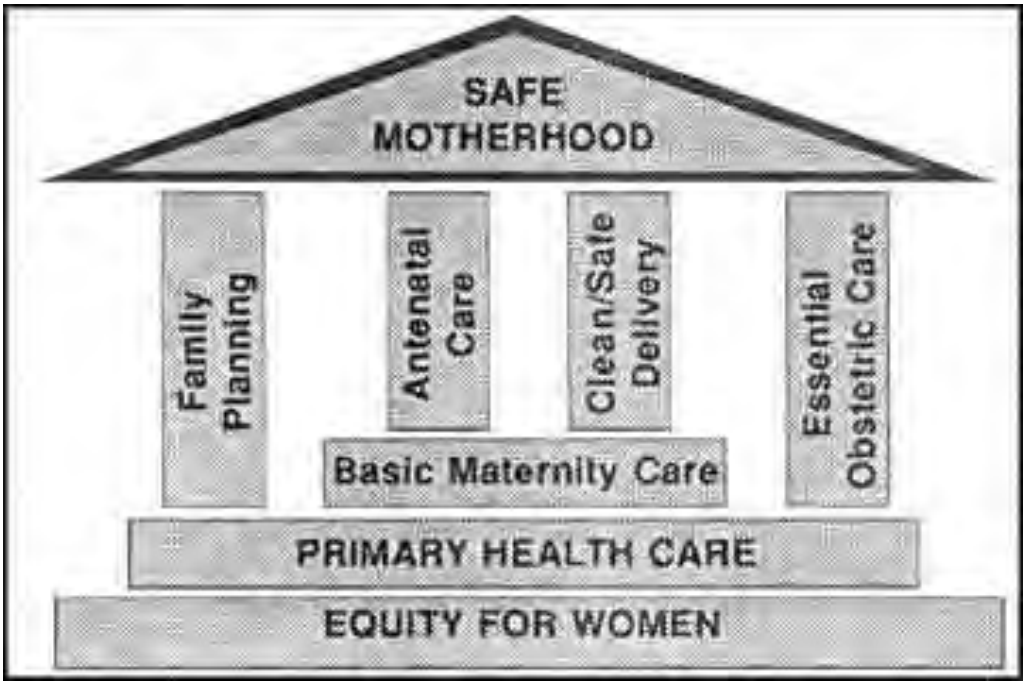


(Asare, 2010).

Ghana's MMR was assessed to have declined by around half in between 1990 and 2015 (from 634 to 319) (Melorose et al., 2015), but, at a rate slower than the MDG recommendation (to reduced MMR by 75% by 2015) (Biritwum, 2006) . The greater part of the factors identified with maternal deaths are preventable and it has additional cost to the general public and the wellbeing of the infant should the infant survive (Biritwum, 2006). Governments worldwide have put in measures to take care of the issue of maternal deaths through the definition and execution of strategies, enactments and services.

In 1987, the WHO and other UNs' offices like UNICEF propelled the Safe Motherhood Initiative in Nairobi (Biritwum, 2006). The main purpose was to guarantee that most pregnancies and deliveries were taken care of securely both at the community and health facility level in a demonstration to decrease deaths of mothers by 70% from 1990 to 2015 (Banda, 2015). Safe parenthood contains a series of activities, practices, conventions and service delivery rules intended to guarantee that women get great gynecological care, family planning, pre-birth, delivery and postpartum care(Banda, 2015). The four mainstays of safe parenthood are family planning, ANC, clean/safe birth delivery and fundamental obstetric care. It is basic to execute Safe motherhood in a vertical and incorporated way and frame some portion of a wide procedure to enhance regenerative wellbeing through primary health care as showed in the Figure 2.2. Subsequently all interventions ought to be executed within the universal setting that elevates equity in access to standard care by all ladies in conceptive age (Banda, 2015).

Figure 2.2: The four mainstays of safe motherhood



Adopted from WHO, 1996

2.2 ANTENATAL CARE

Antenatal care (ANC) can be defined as the guidance given by skilled health-care services experts to pregnant women and adolescent so as to guarantee the optimum wellbeing conditions for both the woman and the child amid gestation (WHO, 2016). Furthermore, ANC could be explained as "care before birth", and incorporates schooling, counselling, surveillance and treatment to monitor and to advance the health of the mother and fetus" (Kabir, 2012). The ANC programme was designed in Europe in the early twentieth century and was initially centered around women in socially deprived conditions, with the aim of improving maternal and prenatal results (Al-Ateeq & Al-Rusaiess, 2015). Cautiously, ANC was extended to incorporate more particular screening methods to identify defined medical conditions for every single pregnant women (Al-Ateeq & Al-Rusaiess, 2015). The constituent of ANC comprise: identifying risk;

preventing and managing pregnancy-related or comorbidity; and education on health and also health promotion (WHO, 2016).

Antenatal care provides actions taken to reduce the risk for diseases and information which are significant to identify and manage difficulties during pregnancy and childbirth (Kabir, 2012). ANC provides counseling and information to women about suitable place of delivery, depending on the state and status of the woman (Banda, 2015). Additionally, ANC minimizes maternal and perinatal sickness and deaths specifically, through detection and provision of remedy of complications identified with pregnancy, and in a roundabout way, through the recognizable proof of women and young ladies at high danger of developing complications amid labor and childbirth, therefore ensuring referral to a legitimate level of care (WHO, 2016). ANC focuses on giving regular medical and nursing care during pregnancy by the medically trained health care providers. It involves providing health information about pregnancy complications and life threatening signs, symptoms and risks for labour and delivery, importance of seeking medical care and deliver with the assistance of skilled health care provider, among others (Kabir, 2012). More so, ANC could help in reducing the gravity of gestation related difficulties through surveillance and early treatment of conditions which are escalated during pregnancy, such as gestational hypertension, malaria, and anemia which endanger the life of both mother and fetus (Banda, 2015).

ANC has been considered a fundamental element of any propagative health care mapped out (Banda, 2015). The frequency of utilization of ANC differs severely from one country to another. These are because of determinants such as socio-cultural, historical, traditional nature as well as financial status of the particular country. Moreover, human and financial resources of a particular health system play a role in developing the frequency of ANC utilization (Banda, 2015). In the USA and in numerous nations of Western Europe, gestation ladies go to ANC 12-

16 times in the course of gestation and within 42 days after delivery (Vermaak, 2015). Larger part of developed nations utilize customary model of ANC which depends on higher number of visits, around 7-10 visits. They comprise, month to month visits up to 28 weeks, trailed by week by week up to 36 weeks until childbirth (Banda, 2015). In India pregnant woman needs 3 or more ANC visits and in France 7 visits for pregnancies with no complications (Ntui et al., 2016).

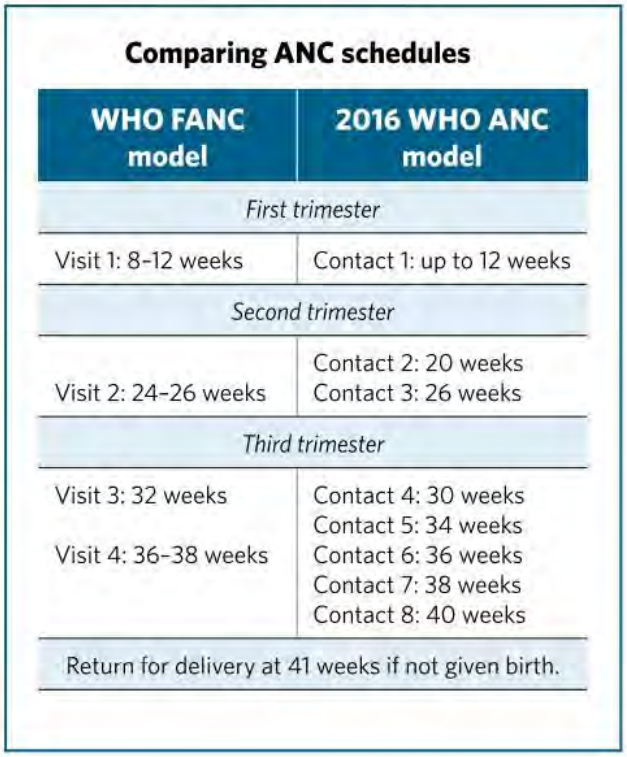
In Ghana, ANC prototype depends on the leading prototype used in advanced nations. This prototype requires gestational ladies to make ANC visits once per month for the first half year and every other month for the following 2 months and after that week by week until delivery (Ntui et al., 2016). Whilst antenatal care in developed nations is depicted by many numbers of ANC visits and early inception, it is the inverse in industrialized nations with less, late or no antenatal visits (Asundep et al., 2013). ANC utilization improved in low- and middle-income countries (LMICs) since the initiation of the WHO ANC show in 2002, known as focused ANC (FANC) or fundamental ANC, which was an objective orientated way to deliver proof based intervention completed at four critical occasions during gestation (WHO, 2016). However, from 2007–2014, 64% of pregnant ladies achieved the WHO-suggested four or more visits for ANC globally. This suggested that a lot of work needed to be done to enhance ANC usage and quality. Moreover, evidence on the probable danger of the FANC model has become available, requiring an evaluation (WHO, 2016).

In 2016, the WHO introduced a new ANC model which is known as the 2016 WHO ANC model. The goal of this model is supplementing existing WHO guidelines on the management of specific pregnancy related difficulties. The direction is purposely to review and address the complex issues surrounding the practice and delivery of ANC, and to make person-centered health and well-being a priority– not only the elimination of diseases and deaths (WHO, 2016).

The 2016 WHO ANC model recommends at least eight ANC visits, with the initial visit planned to commence in the first three months (up to 12 weeks of pregnancy), two visits scheduled in the

second trimester (at 20 and 26 weeks of gestation) and five visits scheduled in the third trimester (at 30, 34, 36, 38 and 40 weeks of gestation) (WHO, 2016). Unique in relation to the FANC model, an extra visit is suggested at 20 weeks of pregnancy, and an extra three visits are prescribed in the third trimester (WHO, 2016). The details of the WHO model are shown in figure 2.3

Figure 2.3: 2016 WHO ANC model



Comparing ANC schedules

WHO FANC model	2016 WHO ANC model
First trimester	
Visit 1: 8–12 weeks	Contact 1: up to 12 weeks
Second trimester	
Visit 2: 24–26 weeks	Contact 2: 20 weeks Contact 3: 26 weeks
Third trimester	
Visit 3: 32 weeks Visit 4: 36–38 weeks	Contact 4: 30 weeks Contact 5: 34 weeks Contact 6: 36 weeks Contact 7: 38 weeks Contact 8: 40 weeks
Return for delivery at 41 weeks if not given birth.	

Adopted from WHO, 2016

There is a checklist of interventions which are to be conveyed at each visit and insights about where they are delivered and by whom are not meant to be prescriptive but, fairly, comfortable to the individual woman and the local setting, to allow flexibility in the delivery of the recommended interventions trimester (WHO, 2016).

2.3 BENEFITS OF ANC

The aim of ANC is to eliminate health related complications in both the unborn child and mother and to make sure that every neonate has a decent beginning (Gebremeskel, Dibaba, & Admassu, 2015)

There are many factors that cause maternal mortality worldwide particularly in developing countries. These include hypertension, anemia, hemorrhage, blocked labour, risky abortion, ectopic pregnancy and specific prolonged nutritional deficiencies (Asare, 2010; Vermaak, 2015). Regular checkups of women during their pregnancy can prevent death from these complications. For instance, the blood pressure of a pregnant woman can be monitored through an ultrasound test; extreme anemia as a result of shortage of iron and foliate can be remedied by initiating iron and folic acid into the mother‟s dietary regimen; and dietary intercessions during gestation can help to minimize the possibility of increased weight during pregnancy. ANC services therefore present gestational women with arbitrations that are important to their wellbeing and their unborn children‟s health (Vermaak, 2015). In this way, ANC is one of the imperative factors in decreasing maternal diseases and deaths (Ye, Yoshida, Harun-Or-Rashid, & Sakamoto, 2010).

Antenatal care adds to great pregnancy results and regularly advantages of ANC are subject to the timing and nature of the care given (C. L. Banda, 2015). ANC provide advice, knowledge, encouragement, and assistance; to manage and treat small complication of gestation; and to provide effective surveillance during the gestation (Al-Ateeq & Al-Rusaiess, 2015). Furthermore, ANC provides the opportunity for interaction between gestational women and a health care personnel about health behavior during gestation and about detecting complications that may surface during that period (Al-Ateeq & Al-Rusaiess, 2015).

ANC provides an opportunity to assess the development of the fetus and provide acceptable intercessions to enhance the nutritional status of the mother (Vermaak, 2015). Furthermore,

immunization against tetanus during gestation is very vital and ANC helps to secure gestational women and fetus from tetanus. In addition, diseases such as malaria can be controlled. According to Kabir (2012), ANC services also provide essential health information about personal hygiene, importance of having balanced diet, eating nutritious food, infant and newborn care, breastfeeding practice, It also provides knowledge to the spouse and other family members of the family about their duties and how to support mothers psychologically during crucial period (Kabir, 2012). For instance, a research in India found that ladies who visited ANC services had a higher chance of utilizing skilled delivery attendants during childbirth, or having delivery at the healthcare facility (Titaley et al., 2010).

Attending ANC frequently implies that there is mostly enough time for rapid recognition and remedy of diseases such as sexually transmitted infections during gestation (Vermaak, 2015). Along these lines, the services given rely upon the quantity of ANC visits (Ntui et al., 2016). Be that as it may, a considerable lot of the pregnant ladies do not initiate ANC early, and are not benefiting from the services offered during this session. Majority of them end up with complications which lead to increase maternal and infant mortality rates (Cooper et al., 2016). For instance, a research in Mexico found a 76% risk for low birth weight related with untimely labor for ladies who got less ANC services amid pregnancy juxtaposing ladies who got more clinical services (Ntui et al., 2016). In a research done in Mexico, fewer number of ANC visits was related to 63% increased risk for intra uterine growth retardation (C. L. Banda, 2015). Similar results were observed in a Bangladeshi research where birth weight was positively related to the number of visits at ANC centers. Each of these findings point to the vital duty of ANC in recognizing and alleviating the possible difficulties in the course gestation (Banda, 2015).

2.4 Maternal Education and Utilization of Health Services

Maternal morbidity and mortality has reduced significantly in developed countries compared to developing regions of the world where most of the deaths occur (Kabir, 2012). Sociological theory conceptualize formal education as an experience that changes ladies' state of mind and impacts on their adoption of 'present day' thoughts. Research has hypothesized that going to school changes a woman‟s point of view about traditional gender duties, enabling her to achieve greater independence in decision-making within the household (Greenway et al., 2013). According to a study, MMR has a tendency to be higher in nations where female education rate is lower than their male partners (Kabir, 2012).

A study has demonstrated that illiteracy is one of the primary causes of poor maternal and kid wellbeing in Pakistan (Suqrat et al., 2017). Formal education expands women‟s understanding in health in one of these ways. First, formal education may directly acquaint ladies with school educational modules about science, germ hypothesis and disease grouping. This is usually alluded to as the 'information transfer hypothesis. Second, formal training may indirectly increase knowledge through the education abilities ladies are presented with in school (Greenway et al., 2013). A woman‟s health seeking behaviours is influenced by her level of education and preventive health care services are used more often by mothers with higher education than less educated mothers (Kabir, 2012). Educated women are likely to appreciate ANC services and will utilize it juxtaposed to women with lower education (Cooper et al., 2016). Educated mothers can read daily papers, flags, handouts, announcements and can better grasp every one of them which give mothers much chances to extend knowledge on their health (Greenway et al., 2013). Education increases awareness of causes and effects of negative health which in turn increases the demand and utilization of health care (Kabir, 2012). A lady's

expanded autonomy to settle on choices enables her to move about her community all the more openly and to effectively look for maternal and child wellbeing services as required (Greenway et al., 2013).

A mother provides guidance to infants in the initial stages of their lives, this is mainly dependent on her education and understanding. Increase in maternal education could reduce the incidence of childhood morbidity and mortality (Suqrat et al., 2017). In addition, children born to literate mothers had quality nutritional status with regards to weight and height. Maternal reading ability and age have been determined as relevant confounders for child buildup (Suqrat et al., 2017).

Improved maternal education may help women to empower and improve their ability to influence their surroundings as well as to have influence over their own health (Kabir, 2012). Education may also help women to be financially stable, have confidence in childbirth, expanded support and communication with husband and other relatives, which all can contribute in increased number of ANC visits. Moreover, education can reduce the impact of distance to health care centres and time to reach there as educated mothers will give priority to herself and the babies‟ health first (Kabir, 2012). More elevated amount of formal training is related with reduced instances of morbidities and better vaccination status of children (Suqrat et al., 2017). A formally educated mother can carry out effective health activities in her home. She is exposed to health care information. An informed mother will probably have a say in family wellbeing matters, decision making and appropriation of assets (Suqrat et al., 2017).

A study done in Ghana concluded that, “Women‟s attitude to antenatal care seems to be influenced by their schooling, since more years of education of a pregnant woman is associated with a choice for sufficient antenatal care” (Arthur, 2012). In contrast, a research conducted in Rwanda showed that no schooling is not associated with ANC usage (Rurangirwa, Mogren,

Nyirazinyoye, Ntaganira, & Krantz, 2017). Moreover, the education did not influence utilization of ANC services by gestational women in a study conducted in Sudan (Ali & Abdalla, 2016).

2.5 Other Factors influencing ANC attendance

Research has demonstrated that the age of a lady during her pregnancy is a critical factor that impacts the participation of ANC in Ghana. Older women (35 years of age or more) would probably have encountered dangers and intricacies during their past pregnancies and gained information of medicinal services administrations, which could have averted or enhanced these troubles, making them more prone to use ANC services. Furthermore, pregnancy complications increase with age, leading to increase in ANC utilization (Abekah-nkrumah & Abor, 2016). A study in Zambia observed that older women (35 years old and above) were 1.7 times more likely in attending maximum ANC than younger women (Cooper et al., 2016) . This could be possible because of knowledge of the benefits of ANC visits, attendance of the approved number of visits as well as experience with gestation and childbirth (Cooper et al., 2016). In a research done in Sudan, ladies between the ages of 25-29 were more likely to utilize ANC more than ladies who were under 25 years (Ali & Abdalla, 2016).

In contrast, a study conducted in South Sudan showed that women who were aged 34 and above were less likely to utilize ANC than women between the ages of 15 - 24 years (Vermaak, 2015). Moreover, a study showed that the risk for poor usage of ANC services was 78% as high in the elderly women when contrasted with ladies aged 30 years or less (Rurangirwa et al., 2017). A study in Democratic Republic of Congo found that under 18 years and those aged over 34 years seemed fewer in booking ANC in the first quarter visit. The stigmatization from other women when conceiving in late or young age could be a cause of the late ANC services booking (Nsibu et al., 2016).

Marital status is one of the factors that affect utilization of ANC. A study conducted in Brazil showed that a single woman during gestation was associated with higher odds of insufficient utilization of ANC than living with the child‟s father in the same household. The absence of the male parent is known to affect the children‟s health and development negatively and is perceived to have an impact on other maternal practices (Surkan, Olinto, & Bassani, 2009). A study conducted in Rwanda showed that women who were single, divorced, widowed or separated made less ANC visits compared with women who were married (Rurangirwa et al., 2017). The odds of married women attending the recommended ANC visits was 7.3 times more than that of the single women in a study conducted in Sierra Leone (Chege, 2018). A study also showed that single ladies had higher chance not to adhere to prescribed ANC visits compared with their married counterparts. This could be as a result of lack of support from the partner, weak financial status or unplanned pregnancies (Chege, 2018). On the contrary, a study conducted in Brazil showed that married women were at higher risk for insufficient utilization of ANC in Ribeirão Preto than São Luís (Mekonnen & Asnaketch, 2002). This might be because of contrasts in the social acknowledgment of marital status between the two urban communities. Likely, "living together" is less socially acknowledged in Ribeirão Preto than in São Luís (Mekonnen & Asnaketch, 2002).

Household wealth is one of the determinant factors in the use of ANC services. It basically relies upon ladies and their accomplices' employments or their family's riches (Vermaak, 2015). According to Kabir (2012), household wealth status was found to be a significant determinant for the number of ANC visits in Bangladesh. A study conducted in Ghana showed that ladies in higher riches quintiles would probably make more ANC visits than ladies with low income(Arthur, 2012). This may be as a result of the costs (directly or indirectly) that come with it and those with the assets werer more likely to pay for it (Arthur, 2012). A study in South

Ethiopia also found that pregnant women with low monthly pay had higher odds of late ANC attendance compared with their counterparts (Gebremeskel et al., 2015).

Furthermore, there was a significant relationship between income and ANC usage in a study conducted in Brazil (Surkan et al., 2009). In addition, women who were in the highest percentile of income groups were 3.12 times more probable to attend ANC than women in the lowest percentile in a study done in Bangladesh (Haque & Haque, 2014). Wealthier women and women with health insurance coverage, were more probable to have a delivery by a health personnel compared with women who were poor and women with no health insurance in a study conducted in Ghana (Amoakoh-coleman et al., 2015). More so, women in the uppermost wealth quintile had 3.5 times higher odds of visiting ANC compared with those who had small incomes in South West Shoa Zone of Ethiopia (Wilunda et al., 2015). A research also established a strong association between employment and ANC service usage in Nairobi, Kenya. Jobless mothers were 0.699 likely to attend ANC services than the employed mothers. It was concluded that the way that employed ladies in Nairobi were more likely to use ANC services shows that, earning ability is one of the variables for ANC usage (Barasa, Wanjoya, & Waititu, 2015).On the other hand, there was no association between household assets and poor utilization of ANC services in a research conducted in Rwanda (Rurangirwa et al., 2017).

Some studies have shown significant association between number of children by mothers and ANC service usage but others have shown contrary (Barasa et al., 2015). A research found that ladies with one or two babies were more likely to attend the health facilities for ANC compared with those that had more than 5 children (Barasa et al., 2015). Perhaps, this could be as a result of the fact that having many children is largely related to increased responsibilities and therefore mothers do not have enough time to attend to health facilities (Barasa et al., 2015). Additionally, a study in determining the insufficient usage of ANC services among Brazilian women observed a significant association between parity and inadequate ANC after adjusting for socioeconomic

status (Surkan et al., 2009). More so, a study has shown that parity had significant effects on ANC visits where women having 6 children or more were almost 12 times less likely to visit ANC compared with the women who were having their first child (Kabir, 2012). In addition, a study on factors affecting ANC utilization in South Sudan showed that mothers with at least six children had increased odds to utilize ANC than those with at most two offsprings (Vermaak, 2015).

A research done in Ghana on wealth and ANC use showed that ANC utilization reduces as the number of children increased. This could be because of the way that a lady who had conceived an offspring might be hesitant to use ANC services for later pregnancies either because of an awful experience with the service or maybe she starts to believe that she knows about what is expected of her during pregnancy (Arthur, 2012).

On the contrary, Chege (2018), found no significant relation between parity and the usage of ANC services in determining the geographic variations in antenatal care services in Sierra Leone. A study in determining ANC attendance among pregnant women living in endemic malaria Settings in DR Congo, found no relationship between gravidity and the timing of antenatal booking (Nsibu et al., 2016). Furthermore, a study in determining the association between higher educational attainment and optimal ANC visits among childbearing women in Zambia showed no association between parity and the ANC utilization (Cooper et al., 2016).

Place of residence could also affect ANC utilization. A research showed that expected mothers in the urban areas utilizes ANC services more than their rural counterparts(Arthur, 2012). Also a study has shown that more than a third of the women in the rural areas travel at least 5km to access ANC services in Ghana (Overbosch et al., 2004). Thus, accessibility to ANC services may

be much easier for the women in urban areas than the rural dwellers, thereby increasing the probability of an expectant mother in the urban area using ANC compared with her rural counterpart. In Ghana for instance, there are places in some regions which are more likely to default in the use of ANC, because of their location. There are far to reach hinterlands across most of the regions in Ghana which are hardly accessible by road. These villages lack most of the basic necessities in life. The have poor road network especially in the rainy season (Dikenoo, 2015). A study has shown that for maximum number of antenatal visits, the gap between the rural and urban remains large (Abekah-Nkrumah & Abor, 2016). Furthermore, a study in Ghana found that women from rural areas were less likely to use the services of doctors and nurses during antenatal care as compared to those from the urban areas (Dickson et al., 2017).

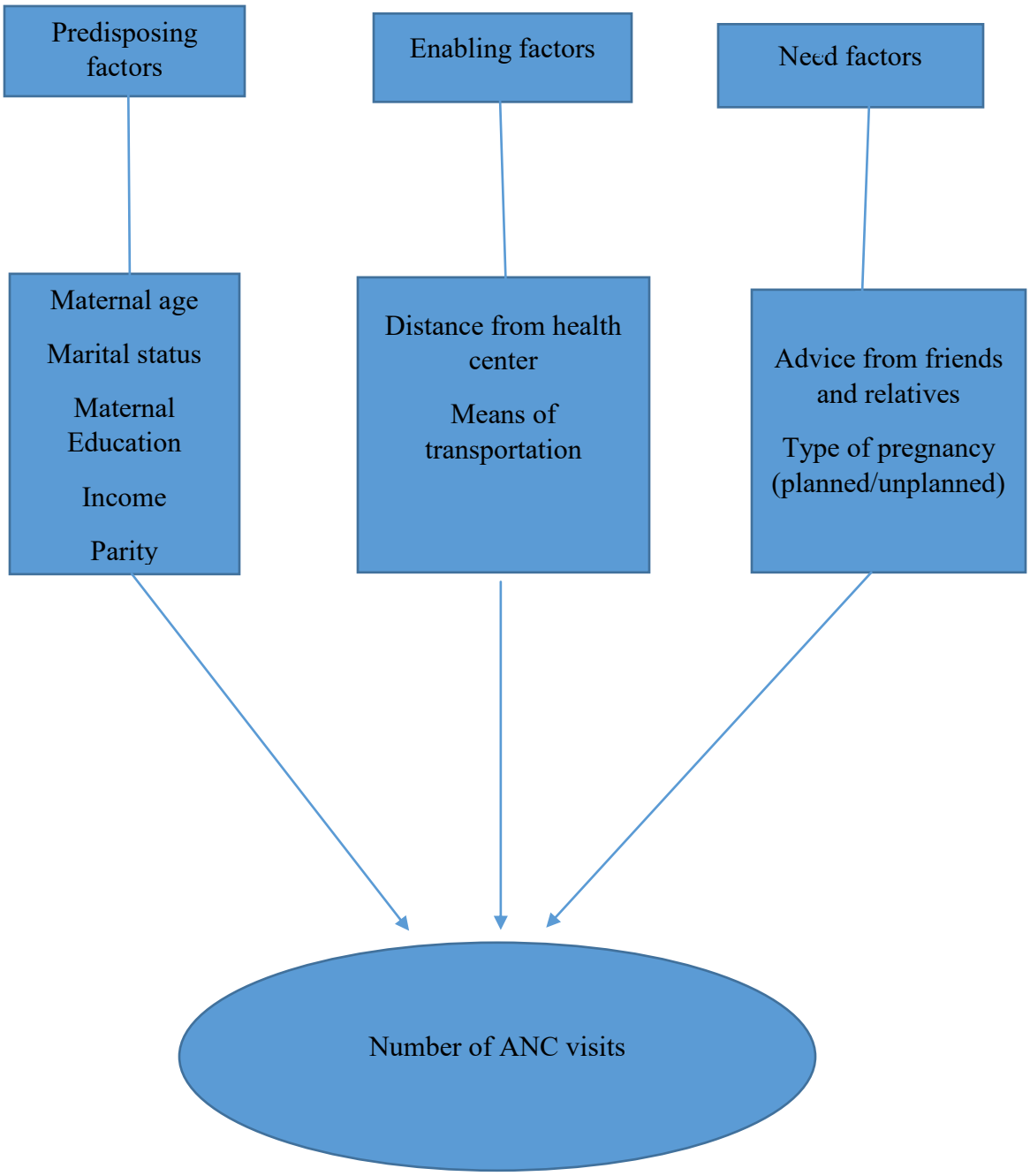
Related to this is the distance to the health centre and means of transportation a woman may encounter in utilizing health services. Thus, these can greatly impede the utilization of the ANC services since they serve to discourage the woman who may have to travel along bad road networks or may have to travel for long distance before being able to access a health center for ANC (Dikenoo, 2015). Even if the mother does it the first time, subsequent visits may be impeded due to the struggle to get to the health facility, thereby reducing adequate utilization. On the contrary, a study in Ethiopia found no association between ANC utilization and distance from the health facility even though 42 % of participants were staying more the 1 hour from the nearest health facility (Wilunda et al., 2015).

A research in Zambia showed that women with unplanned pregnancies are less likely to utilize ANC services compared with women with planned pregnancies (Banda et al., 2012). Furthermore, a study in Ethiopia showed that women with unplanned pregnancies had higher risk for initiating ANC late compared with women who had planned pregnancies (Gebremeskel et al., 2015). More so, a research done in southwestern Ethiopia showed a significant association

between unplanned pregnancies and the utilization of maternal health services. Mothers with unplanned pregnancies were less likely to utilize ANC services compared with women with planned pregnancies(Wado, Afework, & Hindin, 2013).

A study done in Uganda showed that husbands have influence on ANC attendance by pregnant women. Hence, encouraging partners to escort their wives to attend ANC would motivate many mothers completing ANC visits (Kawungezi et al., 2015). More so, a study showed that women who did not receive advice had high risk for late ANC attendance compared with those who received advice (Gebremeskel et al., 2015).

2.6 Conceptual framework



2.6.1 Narrative of conceptual framework

The conceptual framework of the study uses three levels of factors influencing ANC attendance. These levels are predisposing factors, enabling factors and need factors.

Inclining/predisposing factors incorporate biological factors that may impact the probability of a person utilizing the ANC services. They include maternal age, marital status, parity and

educational level. According to Pell et al. (2013), parity has an impact on ANC initiation, for instance, unfamiliar to the experience of pregnancy, the signs and symptoms associated with pregnancy, some pregnant women are more likely to start ANC earlier. There is a propensity of starting ANC late among women who have many children. This could be as after effect of constrained assets in the family and negative recognitions coming about because of past pregnancy encounters (Banda & Michelo, 2012). Women with high number of children have a tendency to depend on their past pregnancies encounters and don't see the need for antenatal visits (Banda & Michelo, 2012). A research done in Zambia concluded that higher education in women is associated with increased utilization of maternal and child health services (Cooper et al., 2016). Also, according to a study done in Congo, pregnant women at the university level who initiated ANC in the first trimester represent 30.3% against 10.3% at the secondary level and 15.1% at the primary level and also educated women seem to be more motivated to take part in early antenatal services than those who were not (Nsibu et al., 2016). Furthermore, a study done in Ghana concluded that formal education builds mothers' comprehension of numerous measurements of wellbeing and demonstrate that this comprehension of wellbeing converts into higher utilization of maternal and child wellbeing services (Greenway et al., 2013). Adolescents and unmarried younger women hide their pregnancies to prevent possible pregnancy implications from the society: stigmatization, exclusion from school and gossip which in turn affects the early initiation of the ANC (Pell *et al.,* 2013).

Financial and organizational factors serve conditions that enable ANC service. Enabling elements or assets incorporate qualities, for example, maternal salary, means and cost of transportation, status of payment of ANC and distance from the health center. Low income is related with expanded chances of underutilizing antenatal care services among pregnant mother. This could be a result of the way that better income may expand the capacity to pay for human services administrations, transportation, and other roundabout expenses (Gebremeskel et al.,

2015). Study has demonstrated that distance from health facility and time to the closest wellbeing offices impact wellbeing administrations use, long travel time declined by poor transportation prevent pregnant women from attending antenatal services, (Titaley et al., 2010). According to Banda and Michelo (2012), inadequate health facilities significantly affect the timing of antenatal attendance.

Need factors of ANC utilization by pregnant women include health beliefs and psychosocial factors when accessing ANC utilization by pregnant women. These include awareness of pregnancy, type of pregnancy (wanted or unwanted) and advice from family and friends. The craving of pregnancy is an essential causal factor of ANC utilize. Gestational women with spontaneous pregnancies make less ANC visits (Banda, 2015). Research has found that pregnant ladies who have the mindset that no advantages are obtained from ANC tend to start ANC late (Banda & Michelo, 2012). Additionally pregnant ladies who don't get guidance on suggested time are 3 times more inclined to book late for their first ANC visit when contrasted with their partners who get counsel (Gebremeskel et al., 2015).

CHAPTER THREE

METHODS

3.0 Introduction

This chapter describes the research design and the methodology. This includes study design, study population, sampling procedure, data collection, data analysis and ethical consideration.

3.1 Study design

This is a study which used questionnaires to collect data from a representative sample of the people utilizing the Old Tafo Government Hospital. The questionnaires were given to each individual from which response were collected and coded for analysis. This study was a quantitative study, employing frequencies, bivariate and multivariate analysis and other statistical methods

3.2 Study area

Old Tafo where the study was carried out is a town in the Kumasi Metropolitan Assembly in the Ashanti Region of Ghana near the regional capital Kumasi. Kumasi city is the most crowded area in the Ashanti Region with a populace of around 1,730, 249 individuals (GSS, 2014). The city covers 254 square kilometers and envelops 10 sub-metropolitan regions Manhyia, Tafo, Suame, Asokwa, Subin, Bantama, Kwadaso, Nhyiaeso and Oforikrom. Kuamsi has 649 public pre-primary, primary and junior high schools and two state funded universities. There are also about 1500 private educational institutions. Old Tafo is the thirtieth most populous settlement in Ghana with a population of 60,919. Old Tafo has one government hospital which is the Old Tafo Government Hospital that takes care of the health of the local population.

3.3 Study Population

This study targeted pregnant women and women who have delivered in old Tafo Hospital. The study population consisted of all pregnant women at 38 weeks of gestation and mothers who have given births not more than 1 month in Old Tafo Hospital.

Old Tafo where the study was carried out is a town in the Kumasi Metropolitan Assembly in the Ashanti Region of Ghana near the regional capital Kumasi. Kumasi city is the most crowded area in the Ashanti Region with a populace of around 1,730, 249 individuals (GSS, 2014). The city covers 254 square kilometers and envelops 10 sub-metropolitan regions Manhyia, Tafo, Suame, Asokwa, Subin, Bantama, Kwadaso, Nhyiaeso and Oforikrom. Kuamsi has 649 public pre-primary, primary and junior high schools and two state funded universities. There are also about 1500 private educational institutions. Old Tafo is the thirtieth most populous settlement in Ghana with a population of 60,919. Old Tafo has one government hospital which is the Old Tafo Government Hospital that takes care of the health of the local population.

3.4 Inclusion and exclusion Criteria

3.4.1 Inclusion criteria

Eligible women for this study were pregnant women at 38 weeks of gestation and women who have given birth not more than 1 month.

3.4.2 Exclusion Criteria

Pregnant women of less than 38 weeks at gestation were not included and also women who have given birth for more than 1 month were excluded**.**

3.5 sample size determination

The minimum sample size was determined using the Cochran‟s formula.

$$N_o = \frac{z^2 pq}{e^2}$$

N_o = minimum sample size

z = standard normal deviate (1.96)

p = 42.8% prevalence of pregnant women who attend the recommended ANC visits

q = 0.572

e = degree of precision, set at 5% = 0.05

Substituting, $N = \frac{(1.96)^2 \times 0.428 \times 0.572}{0.05 \times 0.05}$

$$= \frac{3.8416 \times 0.428 \times 0.572}{0.05 \times 0.05}$$

$$= \mathbf{376}$$

Ten percent non-response rate was calculated and added to make a total of **414**

3.6 Sampling procedure

Study participants were recruited using the consecutive sampling approach, where every woman who met the inclusion criteria was selected. Consent was sought from participants before participating in the research. The sample size (414) was divided by the number of days (30 days) designated for data collection to obtain the daily target (14). This was used until the total sample size was obtained.

3.7 Study variables

3.7.1 Dependent variable

Variable	Operational definitions	Scale of measurement	Type of variable
ANC visits	Woman who visits/consults ANC providers during pregnancy period will be considered to have used antenatal care	Ordinal	Categorical

3.7.2 Independent variable

Variable	Operational definitions	Scale of measurement	Type of variable
Maternal education	Last institution attended be it primary, secondary, tertiary and none	ordinal	Categorical

3.8 Data Collection Methods and Instruments

Pregnant women at 38 weeks of gestation and women who have given birth not more than 1 month who come to the hospital were explained to, in detail, the study conducted to get their approval to become participants. Self-administered structured questionnaire were given to participants to fill. For participants who cannot read the research assistant interpreted questions and helped them fill the questionnaires. The questionnaire was divided into three sections: the first part sought to find out individual characteristics including age, level of education, parity, income status, marital status and occupation; the second part was the usage of ANC services by women in gestation including the gestation period they started ANC service, the reasons they attended the ANC, the number of times they attended/ have attended ANC and the people who examined them during the ANC services; the third part was knowledge and awareness of maternal health care.

3.9 Data Analysis

Collected data were coded and entered into excel and subsequently migrated into Stata (version15) Software for statistical analysis. Frequency distribution were done to compute proportions on parity, educational level, marital status, religion, occupation, distance from health center, and means of transportation to the health center. Mean age and Mean income and their respective standard deviations were computed.

Bivariate analysis was used to test the relationship between maternal education and ANC attendance. Chi-square test was used to test the relationship between other categorical variables and ANC and student t-test was used to test for the association between continuous variables and ANC Significance was set at $p<0.05$ with 95% CI.

Logistic regression was used to test for the level of association between maternal education and ANC visit using no formal education as the reference variable and significance was set at $p<0.05$ with 95% CI.

3.10 Quality Assurance

Research assistants were trained on appropriate data collection skills and data entry to ensure uniformity and accuracy of data collected.

3.11 Ethical Consideration

Endorsement of the research was granted by Ghana Health Service Ethical Review Committee (GHS/RDD/ERC/Admin/App/18/208). Following this, authorization was sought from the authorities of the hospital before data collection. Correspondingly, every respondent was approached to express acceptance before cooperation. Before members were interrogated, everyone was given a consent to read and sign. For people who couldn't read, the reason for the research was disclosed to them and if they accepted to partake, their thumbprints were taken. All respondents were given guarantee that any information they provided was surely going to be used solely for academic purposes and their confidentiality was therefore, guaranteed. Respondents were assured that the research would come to them at no risk or cost except their precious time that they used to fill the questionnaire. Privacy was ensured during the data collection. Lastly, any information received in the research were properly credited to those it was gotten from.

CHAPTER 4

RESULTS

4.0 Introduction

This chapter presents the analysis and findings of the study. This includes the descriptions of socio-demographic characteristics, bivariate and multivariate analysis used in the study.

4.1 Characteristics of participants

Four hundred and fourteen (414) questionnaire were administered for data collection and all were used in the analysis. The ages of the respondents ranged between 18 and 45 years with a mean and standard deviation of 27.8 and 4.7 respectively. Majority, 317(77.1%) of the women were Christians. More than half of the respondents were married 268(65%). Few of them had no formal education 36(8.7%). Those who were employed were 295(71.3%). More than half 292(70.1%) of the participants earned GHS600 or more monthly and the average income was 521.4 ± 471.1. Less than a quarter 93(22.1%) walked from their various homes to the hospital and majority 294(71.2%) of them were leaving about 5 kilometers or less away from the hospital. Table 4.1 shows the distribution of demographic characteristic of the respondents

Table 4.1 Socio-demographic characteristics of respondents

Variable	Frequency	Percentage
Age (years)		
18-25	123	29.7
26-35	270	65.5
36-45	21	5.1
Mean ± SD	27.8 ± 4.7	
Religion		
Muslim	94	22.9
Christian	317	77.1
Marital status		
Single	96	23.3
Married	268	65.0
Cohabiting	37	9.0
Divorced	6	1.5
Widowed	5	1.2
Educational level		
No formal education	36	8.7
Primary education	123	29.7
Secondary education	137	33.1
Tertiary education	118	28.5
Occupation		
Unemployed	101	24.4
Employed	295	71.3
Other	18	4.4
Income		
≤600	292	70.5
>600	122	29.5
Mean income	521.4 ± 471.1	
Means of transportation		
Walk	93	22.5
Public transport	266	64.3
Drive	55	13.3
Distance from health facility		
≤5km	294	71.2
>5km	119	28.8
Mean distance	1.29 ± 0.02	

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Drive	55	13.3
Distance from health facility		
≤5km	294	71.2
>5km	119	28.8
Mean distance	1.29 ± 0.02	

SD = standard deviation

4.2 Number of ANC attendance

Out of the 414 respondents, 31 (7.51%) of them satisfied the WHO recommendation of eight (8) or more ANC attendance at the Old Tafo Government Hospital. The results are shown in figure 4.2

In table 4.2, the distribution of women who satisfied the WHO recommended number of ANC visits before delivery is shown. Most 14(45.2%) of them had completed the tertiary education. Majority 23(74.2%) of them were between the ages of 26-35. More than half 21(67.7%) were married women. Additionally, more than three quarters 24(77.4%) were Christians. Furthermore, majority 25(80.7%) of the women who satisfied the WHO recommended number of ANC visits were employed. Women who used public transportation during ANC visits were more than half 17(54.8%). More so, all the women who attended ANC 8 or more times travelled less than five kilometers to the health facility. Amongst the women who made the recommended number of ANC visits by the WHO, 12(38.8%) had three or more children and 20(64.5%) earned more than GHS260.

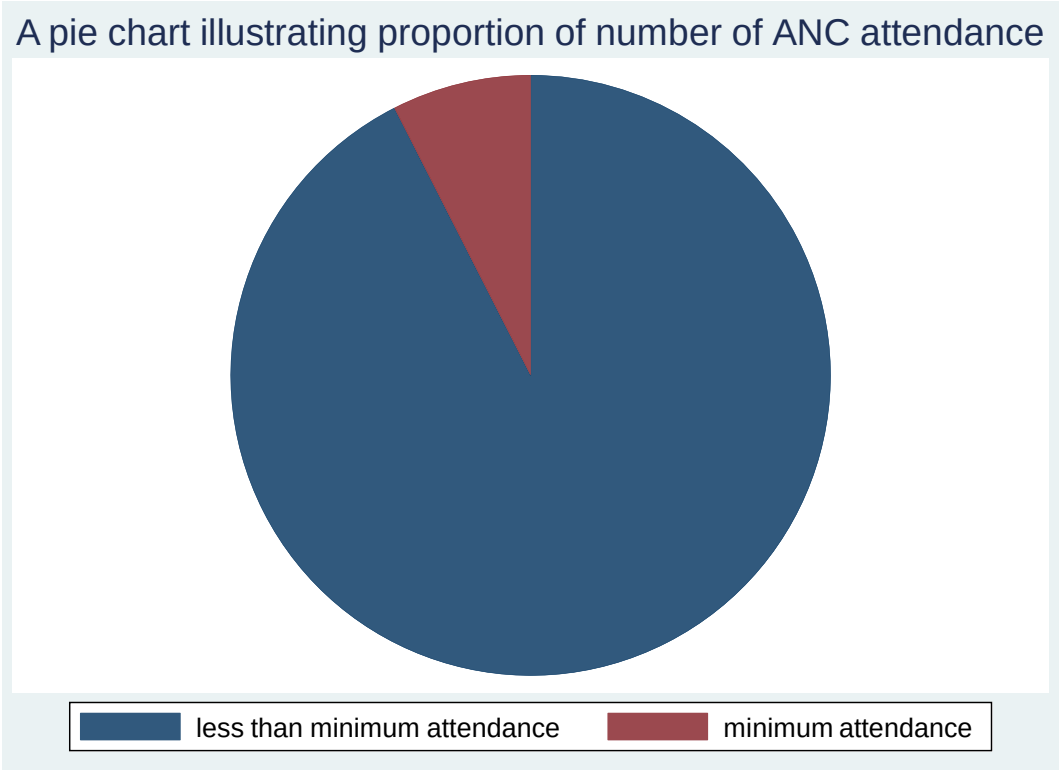

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Figure 4.2 Proportion of number of ANC attendance amongst participants

Table 4.2 Distribution of respondents who attended the recommended WHO ANC visits at the Old Tafo Government hospital

Variable	Frequency	Percentage
Education		
No education	3	9.7
Primary education	4	12.9
Secondary education	10	32.3
Tertiary education	14	45.2
Age		
18-25	6	19.4
26-35	23	74.2
36-45	2	6.5
Marital status		
Single	5	16.1
Married	21	67.7
Cohabiting	4	12.9
Divorced	0	0.0
Widowed	1	3.2
Religion		
Muslims	7	22.6
Christians	24	77.4
Occupation		
Unemployed	5	16.1
Employed	25	80.7
Other	1	3.2
Means of transportation		
Walk	7	22.6
Public transport	17	54.8
Drive	7	22.6
Distance		
≤5km	31	100.0
>5km	0	0.0
Type of family		
Nuclear	20	64.5
Extended	11	35.5
Parity		
1	8	25.8
2	11	35.5
3 or more	12	38.8
Income		
≤260	11	35.5
>260	20	64.5

4.3 Association between maternal education and ANC attendance

The association between maternal formal education and ANC attendance is shown in table 4.2A.

Maternal education had no association with ANC attendance at the Old Tafo Government Hospital. In addition, no other factor was associated with antenatal care attendance at the Old Tafo Government Hospital. The mean number of children by women who satisfied the WHO recommended ANC number was almost similar to that of those who did not make the recommended ANC number visits; 2.19 ± 0.76 and 2.05 ± 0.06 respectively. Moreover, those who satisfied the recommended ANC visits also had the same mean age with those who did not make the recommended visits; 27.87 ± 0.76 and 27.74 ± 0.25 respectively. Women who made the 8 or more visits before delivery had a higher mean age than those who made less than 8 visits. The mean income of women who attended ANC 8 or more was 483.87 ± 435.49 which was lower than those who made 7 or less ANC visits

Table 4.3 Association between maternal education and ANC attendance

Variable	Adequate attendance n(%)	Inadequate attendance n(%)	X^2	P-value
Education				
No education	3(8.3)	33(91.7)		
Primary	4(3.3)	119(96.7)	6.60	0.09^{α}
Secondary	10(7.3)	127(92.7)		
Tertiary	14(12.0)	103(88.0)		
Marital status				
Single	5(5.2)	91(94.8)	2.95	0.57^{α}
Married	22(7.9)	246(92.1)		
Cohabiting	4(10.8)	33(89.2)		
Divorced	1(20.0)	4(80.0)		
Occupation				
Unemployed	5(5.0)	96(95.0)		
Employed	25(8.5)	269(91.5)	1.47	0.48^{α}
Other	1(5.6)	17(94.4)		
Means of transportation				
Walk	7(7.5)	86(92.5)		
Public transport	17(6.4)	248(93.6)	2.61	0.27^{α}
Drive	7(12.7)	48(87.3)		
Parity				
Mean ± SD	2.19 ± 0.76	2.05 ± 0.06		0.43^{∞}
Age				
Mean ± SD	27.87 ± 0.76	27.74 ± 0.25		0.87^{∞}
Income				
Mean ± SD	483.87 ± 435.49	524.03 ± 474.82		0.63^{∞}
Distance				
Mean ± SD	1.29 ± 0.02	1.19 ± 0.72		01.19^{∞}

N = frequency X^2 = chi square value α= p-value derived from chi square test
SD = standard deviation ∞ = p-value derived from t-test

4.4 Influence of maternal education on ANC

Table 4.3B shows the rate of association between maternal education and ANC attendance. Maternal education did not have influence on ANC attendance. Also after adjusting, there was no significant association between maternal education and ANC attendance.

Table 4.4 Logistic regression of maternal education and ANC attendance

Variable	(uOR) 95%	P-value	(AOR) 95%	P-value
Education				
No education (ref)	1			
Primary	0.37	0.21	0.34	0.21
Secondary	0.87	0.83	0.96	0.95
Tertiary	1.50	0.55	1.78	0.45
Marital status				
Single (ref)	1			
Married	1.55	0.39	0.94	0.92
Cohabiting	2.21	0.26	1.96	0.37
Widowed	4.51	0.21	3.41	0.37
Religion				
Muslims (ref)	1			
Christians	1.02	0.96	0.94	0.89
Occupational status				
Unemployed (ref)	1			
Employed	1.78	0.25	1.77	0.58
Other	1.13	0.91	0.69	0.7
Means of transportation				
Walk (ref)	1			
Public transport	0.84	0.71	0.80	0.65
Drive	1.79	0.30	1.29	0.70
Income				
≤260 (ref)	1			
>260	1.04	0.91	0.74	0.52
Age	1.00	0.88	0.95	0.29
Distance	0.58	0.22	0.54	0.22
Parity	1.09	0.55	1.14	0.50

Ref = reference variable UOR = unadjusted Odds Ratio AOR = Adjusted Odds Ratio

4.5 Interpretation of variables from logistic regression model using the odds ratio

4.5.1 Education

Maternal education did not have influence on ANC attendance. Furthermore, after adjusting, there was no significant association between maternal education and ANC attendance. The adjusted odds ratio of the logistic regression showed that, the odds of a woman who had a primary education of making the WHO recommended ANC attendance was 0.34times compared with a woman who had no formal education. Additionally, the odds of a woman who had a secondary education of attending 8 or more ANC visits was 0.96times compared with a woman who had no formal education. More so, a woman who had a tertiary education had an odds of 1.78times higher of making the WHO recommended number of ANC compared to a woman who has no formal education. But all these associations were not significant.

4.5.2 Marital status

The odds of a married woman making the WHO recommended number of ANC visits was 0.92times compared with a single woman. Moreover a cohabiting woman had 96% increased odds of attending the WHO recommended ANC visits compared with a single woman. A widow had a 3.41times odds of attending the WHO recommended number of ANC compared with a single woman. But all these associations were not significant.

4.5.3 Religion

Comparing Muslims with Christians, Christians had 0.94times odds of attending 8 or more ANC visits before delivery but this association was not statistically significant.

4.5.4 Occupation

An employed woman had a 77% increased odds of attending 8 or more ANC visits before delivery compared with an unemployed woman. This association was also not statistically significant.

4.5.5 Means of transportation

A woman who attended ANC using the public transport had 0.8times odds of making 8 or more visits compared with a woman who walked to the hospital. Furthermore, a woman who drived to the hospital for ANC services had 1.29times odds of attending the WHO recommended number of ANC by WHO comparing with a woman who walked to the hospital. But this association was not statistically significant.

4.5.6 Income

There was a positive association between income and ANC. But after adjusting, there was a negative association between them. The adjusted odds ratio suggests that an increase in income is related to 0.74times increase in odds of attending recommended number of ANC.

But all these associations were not significant.

4.5.7 Age

There was no association between age and ANC. But after adjusting, there was a negative association between them. An increase in age of a woman is associated with 0.95times odds of making the recommended number of ANC visits.

But this association was not significant.

4.5.8 Distance

There was a negative association between the distance of a woman from the hospital and ANC attendance. An increase in distance is associated with 0.54times odds of attending the recommended number of ANC visits.

The association between distance and ANC attendance was also not significant.

4.5.9 Parity

There was a positive association between the number of children a woman has and ANC attendance. An increase in parity is associated with a 14% increased odds of attending the recommended number of ANC visits by a woman at the Old Tafo Government Hospital.

But this association was not significant.

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CHAPTER 5

DISCUSSION OF FINDINGS

5.0 Introduction

This chapter shows the statistical relationships between the dependent variable and independent variables. It used the chi-square value (at 0.05 significance level) to determine which variables were statistically associated. The probability values less than 0.05 showed that the variable in question is significant in determining the result of the outcome variable.

5.1 DISCUSSION

The purpose of the study was to investigate the influence of maternal education on the number of ANC at the Old Tafo Government Hospital. The number of respondents were 414 of which 7.51% attended eight (8) or more visits before delivery, this was in accordance with a study in Thailand that found that the utilization of ANC service was very low (Ye et al., 2010). This could be possible because people might be used to the old ANC recommendation (4+ visits) since the new ANC recommendation (8+) was recently introduced. But this was inconsistent with a previous study done in Kumasi, with 42.8% of respondents attending WHO‟s recommended minimum of 8 ANC visits (Ntui et al., 2016).

The study did not find any significant association between maternal formal education and the number of ANC attendance. This finding was similar to a study conducted in Ethiopia which showed no association between maternal level of formal education and the utilization of ANC (Wilunda et al., 2015). Furthermore, the finding corroborates a research which showed no association between maternal level of education and utilization of ANC services in Rwanda

(Rurangirwa et al., 2017). But the finding was inconsistent with a study conducted in Ghana which showed a significant association between maternal level of education and ANC attendance (Amoakoh-Coleman et al., 2015). Additionally, the results of the study was inconsistent with a research done in Bangladesh which showed strong associations between mother‟s level of education and utilization of ANC services (Kabir, 2012). Moreover, a study done in Ghana showed an association between maternal level of education and the utilization of ANC services (Greenway et al., 2013).

On the other hand, the research found that most (45.2%) of the women who attended the recommended number of ANC visits had tertiary education. This confirms a study done in Bangladeshi which showed that women with tertiary education attended the WHO recommended number of ANC visits more than the others (Kabir, 2012). This may be as a result of the sample containing large number of women having higher level of education than those with low or no education. This could also be as a result of women having higher level of education appreciate the benefits of ANC visits more than women with little or no formal education.

The study also found that women who were between the ages of 26-35 years attended the WHO recommended number of ANC visits more than women who were older than 35 years. This was in accordance with a study done in Nairobi, which found that women of ages 39 years and above were less likely to attend the recommended number of ANC (Barasa et al., 2015). This may be possible because older women might feel that they require few or no consultations than the younger women who have little or no experience in child birth related issues.

Moreover, employed women attended the WHO recommended number of ANC more than the unemployed women. This was in accordance with a research done in Nairobi, which showed that women who were not employed were 0.699 times less likely to use ANC services than the

employed mothers (Barasa et al., 2015). This could be possible as a result of inability to afford the ANC services.

The research found that married women attended the WHO recommended number of ANC visits more than single women. This was consistent with a study done in Rwanda which showed that single were more likely not to attend the recommended number of ANC (AOR, 2.99; 95% CI: 1.83, 4.75) (Rurangirwa et al., 2017). This could be due to the stigmatization attached to premarital pregnancy.

In this study, marital status was not significantly associated with the number of ANC attendance. Similar results were also reported in another study where significant difference was not observed in marital status and the utilization of ANC services (Wilunda et al., 2015). This also corroborates the findings of a study done in Nairobi, Kenya where there was no association between marital status and the utilization of ANC services (Barasa et al., 2015). Furthermore, a study found no significant association between marital status and with optimal ANC Visits among childbearing women in Zambia (Cooper et al., 2016). However, this finding contradicts a study conducted which showed that women who were single, divorced, widowed or separated were at a higher risk for poor utilization of ANC services as compared with married women, OR 2.99 95% CI: 1.83, 4.75 (Rurangirwa et al., 2017). In addition, a study in Ethiopia showed a significant association between marital status and utilization of maternal health care services (Mekonnen & Asnaketch, 2002), which contradicts the findings of this study.

The findings in this study revealed that there was no significant association between the employment status and the number of ANC attendance. This was similar to a research which found no association between occupation when compared with the utilization of ANC services in Sudan (Ali & Abdalla, 2016). But the results of a study done in Nairobi was inconsistent with the current study, which showed a significant association between occupational status and the

utilization of ANC services with unemployed mothers being 0.699 times less likely to utilize ANC services than the employed mothers (Barasa et al., 2015).

There was no association between the religion of the respondents and the number of ANC attendance in this research. This finding was not consistent with a study done in Ghana, which showed that Muslims were less likely to utilize ANC services compared with Christians (Abekah-nkrumah & Abor, 2016).

There was no association between income and the number of ANC attendance in this study. This was similar to a research conducted in Rwanda which showed that being poor, with no assets in the household, was not associated with poor ANC attendance (Rurangirwa et al., 2017).

In the study, there was no significant relationship between parity and utilization of antenatal care service. The relationship between parity and ANC attendance was also significant. But a research done in Ghana showed that first timers‟ used more reproductive health inputs compared with women with later order births (Abekah-nkrumah & Abor, 2016). In addition, a study showed that mothers with 5 or more children were 0.120 times likely to utilize the ANC service than those who had less than 5 children (Barasa et al., 2015).

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter seeks to show the summary and conclusion of the work. More so, it shows contribution to knowledge, recommendations given and the limitation and future research of the study.

6.1 Summary

The objective of the study was to find the influence of maternal education on ANC attendance at the Old Tafo Government Hospital. Bivariate analysis was used to examine the relationship existing between the independent variable and the antenatal care utilization. It was found out in the bivariate analysis that there is no significant association between maternal education and antenatal care utilization at the Old Tafo Government Hospital. The binary logistic regression was used because the dependent variable is dichotomous.

6.2 Conclusion

There was no significant association between maternal education and ANC attendance, but Mothers who had secondary and tertiary education were more likely to attend the recommended number of ANC.

From this study the proportion of women who attended 8 or more ANC before delivery was 7.5 per 100 women.

Also the research found that employed mothers were more likely to attend the minimum number of ANC visits more than unemployed mothers.

Furthermore, women between the ages of 25-36 attended the recommended number of ANC visits more than women above 40 years.

6.3 Recommendations

Based on the findings of the study the researcher has come out with these recommendations.

The Ghana Health Service (GHS) should formulate policy which will facilitate attending the recommended number of ANC visits, especially amongst single women, the older women, illiterates and the unemployed women.

Increasing awareness of the public on the relevance of early initiation, and having completed the recommended ANC visits, should be a major priority.

6.4 Strengths and limitation to the Study

This research was carried out amongst women who were at present utilizing or had very recently been utilizing ANC, thus the data was not based on women who had utilized ANC many years before this study. The research managed to recruit all planned subjects, none of the respondents approached and health care workers declined to partake in the study. There were also few missing data subsequently almost every variable was analyzed without being influenced by missing data.

But the study had some limitations which included being a cross sectional study, there was a possibility of recall bias regarding issues related to early pregnancy. Also the distance covered by respondents to the health facility was measured with self-report which may not be accurate

6.5 Future Research

A community-based study should be done to determine the factors that influence Antenatal Care utilization in Old Tafo.

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Appendices

Appendix A: Inform Consent

THE INFLUENCE OF MATERNAL EDUCATION ON ANTENATAL CARE ATTENDANCE IN OLD TAFO

Principal Investigator: ADU, EMMANUEL KWADWO

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF HEALTH POLICY PLANNING AND MANAGEMENT

UNIVERSITY OF GHANA

LEGON

Contact: 0542992431/ aduemmanuelkwadwo@yahoo.com

My name is Adu, Emmanuel Kwadwo. I am a graduate student of University of Ghana School of Public Health undertaking a research on **influence of maternal education on antenatal care attendance in Old Tafo**. Three research assistants will be assisting in the study. The study seeks to find out the influence of maternal education on ANC attendance. Participants are required to share their experiences on ANC by responding to questions.

Personal information that will lead to identification of participants will not be included in the questionnaire. Questionnaire clients will respond to will be anonymous (will not bear names of participants) so you will not be identified. You are free to be part of the study and decide to leave at any point you want. However, be assured that your privacy and confidentiality will be respected. Be assured that the research come at no risk and no cost except the precious time that they will used to fill the questionnaire. You can choose a place of convenience to answer the questions.

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title "**influence of maternal education on ANC attendance**" has been explained to me.

I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent to participate in this study as a volunteer.

Date _____ Signature or mark of volunteer _____

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the nature and purpose of this study were read to the volunteer. All questions asked were answered satisfactorily regarding participation in this study, and volunteer gave consent to participate in this study.

Date _____ Signature or mark of witness _____

If volunteer is below 18 years of age, a parent/Guardian must sign here:

I was present while the nature and purpose of this study were read. All questions asked were answered satisfactorily regarding participation in this study, and I gave consent to for my ward to participate in this study.

Date _____ Signature or mark of Parent/ Guardian _____

I certify that the nature and purpose in this research have been duly explained to the above individual.

Date _____ Signature of Person Who Obtained Consent _____

Appendix B (Questionnaire)

This is a research on influence of maternal education on ANC attendance. You are required to share your experiences on ANC by responding to the following questions.

Que No.	**Questions and Filters**	**Category Coding**	**Skip**
1.	How old are you? (*write in the space*)	_____ years	
2.	What is the highest level of school you attended?	Illiterate ☐ Primary ☐ Secondary ☐ Tertiary ☐	
3.	Type of family	Nuclear ☐ Extended ☐ Family size ____	
4.	How many children do you have?	_____	
5.	What is your present occupation?	Unemployed ☐ Self-employed ☐ Others _____	
6.	How much is your monthly family income?	_____	
7.	What is your religion?	Muslim ☐ Christian ☐ Others _____	
8.	How far is the nearest healthcare facilty from your house?	_____ kilometres	
9.	How do you travel to this facility?	Walk ☐ Public Transport ☐ Drive ☐	
10.	What is your present marital status?	Single ☐ Married ☐	

		Cohabiting ☐ Divorced ☐ Widowed ☐	

Part II: Information on Maternal Healthcare Utilization

Fill up the following information from question 11 to question 23 with reference to the most recent pregnancy and delivery in the last 1 month. Please tick in the spaces (√)

Que. No.	**Questions and Filters**	**Category Coding**	**Skip**
11.	Did you register your pregnancy at the primary health centre?	Yes ☐ No ☐	
12.	Did you receive health check-up (ANC) during your last pregnancy at least once?	Yes ☐ No ☐	If „NO" please go to question number 20
13.	Why did you go for an ANC check-up? *(more than 1 answer can be ticked)*	I was sick ☐ Advised by the lady health worker / ASHA worked ☐ Advised by my family members ☐ To start a regular check- up ☐	
14.	Which week of gestation did you go for your first ANC visit	_____	
15.	How many times did you receive antenatal care during this pregnancy or your last pregnancy?	_____	
16.	Who examined you during your antenatal	**Health personnel** Doctor ☐	

	checkups?	Midwife/Lady health visitor /ANM/Nurse ☐ Other health personnel ☐ **Non Health Personnel** Village Dai (TBA) ☐ Others_____	
17.	Did you receive the following services at-least once, during your pregnancy check-ups?		
	17.1 Tetanus injection on your arm	Yes ☐ No ☐	
	17.2 Iron tablets / syrup	Yes ☐ No ☐	
	17.3 Your weight was checked	Yes ☐ No ☐	
	17.4 Blood / Urine tests conducted	Yes ☐ No ☐	
	17.5 Blood pressure examined	Yes ☐ No ☐	
	17.6 Physical Examination	Yes ☐ No ☐	
18.	How many injections did you receive on your arm?	1 ☐ 2 ☐ 3 ☐ Don"t remember ☐	
19.	During your previous pregnancy, did you receive advice on :		
	19.1 Complications / problems during	Yes ☐ No ☐	

	pregnancy		
	19.2 Place of delivery	Yes ☐ No ☐	
	19.3 Nutrition during pregnancy	Yes ☐ No ☐	
20.	Why didn't you attend health check-up (ANC) during pregnancy? ***(can tick multiple answers)***	I was healthy ☐ I thought it was unnecessary ☐ Expenses of Check-up was unaffordable ☐ Clinic is too far away from home ☐ Family members disapproved ☐ Poor transportation facility to the health Facility ☐ was scared ☐ I thought I was healthy ☐ If any other reason , please specify _____	
21.	Where did you give birth to your baby?	At Home ☐ At Clinic/Hospital ☐	
22.	Who decided the place of delivery?	Myself ☐ My husband and me ☐ My family members ☐	
23.	Who conducted your delivery?	**Health personnel** Doctor ☐ Midwife/Lady health visitor /ANM/Nurse ☐ Other health personnel **Non Health Personnel** Village Dai (TBA) / ☐	

Part III: Information on Knowledge / Awareness level on Maternal healthcare Please tick in the spaces (√)

No	Questions and Filters	Category Coding		
24.	**What is your opinion on the following?**	Yes	No	Don"t Know
24.1	Check-up during Pregnancy reduces risk of dying			
24.2	First antenatal examination should be done within the first 3 months			
24.3	Tetanus injection helps both mother and child			
24.4	Anaemia be prevented by eating iron based food during pregnancy			
24.5	Pregnant women need calcium tablets			
24.6	Should pregnant woman often check blood pressure			
24.7	Delivery by a traditional birth attendant is healthy			
24.8	Feeding new born babies with powder milk is better than breast feeding			
24.9	Have you heard about ways or methods that women can use to avoid pregnancy?			
24.10	Pregnant women should visit ANC at least 8 times before delivery			