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SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

FACTORS ASSOCIATED WITH THE TIMING OF ANTENATAL CARE SERVICE INITIATION IN TWO HEALTH FACILITIES IN THE TAMALE METROPOLIS

BY

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DECLARATION

I hereby declare that this study report is the result of my own research and references made to the works of other researchers have been duly acknowledged. This dissertation has neither been presented in whole nor in part to any academic institution for the award of any degree.

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Dr. Abubakar Manu Date

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DEDICATION

This academic work is dedicated to my mother, Nabia Sumani Amina who has shown me love and encouragement during this journey of knowledge acquisition. It is also dedicated to my wife Ayisha Abdulai and my two children, Hibatullah Wumpini Sadique and Hammad Tipagya Sadique who I left in the bosom care of the Almighty God to pursue this academic exercise.

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ABSTRACT

Background: Starting maternal health care services within the first trimester of pregnancy is viewed as a strong determinant of the health status of both the mother and the foetus.

However, many pregnant women in developing countries, especially Ghana initiate their antenatal care late (after 12 weeks) thereby missing the benefits associated with antenatal care as some may be unable to attain the minimum visits of eight before delivery.

Objective: This study sought to determine the proportion of women who initiate ANC late, determine the mean gestational age at which pregnant women initiate ANC and to identify the factors influencing the initiation of ANC services at the Tamale Teaching Hospital and the Tamale Reproductive and Child Health Clinic.

Methodology: The study used a cross-sectional design with simple random sampling technique involving 206 women who were pregnant and initiated their antenatal care service at the Tamale Reproductive and Child Health Clinic and the Tamale Teaching Hospital. The tool for collection of data was a structured questionnaire. These data were analyzed with Stata version 15. Frequencies, chi-square test and logistic regression were used for the analysis

Results: The study found that, out of the sample of 206 women, 51% were within the ages of 25-34 years, slightly above half (51.9%) were Dagombas and 70.9% of the women also practice the Islamic faith. Those who were married also constituted the majority (52.4%), those who had senior high and tertiary education were also in the majority (55.8%) whiles 5 in 10 women were employed in the informal sector. Majority (61.7%) of the women were multiparous with 9 in 10 of their children being alive. About 70% of the women viewed the cost of transportation to the nearest ANC clinic as not costly whiles 7 in every 10 (69.9%) pregnant women initiated ANC

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after 12 weeks with the Mean and Standard Deviation of gestational age 19± 8.2 weeks. Multiple regression analysis indicates that ethnicity and client dissatisfaction were associated with late initiation of antenatal care service.

Conclusion: The study revealed that majority of pregnant women initiate antenatal care service late. The Mean and Standard Deviation of gestation at ANC initiation was 19 ± 8.2 weeks. Community-based education on the importance of early antenatal care could lead to early initiation of antenatal care services.

Keywords: Antenatal care, Timing of Antenatal, Pregnancy Outcomes, Late Initiation.

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LIST OF ACRONYMS

ANC	Antenatal Care
BANC	Basic Antenatal Care
CEMACH	Confidential Enquiry into Maternal and Child Health
DHIS	District Health Information System
EMOC	Emergency Obstetric Care
GDHS	Ghana Demographic and Health Survey
HIV	Human Immunodeficiency Virus
IQR	Inter Quartile Range
LMP	Last Menstrual Period
MMR	Maternal Mortality Rate
$PHCC_S$	Primary Health Care Centres
RCH	Reproductive and Child Health Clinic
SDGs	Sustainable Development Goals
SD	Standard Deviation
STD_S	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
T.T.H	Tamale Teaching Hospital
TV	Television

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UPTH	University of Port Harcourt Teaching Hospital
WHO	World Health Organization

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DEFINITION OF OPERATIONAL TERMS

ITEM	DEFINITIONS
Antenatal care	Refers to the regular medical care rendered to women during pregnancy
Early ANC Initiation	Antenatal care initiated on or before 12 weeks gestation
Gestation	Period of Pregnancy
Late Antenatal Care	Antenatal care initiated on or after 13 weeks of gestation
Last Menstrual Period	Is a way of estimating gestation using the date the individual starting her menses

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Antenatal care is defined as the care rendered by qualified health care personnel to a pregnant women for the purpose of assessing their general health status, providing continuous care and providing cure for diseases. This is done with the goal of preventing complications and death associated with pregnancy (Muhwava, Morojele, & London, 2016). According to Tran, Gottvall, Nguyen, Ascher, & Petzold (2012), antenatal care (ANC) visit talks of a visit to a health service provider for monitoring of one‟s pregnancy and not for the treatment of ill health.

Antenatal care is a key component towards morbidity and mortality reduction among pregnant women. This is realized by strictly adhering to standard treatment procedures delivered by well-trained health care personnel in the provision of care to women who are pregnant. It also affords women the chance of being provided with health education during pregnancy and also, vital information about possible dangers during pregnancy. Regardless of the enormous benefits associated with ANC, the Demographic and Health Survey (DHS) data reveals that majority of pregnant women in the developing world initiate ANC at health facility in the last trimester of their gestation (third trimester) with less than 30% of them missing out of the WHO target of eight minimum visits before delivery (Were et al., 2013; Ndidi, Oseremen, & Ebeigbe, 2010; Myer & Harrison, 2003).

According to Kisuule et al. (2013), women who seek maternal health care after twelve weeks of pregnancy will lose the privilege of a prompt diagnosis of existing illness such as HIV and STDs

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and malaria. They also lose the chance of early anaemia interventions, information on healthy living and providing cure for preexisting medical conditions.

The World Health Organization (WHO) aims at ensuring that all women pregnant and their foetus globally receives proper health service during the period of pregnancy, immediately after delivery and after 28 days post-delivery. As part of the continuous maternal health care needs, ANC serves as an avenue for essential service delivery including promoting healthy behaviours, assessing to detect abnormalities and providing the needed cure. Documentary evidence abounds to confirm that prompt initiation of maternal health care services result in neonatal survival and maternal wellness (WHO, 2016).

According to Abou-Zahr, Lidia, & Wardlaw Tessa M. (2003), ANC has other relevant components other than those related directly to the care of the pregnancy. As part of the package, ANC period presents as an avenue infections and malnutrition prevention in expectant mothers but this is usually under-utilized. These preventive package include malaria prevention, TB, malnutrition, and HIV/AIDS and other STIs prevention. Antenatal care can be a significant starting point for the provision of information regarding cross infection of HIV between women and their children. For malaria programmes, it is essential for women expecting their first child to seek for maternal health care in order to receive preventive treatment and advice on the use of bednets. These opportunities need to be utilized if antenatal care is to avoid being a period of missed opportunities.

A review by Hawkes, Gomez, & Broutet (2013), reported that prompt maternal health care initiation reduces the severity and morbidity due to syphilis infection. Women who initiate ANC before the third trimester of pregnancy and had the needed care stand a better chance of delivering a normal and healthy baby compared to those who sought care in the third trimester.

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Despite these numerous benefits associated with starting ANC early, and the possible risk of late initiation of ANC, women still initiate ANC late. This study seeks to examine the timing of ANC service initiation and associated factors among pregnant women in the Tamale Metropolis of the Northern part of Ghana. This findings from the study can add to the body of knowledge as well as lead to policy formulation and implementation for improved maternal and foetal well-being.

1.2 Problem Statement

According to the World Health Organization (WHO, 2016), a pregnant woman need to start antenatal care early in pregnancy in order to achieve at least eight contacts for a reduced undesired outcomes during labour and the postnatal period.

Ghana has a high ANC coverage together with skilled maternal health care service access at least once before delivery (Northern Regional Annual Report, 2016). Yet a high maternal mortality ratio of 319/100,000 still persist (Maternal Mortality Estimation Inter-Agency Group, 2015).

Statistics from the annual year report covering a period of four years (2012, 2013, 2014 and 2015) for the Northern Region indicates that the average ANC visit stagnated. Thus, the Northern Region recorded an average ANC attendance of 3.4 again for 2015 which is same as the value for 2014. This is below the national target of an average ANC visit of four. However, the average ANC visit for the Tamale Metropolis stood at 4.6 in the year 2015.

The proportion of clients who made at least four visits within the year under review decreased slightly from 62.5% in 2014 to 62.3% in 2015 whist the trend in the Tamale Metropolis is as follows: 60.1 in 2013, 70.9 in 2014 and 80.1 in 2015.

The Northern Region recorded a high (116.6%) ANC coverage in 2016. The 116% results from the fact that the expected deliveries (4% of the projected population) was less than the actual

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population that went to deliver in that year. With this high ANC service coverage, it was expected that most women would have initiated ANC early (on or before 12 weeks), but that is contrary in the report. Only 14.9% pregnant women initiated antenatal care in the 3rd trimester for 2016 compared to 15.4% in 2015 (Northern Region Annual Report, 2016).

The causes of the variation between high ANC coverage and third trimester registration of ANC could be due to ignorance of the importance of early initiation of maternal health care in affording pregnant women the chance of early diagnosis of HIV and STDs, malaria and anaemia prophylaxis, health education and treatment or prevention of complications. Cultural beliefs may also accounts for the variation. The consequences of the variation between high ANC attendance and late initiation has serious effects on maternal, foetal and pregnancy outcomes and could further derail the gains made in maternal mortality ratio of 146 per 100,000 live births in 2015.

The introduction of free maternal health care, the National Health Insurance Scheme and the building and expansion of health facilities were aimed at addressing financial constrains regarding ANC and availability of health facilities for uptake of ANC.

It‟s against this background that this study amidst interventions to address cost and availability was conducted to identify the factors associated with the timing of seeking ANC services by pregnant women in two health facilities in the Tamale Metropolis of the Northern part of Ghana.

1.3 Conceptual Framework: Andersen Model of Health Care Utilization

The conceptual framework used for this study was adapted from Andersen & Newman (1973). The model is a theoretical framework about health care services utilization comprising of three elements that interact to determine how health care services are utilized. The components of the model are health care service delivery system, societal determinants and the individual factors.

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The framework explains the influence of various factors on the timing of antenatal care services initiation. The decision of a woman to seek ANC services is shaped directly by the socioeconomic and demographic characteristics of the woman, health service related factors and environmental patterns. Socioeconomic and demographic factors such as age, education, religion parity marital status and occupation of woman and spouse leads to access and this then leads to ANC utilization. Health related factors such as resource availability, quality of service rendered, attitude of staff and cost of service provided also contribute to accessibility of ANC service and this results in the utilization of ANC service. Environmental patterns such as awareness of ANC, beliefs and distance to facility also works to create access which also results finally to service utilization.

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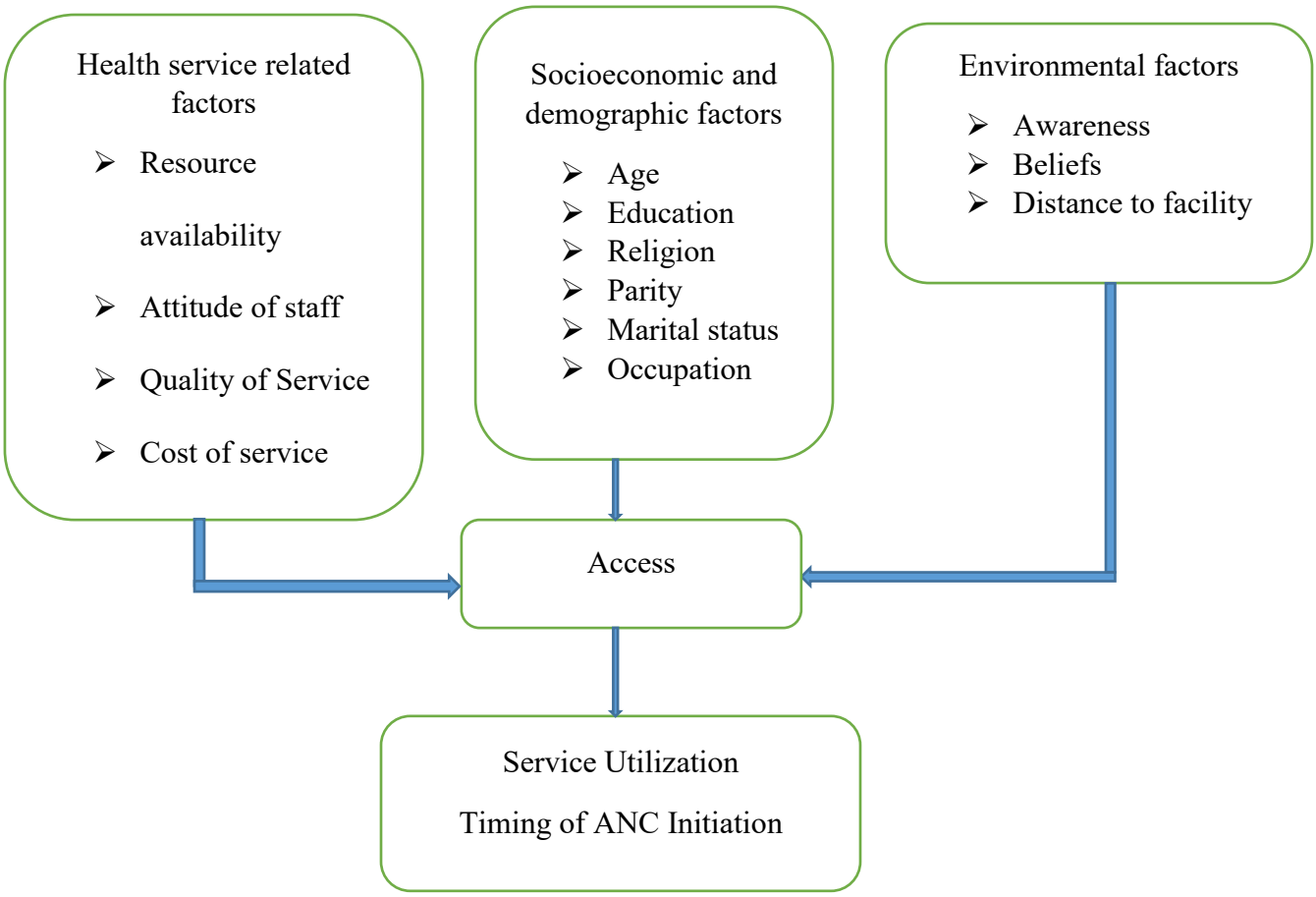

Figure 1.1: Conceptual Framework adopted from Andersen & Newman, (1973).

1.4 Justification of the Study

Antenatal care (ANC) is an essential element geared at improving the well-being of the mother and the newborn. Even more important to favorable pregnancy outcomes is early initiation of ANC services.

Early initiation of antenatal care services results in prompt recognition of undesired outcome during pregnancy. Findings from this study could therefore serve as a baseline information for

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further study on this topic in order to improve pregnancy outcomes and reduce both maternal mortality and morbidity as well as infant mortality and morbidity.

Similarly, findings from this research could also form the basis for policy formulation and implementation to achieve good pregnancy outcomes and reduce both infant mortality and maternal mortality. It could also serve to bridge the gap in knowledge as far as late initiation of antenatal care service is concerned.

1.5 Objectives of the Study

1.5.1 General Objective

To examine the timing of antenatal care service initiation and associated factors among pregnant women in the Tamale Metropolis of the Northern part of Ghana.

1.5.2 Specific Objectives

1. To determine the proportion of pregnant women who initiate ANC.
2. To determine the mean gestational age at which pregnant women initiate ANC services.
3. To identify the factors influencing initiation of ANC service.

1.6 Research Questions

1. What proportion of pregnant women initiates ANC?
2. What is the average gestational age at ANC initiation?
3. What are the factors influencing initiation of ANC services?

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CHAPTER TWO

2.0 LITERATURE REVIEW

The chapter discusses the available literature on the factors influencing the timing of Antenatal Care (ANC) services initiation in general by looking at various literature with regards to the topic of this research. The review of literature is centered on the following:

- Issues relating to the timing of ANC service initiation
- Factors associated with the timing of Antenatal Care (ANC) services initiation
  - Socioeconomic and demographic factors
  - Health-service related factors
  - Environmental factors

2.1 Issues on the Timing of Antenatal Care (ANC) Service Initiation

Starting antenatal care (ANC) service at or before 12 weeks of gestation is crucial for prompt diagnosis and provision of care during undesired gestational related outcomes. The provision of this type of service for pregnant women is an essential component in the safe motherhood programme, as the ultimate goal aims at an improved pregnancy outcome for both the mother and the foetus (Jeremiah, Orazulike, & Korubo, 2015).

In a South African study, the outcome variable is the time of ANC initiation (early versus late ANC initiation) during the last pregnancy. In that study, antenatal care service refers to seeking health at a clinic or hospital for the purpose of monitoring and ensuring good health of the pregnant woman. Timing of ANC initiation is referred to as the beginning of antenatal care. Early registration means seeking the initial care before 17 weeks of pregnancy. This is the

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prescription for seeking health care during pregnancy for women in the Sub-Saharan African countries (Villar et al., 2001).

Services provided during pregnancy (ANC) is among the prescribed measures with a goal of ensuring that both the woman and her baby maintain good health worldwide. This is essential for the expectant mother and includes a variety of activities with huge potential benefits for positive pregnancy outcomes. However, large proportions of women do not initiate ANC early resulting in undesired pregnancy outcomes (Aliyu & Dahiru, 2017). A healthy population according to Berkley et al., (2013) is a prerequisite for development.

Antenatal care presents an opportunity for the provision of care for a better nutritional status of pregnant women, provision of information regarding health, and encouraging women to be attended to by trained persons during labour at facilities providing emergency obstetric care (EMOC). These measures will result in an improved health condition of the women as well as reduce neonatal and infant morbidity and mortality. With an increasing infection with HIV globally, antenatal care also provides a better chance for HIV testing and counseling and therefore has the likelihood of preventing HIV spread from mother to child. The provision of prophylactic treatment for malaria during pregnancy results in good health of the woman and her unborn child (Wang, Alva, Wang, & Fort, 2011).

Studies have attributed the high death rate among women, neonates and children to insufficient and low standard of care during pregnancy, labour and puerperium (Carroli, Rooney, & Villar 2001).

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With a better comprehension of the need for expectant mothers to holistically prepare towards delivery, seeking health care during pregnancy is crucial for better pregnancy outcomes for both the mother and child (Carroli et al., 2001).

Beginning antenatal early leads to precise dating of pregnancy, especially in women who are uncertain of the day they started their menstruation. Similarly, it aids early documentation of the woman's baseline physiological and laboratory parameters for subsequent comparison and early detection of anomalies with the progress of pregnancy. It opens avenues for offering health education and preventive health care services such as immunization against neonatal tetanus, prophylactic treatment of malaria through the use of intermittent presumptive treatment approach, and human immunodeficiency virus (HIV) counselling and testing. Another advantage is the early detection of modifiable pre-existing medical conditions that may influence the course and outcome of pregnancy such as cervical incompetence, chronic hypertension and diabetes mellitus. Those who do not register for antenatal care or those who register for it late may not benefit from the wide opportunities accruing from it and consequently may have worse maternal and perinatal pregnancy outcomes (Milne et al., 2005).

Late ANC booking is a normal event amongst many developing countries in the Sub-Region of Africa regardless of the associated benefits of attending or initiating ANC before 13 weeks of pregnancy. Inconsistent or absent health care seeking behavior is identified as major cause of mortality among women in South Africa. Even though countries in the Sub-Region dictates that seeking health care during pregnancy should commence early, this prescription has been ignored in many countries including South Africa (Muhwava et al., 2016).

According to Hoque, Hoque, & Kader (2008), less than 10% of women from South Africa who are pregnant initiate ANC during the early period of pregnancy whiles majority seek health care

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after the first trimester of pregnancy. Taking detailed information about the woman as well as documenting their haemoglobin (Hb) level is done for all pregnant women at ANC initiation (Joshi, Torvaldsen, Hodgson, & Hayen 2014).

Around one-third of the Saudi Arabian studied pregnant women were attending the primary health care centres (PHCCs) during the first trimester. The early initiation of ANC is important to prevent and treat anaemia as well as diagnose and care for women with medical condition (Habib & Hanafi, 2011).

The World Health Organization (WHO) prescribes that, the lowest number of visits a woman pregnant should make to a health facility should be four (Villar et al., 2001). The WHO new directives for care during pregnancy include a minimum of eight visits, blood pressure monitoring, assessing the urine for infections and protein as well as blood analysis for diagnosing syphilis and severe anaemia (WHO, 2016). Other components of care for pregnant women including administering tetanus injections, boosting her haemoglobin level with haematinics and the making of health information about manifestations in pregnancy that call for urgent health care attention available. This is necessary for the wellbeing of the mother and the neonate (Wang et al., 2011). Infected syphilis women in pregnancy who do not seek treatment have 70%-100% rate of transmission to their children as well as giving birth to lifeless babies (Rogers, Fowler, & Lindegren 2018).

In order to have enough time to diagnose and provide care in conditions like anaemia and infections, expectant mothers are offered advice to seek care as quick as possible. In the Western world, out of the women who attend antenatal care, most of them have their first antenatal contact in the first trimester of pregnancy. In Jordan for example, majority of women start antenatal care in the early part of their pregnancy. In other countries like India, Indonesia, the

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Philippines and Vietnam, majority of women seeking care in pregnancy do it early. Indonesia has the highest percentage; 79 percent of women reported that they had their antenatal care visit within the first trimester of pregnancy. In the other four countries of the region, however, less than half of women with any antenatal care reported starting care in the first trimester.

Even though a greater proportion of mother in the developing world seek ANC when they are pregnant, most of them delay in seeking the health care till the last two trimesters of gestation. Other countries such as Malawi had 95 percent of their women reporting at least one antenatal care visit, less than 10 percent reported making the first visit in the first three months of pregnancy. In Senegal, the finding is even more striking. Although 91 percent of women make at least one antenatal care visit, 43 percent of them wait until the third trimester to start care. Even where a high proportion of women reported four or more antenatal care visits, as in Namibia and Zimbabwe, at about 70 percent, only 34 percent in Namibia and 29 percent in Zimbabwe reported making the first antenatal care visit in the first trimester (Wang et al., 2011).

Conclusions arrived in a study conducted in South Africa show that most of the pregnant come for ANC often but conversely, majority of them start their service for ANC after 16 weeks of gestation. The DHIS data for 2011 indicates that late ANC initiation remains a big challenge to women wellbeing in South Africa as only less than 40% and majority of pregnant women in Gauteng and Western Cape respectively initiate ANC before 20 weeks (Muhwava et al., 2016).

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2.2 Factors Associated with the Timing of Antenatal Care (ANC) Initiation.

2.2.1 Socioeconomic and Demographic Factors

Sociodemographic factors including age, level of education, religion, marital status and occupation of women turn to influence ANC attendance. Results from Habib & Hanafi (2011), indicates that three-quarters (41.4%) of pregnant women attending ANC had secondary education whist those with university education constituted 33.2%. Partner higher education, employed women and desirability of pregnancy increases early initiation and frequency of ANC service (Muhwava et al., 2016). These findings are in sharp contrast to a study in the same country Nigeria in the Niger Delta state where a similar research reveals a lack of association between socio-demographic factors and late start of ANC (Ebeigbe & Igberase, 2005).

Level of women education, the extent to which they listen to radio and television, their geographical location were found to be accounting for seeking care in pregnancy late in Nigeria. It therefore meant that providing female education, providing free health care services may result in an increased uptake of services with its product being improved wellness of women and their babies (Aliyu & Dahiru, 2017). Contrary to this study by Aliyu et al., (2017), age of a woman together with her level of educational was found not to predict the gestational age at booking according to Jeremiah, Orazulike, & Korubo (2015) in study at the University of Port Harcourt Teaching Hospital, Nigeria.

Results from a study conducted by Aliyu & Dahiru (2017) indicates on a whole that more than 60% of expectant mothers seek health care late during pregnancy. Against the background of socio-demographic factors, only marital status and pregnancy intention were not significantly different with respect to initiation of ANC within the three periods of pregnancy. There appears to be a clear pattern of timing of ANC (in the first trimester) with respect to maternal level of

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education, household wealth level, level of participation in decision-making and level of media exposure. That is, the more educated the woman is, the greater her chance of seeking maternal care promptly. Similarly, more women in the rich household (29%) initiated maternal care earlier than those who are financially constrained. There is also a clear incremental pattern in the initiation of ANC based on the level of involvement in household decision making.

In a study undertaken in a tertiary health care facility in Nigeria, it was revealed that women who planned for their conceptions stands a greater chance of initiating their maternal health care early (14 weeks and below) as compared to women who did not planned their pregnancies (Jeremiah et al., 2015).

In a study conducted in Nigeria by Jeremiah et al., (2015), a conclusion was arrived that poverty was a determinant of late booking of ANC by most pregnant women.

In another study by Adamu & Salihu (2002), major of barriers identified to prevent women use of ANC were economic, cultural and those related to the women‟s perception of their condition and recommended that poverty reduction and economic empowerment of rural women were prerequisites for any tangible improvement in the utilization of antenatal care and obstetric delivery services.

In another study done in Nigeria, Port Harcourt by Jeremiah et al., (2015) the study found that most of the women booked for antenatal care after the first trimester of pregnancy as a result of financial constraints.

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2.2.2 Environmental Factors

Factors within a pregnant woman‟s environment such as the distance between the residence and the facility, individual or community beliefs and her awareness of the ANC service go a long way to affect either positively or negatively the timing of ANC service initiation.

Findings from Van Eijk et al., (2006) from rural Kenya, show that one‟s innate drive for ANC uptake is a motivator for initiating ANC service which may be occasioned by knowledge exposure through the media. Another study conducted by Manzi et al., (2014), found a weekly exposure to either a TV or radio as an essential determinant for early initiation of antenatal care service.

Findings from another study also reveals that more than half of mothers lacks basic knowledge pertaining to their monthly flow of blood depicting ignorance of their reproduction (Gross, Alba, Glass, Schellenberg, & Obrist, 2012). Providing information regarding women reproductive health has shown to contribute to the wellbeing of women and resulted in a better and early uptake of antenatal service (Kisuule et al., 2013). Family bonding also enhances the woman‟s chances of seeking ANC services as this exposes her to a variety of ideas and also opens her to information about providers (Simkhada et al., 2008). Similarly, a systemic review of qualitative data on marginalized women access to ANC concluded that attitudes from close relations are very influential in determining whether a female in the reproductive age group concedes a conception. Anxiety relative to family rejection of pregnancy as well as social exclusion by age mates were identified as true determinants of delayed maternal health care service (Downe, Finlayson, Walsh, & Lavender, 2009).

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The distance between an individual woman‟s home and the ANC delivery facility was directly linked with ANC utilization (Magadi et al., 2000, Glei et al., 2003). The closer a woman to the health facility, the higher the frequency of attendance (Glei et al., 2003).

2.2.3 Health Service Related Factors

The facility within which ANC services are rendered is a key pull or push factor to early ANC uptake. Various factors within the health service delivery which includes availability of drugs and supplies, availability of human resource and their attitudes and the privacy of clients at the facility turns to dictate either early or late uptake of ANC service. In a Zambian study, proximity to care together with the availability of transportation was seen as the most frequent reason for not seeking ANC services (Van Eijk et al., 2006). According to a study conducted in Port Harcourt Teaching Hospital Nigeria by Jeremiah, Orazulike, & Korubo (2015), distance of residence from the hospital was found to influence the age of the pregnancy at which the woman will book for ANC, as those living far away from the antenatal service delivery facility had a greater chance of utilizing health care services late.

According to Audo, Ferguson & Njoroge (2005), provision of standard health care services results in the uptake of both maternal and child health services. The major justifications for not utilizing the nearest health facility were dissatisfactory service, absence of drugs and supplies and absence of/unsatisfactory diagnostic services.

To further put premium on standard of care rendered at ANC, Simkhada et al., (2008) pointed in out their systemic review of papers on “Factors affecting the utilization of antenatal care in developing countries” that the starting time for the delivery of service was of value to urban slum-dwelling women in Bangladesh, whereas delayed service provision was a hindrance to the utilization of ANC services.

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Simkhada et al., (2008) in their systemic review of literature identified good financial purchasing power as associated with early initiation of service. Inability to pay for the cost of health care during pregnancy, restricts the use of maternal health care. The costs of the service including transportation and necessary laboratory tests were major factors prohibiting service utilization. This was further collaborated in a qualitative study by Magadi et al., (2000).

Women who thought ANC from private hospitals provided better health care services were unable to initiate health care due to the increased cost of services while free or subsidized services improved uptake of ANC among urban slum-dwelling women (Simkhada et al.,2008).

Accessibility to a health facility was an influential factor for ANC utilization which mainly was due to place of residence, distance and transport to the healthcare facilities. Women in urban areas used ANC more than rural women. Women living in cities utilized health care compared to mothers in villages. In contrast, women in urban areas of Karnataka in India were about 45% less likely to receive ANC than those living in rural areas. There was no statistically significant difference between urban and slum areas regarding utilization of ANC in Pakistan (Simkhada et al., 2008).

Qualitative studies found that long distance to a health facility or difficult access to a facility were challenges to early ANC service initiation. A qualitative study reported that bad transport, bad road network and restrictions from rivers were challenges to service utilization rural Zimbabwe (Mathole, Lindmark, Majoko, & Ahlberg, 2004).

The variations in outcomes of various literatures pertaining to the factors associated with the timing of ANC could be due to the differences in sites and locations of the various studies, the type of study, the methodology used, the sampling procedure as well as the data analysis method.

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My study findings I believe may concur with some previous findings in literature as well as providing additional knowledge or dimension to already existing knowledge.

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CHAPTER THREE

3.0 METHODOLOGY

This chapter provides the various methods employed in this study and further describes the study design, study area, sampling method, study procedures, data collection tools and instrument, data analysis as well as ethical considerations.

3.1 Study Design

This study was a cross-sectional quantitative study involving 206 pregnant women seeking antenatal care services for the first time at the Tamale Reproductive and Child Health Clinic and the Tamale Teaching Hospital all in the Northern Regional capital of Ghana.

3.2 Study Area

This study was conducted in two health facilities in the Tamale Metropolis, namely the Tamale Teaching Hospital and the Tamale Reproductive and Child Health Clinic. The Tamale Teaching Hospital is the only tertiary health facility in the Northern region of Ghana. It is the training hospital for medical students from the University for Development studies (UDS) which is located on the Tamale Yendi road directly opposite Kukuo.

The 380 bed capacity health facility renders specialist health services in the following areas: Obstetrics & Gynaecology, Surgery, Orthopaedics & Trauma, Internal Medicine, Child Health, Pathology, Ear, Nose and Throat (ENT), Endoscopy, Neurosurgery, Anaesthesia and Intensive Care Unit, Psychiatry, Dentistry and an Eye Unit. The Tamale Teaching Hospital is accredited by National Health Insurance Authority.

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Even though a tertiary institution, the hospital still provides health services to the people of Tamale and the region as a whole without referrals in all the specialties including antenatal and postnatal care services. The institution provides ANC and PNC services on week days from 8:00am to 5:00pm.

The Tamale Reproductive and Child Health Clinic on the other hand is also located on the Tamale Yendi road and directly opposite the main branch of the National Investment. The clinic is about 150 meters away from the Tamale Jubilee Park. The facility runs only out-patient services which includes Post-natal and Antenatal services. The facility unlike T.T.H., provides only ANC and PNC services and functions on only week days from 8:00am to 5:00pm.

3.3 The Study Population

This study involved pregnant women initiating ANC services at the time of the data collection at the Tamale Teaching Hospital and the Tamale Reproductive and Child Health Clinic.

3.3.1 Inclusion Criteria

- All pregnant women booking for antenatal care service for the first time at the Reproductive and Child Health Clinic and the Tamale Teaching Hospital.
- Pregnant women who have stayed in Tamale for at least 6 months.
- Pregnant women who could speak either English, Dagbani or Twi.
- Pregnant women aged between 15 and 49 years.

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3.3.2 Exclusion Criteria

These pregnant women were excluded from the study;

- ❖ All pregnant women who have emergency medical conditions.
- ❖ Pregnant women who refused to give their voluntary consent to participate in the study.

3.4 Variables

3.4.1 Outcome Variable

The main outcome variable is timing of ANC initiation

Table 1: Outcome Variable

Outcome variable	**Definition**	**Variable Type**
Timing of ANC initiation	Gestational age at which a woman began ANC services Early initiation: Registration for ANC services at or before 12 weeks gestation. Late initiation: Registration for ANC services at or after 13 weeks gestation.	Categorical

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3.4.2 Explanatory Variables

The explanatory variables include those in table two, three and four.

Table 2: Socio-Economic and Demographic Factors Associated with the Timing of ANC Service Initiation

Socio-demographic and economic Factors	Definition	Variable Type
Age	Age at last birthday at the time of registration for ANC services.	Discrete
Gravidity	Being pregnant	Discrete
Parity	Number of children a women has given birth to, either alive or dead.	Discrete
Marital status	Whether client has a husband or not.	Nominal
Educational level	Highest educational level at the time of registration	Ordinal
0ccupation	The work the patient does to earn a living	Nominal
Religion	Beliefs and worship	Nominal
Ethnicity	One‟s distinct cultural trait as belonging to a group in a society	Nominal

Table 3: Environmental Factors Associated with the Timing of ANC Services Initiation

Factor	Definition	Type of variable
Distance	Patients perceived proximity to the ANC clinic	Ordinal
Beliefs	Faith in God or gods as pertains to cultural acceptance of ANC services	Nominal

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Table 4: Health Related Factors Associated with the Timing of ANC Service Initiation

Factor	Definition	Type of variable
Resource availability	Presence of human and material resources	Nominal
Quality of service	Standard maintained in service delivery	Ordinal
Attitude of staff	Behaviour of all category of nurses	Ordinal
Cost of Service	Amount paid for services	Ordinal

3.5. Sample Size Calculation

The minimum sample size required for this quantitative study was computed using the Cochran equation as follows:

- $n = \frac{z^2 * p * q}{e^2}$

Where:

- n = sample size
- z = standard deviation at 95% confidence interval (standard value = 1.96)
- p = estimated proportion of clients with late uptake of ANC services is 15% totaling 18955 clients.
- e = desired precision (5% or 0.05)
- q = 1-p

The proportion of pregnant women who booked for ANC services after 13 weeks gestation was 14.9% (Northern Regional Annual Report, 2016.). Furthermore, a 5% precision was assumed. Thus, substituting these parameters in the formula, the sample size was computed as follows:-

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- $n = \frac{\left(1.96^2 * 0.15 * (1-0.15)\right)}{0.05^2}$

- $n = 196$

3.6 Sample Size Adjustment

The sample size is therefore 196 respondents. To cater for non-response and data entry errors, the sample size will however be increased by 5%.

- $= 0.05 * 196 = 9.8$ which will be rounded down to 10. The final sample size therefore, $= 196 + 10 = 206$.

Therefore the final sample size is 206.

3.7 Sampling Procedure

In the selection of the two facilities (T.T.H. and RCH), a simple random sampling technique was employed. This was done by grouping all government owned health facilities into two, hospitals and clinics. The hospitals are those facilities that renders both ANC and other medical or surgical care. The clinics on the other hand are those that renders only ANC services.

A selection was made from each of the two groupings by writing the names of the facilities on pieces of paper. Pieces of paper were placed in a container, closed and vigorously shaken. One paper was then selected randomly from the hospitals (T.T.H). The same procedure was repeated to select the clinics (RCH). The sample size of 206 was proportionally shared among them in a ratio of 2 for hospital and 1 for clinics using their respective monthly average attendance of 200 for T.T.H and 100 for RCH.

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Proportionate sample size of 137 was arrived for T.T.H and 69 for RCH. For T.T.H., selection of participants was done by dividing the sample size of 137 over the period of data collection (10 days) to obtain the average daily participants of 14 with 20 expected daily booking. A total of 20 yes and no written on pieces of paper comprising of 14 yes and 6 no was placed in a container and closed for new registrants to select. Those who selected yes were included in the study and those with the no excluded.

For RCH with a sample size of 69, this was also divided over the period for the data collection (10 days) to obtain an average daily participant of 7. With an average daily new registrants of 14, a total of 14 yes and no comprising 7 yes and 7 no was as well placed in a container for new registrants to select. Selection of a yes means inclusion in the study and no excluded one from the study.

3.8 Training of Research Assistants

A two-day training was given to four (4) research assistants on data collection. The training involved lectures, discussions and role playing. The purpose was to ensure a clear understanding of the research topic as well as ensuring that they were effectively equipped in all aspects of the study including the field work. The scope of their training included:

- The study topic, its background and objectives.
- The method of sampling participants.
- The need to obtain informed consent and ensure confidentiality at all times throughout the study.

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3.9 Pre-Testing of Questionnaire

The developed research tool (questionnaire) was pretested in the antenatal care unit of Tamale West Hospital which is about 5 kilometres away from T.T.H. The pretest was done with the aim of ensuring feasibility, validity and reliability of the instrument. Simple random sampling technique was used to select ten participants to answer the questionnaire.

3.10 Data Collection Method

The interviewer-administered questionnaire was employed to obtain quantitative data from the pregnant women. The data collection tool was made-up of both opened and closed ended questions. The data collection took place from the 4th to 15th of June, 2018. The questionnaire (Appendix II) was administered by four (4) research assistants who were trained within two days in data collection. Questionnaire was structured to elicit information on (A) socio-demographic characteristics, (B) environmental factors, (C) facility related factors and (D) access factors. The questions were extracted from previous related studies conducted in other developing countries while some of the questions were also developed from literature by the researcher. The language used for questionnaire (Appendix II) design was English and the administration was done in English, Dagbani and Twi.

3.11 Data Processing

Data collected were inspected for completeness and assessed for quality. This was done through checking the filled questionnaire for omissions and consistency to ensure integrity. Data entry sheet was designed using SPSS with appropriate variable definitions to minimize error during the data entry. The final data was then double entered to detect any discrepancies for the necessary

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correction and accuracy. The data were then finally entered into SPSS version 21 before exporting to Stata 15.0 for final analysis.

3.12 Data Analysis

The data collected were assessed for quality through checking the completed questionnaires to ensure completeness and consistency in order to improve data quality before the final data set were generated. The outcome variable timing of ANC initiation, which was categorized into early initiation (initiation on or before 12 weeks) and late initiation (initiation on or after 13 weeks) were coded zero for early and one for late initiation. The independent variables with yes and no responses were also coded zero for no and one for yes. Other independent variables were also coded from one to the last option. Afterwards the data were entered into SPSS version 21 and same exported to version 15.0 of the Stata software.

The exported data were then statistically analyzed using the Stata version 15.0 software. The analysis of the data was done in three (3) stages;

- The first stage of the data analysis involved descriptive statistics where bar charts, pie charts and tables were used to depict frequencies, proportions and percentages of collected data. Mean and median were used to summarize continuous data such as age of women and gestational age.
- Proportions together with 95% confidence intervals were used to determine the proportion of women who initiated late for ANC against those that initiated early.
- Chi square tests of associations were performed to determine the association between the main outcome variable (late ANC) and the explanatory variables.
- Fischer‟s exact tests were used where the values in the cells were below 5.

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- The second stage of the data analysis involved a bivariate analysis of the data collected. The dependent variable; late initiation of ANC, was ran against each independent variables to test the association between them using a simple regression test. The independent variable(s) that showed association with the dependent variable (0.05 p-value) were then analyzed at the multivariate analysis stage.
- The last and final data analysis was done at the multivariate analysis. Here, two or more independent variables that had a p-value of 0.05 at the bivariate analysis was combined and ran against the dependent variable to determine an association at this stage. Variable(s) that showed a p-value of 0.05 amidst other independent variables were then the true or predictor variable(s).

3.13 Ethical Considerations

The following ethical issues were considered during the study to ensure the rights and dignity of the participants were protected.

1. Ethical clearance was obtained from the Ghana Health service Ethical Review Committee with **ID NO: GHS-ERC 044/01/18** (Appendix IV)
2. Introductory letters from the department of Population Family and Reproductive Health (University of Ghana) were sent to the heads of the two health facilities.
3. Permission was further sought from the regional health directorate for Ghana Health Service, Northern region Tamale and the management of both Tamale Teaching Hospital and the Reproductive and Child Health clinic.
4. Informed consent was obtained from participants (Appendix II).
5. Participants were assured of confidentiality, privacy and anonymity (Appendix I) although the results of the study will be published in the course of the research. This

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means that no reference would be made to the name of participants in the research report. Moreover, no other person will have access to the data involved in the study.

6. Participants were informed duly about the discomfort and risks in this study (Appendix I).

7. The interviews were voluntary and no one was coerced to participate in this study.

8. All electronic data involved in the study were stored in a computer and backed on an external hard drive with password protected. The hard copies of data are stored and locked in a safe place with limited access to the principal investigator alone.

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3.14 Quality Control

To ensure and achieve data reliability, the following quality control measures were adopted;

- Four female research assistants were trained for two days prior to the pre-testing and final administration of the questionnaire. The questionnaire covered the various specific objectives under the study.

- The training ensured clear understanding of the research topic, objectives and the need for confidentiality.

- The training also helped equip them with the skills and ability to effectively administer the questionnaires.

- Meetings were then held daily after the data collection to identify challenges, and solutions to the challenges were offered to the team.

3.15 Dissemination of Findings

The study findings will be disseminated and copies will be made available to the following groups;

- School of Public Health library, University of Ghana
- Main library, University of Ghana
- The two health facilities where the study was conducted.
- Publication in a scientific journal

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CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the results obtained from the data analysis. The socio-demographic information of the respondents is presented first. The various results aimed at addressing the study objectives are presented subsequently. A total of 206 questionnaires were administered to pregnant women initiating Antenatal care at Tamale Teaching Hospital and Tamale Reproductive and Child Health Clinic.

4.2 Socio-Demographic Characteristics of Pregnant Women

The total participants of the study was 206 pregnant women. One hundred and five (51%) of the women were aged between 25 and 34 years. The median and Inter quartile range ages of the participants was 26 and 27 years respectively. A little above half of the participants were from the Dagomba ethnic group 107 (51.9%) with Islam being the dominant religious denomination 146 (70.9%). Married women also constituted a little above half (52.4%) of the study population with the highest 63 (30.6%) proportion of pregnant women attaining Senior high school level education. Women who have given birth before represented a 61.7%, while the proportion of women with children who are alive represented 60.7% of the participants who have delivered. About seven in ten (73%) of all participants viewed attending the nearest ANC as not being costly whiles another 1 in 5 (17.5%) of the study participant were employed in the formal sector and a little over half (51.9%) employed in the informal sector as indicate in Table 4.1 below.

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Table 4.1: Socio-Demographic Characteristics of Study Respondents who Initiated ANC Services

Characteristics of respondents	Freq.	Percent
Age category *(Median (IQR))*	26 (27)	
17-24 years	79	38.35
25-34 years	105	50.97
35-44 years	22	10.68
Ethnicity		
Dagomba	107	51.94
Gonja	16	7.77
Mamprusi	11	5.34
Akan	18	8.74
Frafra and others	54	26.21
Religious affiliation		
Muslim	146	70.87
Christian	59	28.64
Traditionalist	1	0.49
Marital Status		
Single	17	8.25
Married	108	52.43
Cohabiting	81	39.32
Education level		
None	51	24.76
Basic	40	19.42
Senior High School	63	30.58
Tertiary	52	25.24
Occupation		
Unemployed	63	30.58
Employed Formal sector	36	17.48
Employed Informal sector	107	51.94
Parity		
Never	79	38.35
Ever	127	61.65
Children Alive [p]		
Not Alive	2	1.57
Alive	125	98.43
Cost of Attending Nearest ANC		
Not costly	127	72.99
Costly	47	27.01

IQR: lnter quartile range. [P]: Frequency and proportion is among those who have ever given birth

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4.3 Proportion of Women Initiating Antenatal Care Services

The report showed that, of the 206 women who took part in this study, majority (69.9%) initiated ANC service late (95%; CI: 64-76) while the remaining (30.1%) initiated ANC services early (95%; CI: 23.9-36.9).

4.4 Gestational Age of Pregnant Women at ANC Initiation

From the study, pregnant women in their second trimester recorded the highest percentage of late initiation of ANC. That is, 4 in every 10 (42.7%) pregnant women commenced antenatal care services in the second trimester, whilst 3 in 10 (30.1%) women started attendance in the first trimester and an almost 3 in every 10 (27.2%) pregnant women initiated ANC in the last trimester of their pregnancy. The mean and standard deviation of gestation at ANC initiation was 19.0 and 8.2 weeks. This is shown in Figure 3 below.

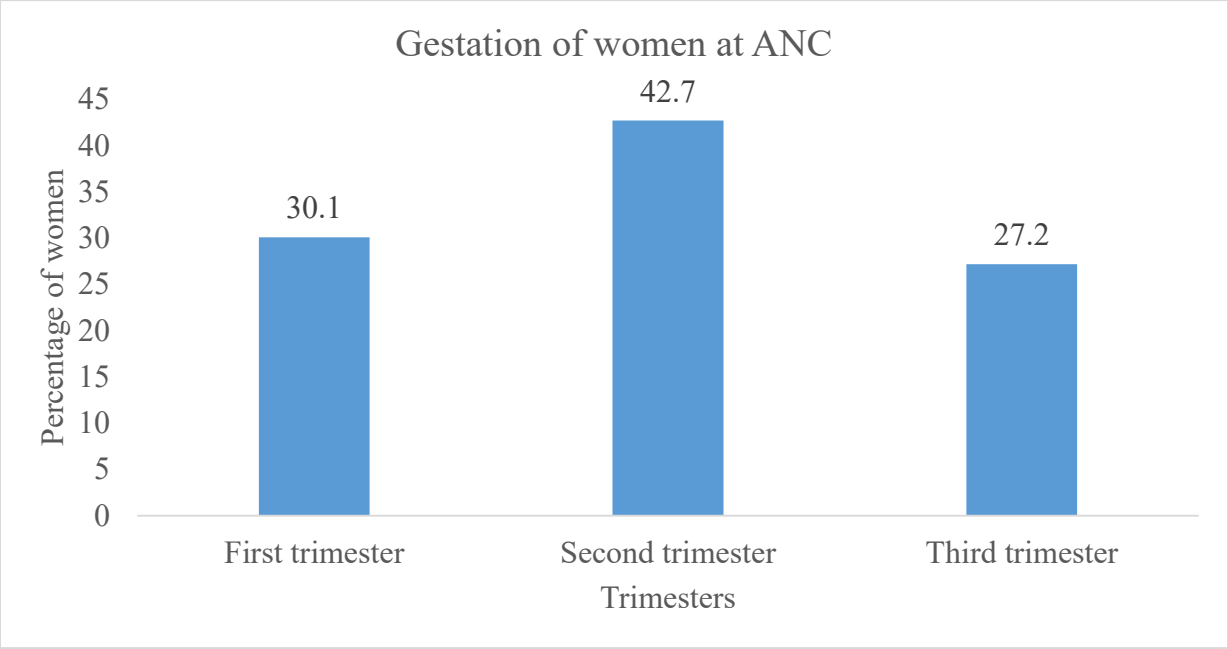

Figure 2: Gestational Age at ANC Initiation

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4.5 Association between Socio-Demographic Factors and Timing of ANC Initiation

The bivariate analysis of the socio-demographic characteristics of pregnant women and the factors influencing their initiation of ANC is presented in Table 4.2 and 4.3. A strong evidence of association was found between the ethnicity of pregnant women and late ANC initiation ($\chi^2 = 19.00, p < 0.001$). Other factors that were associated with late initiation of ANC included religious affiliation of respondents ($\chi^2 = 9.17, p = 0.002$), marital status of pregnant women ($\chi^2 = 7.59, p = 0.022$) as well as the perception of quality of ANC by pregnant women ($\chi^2 = 4.52, p = 0.033$). On the other hand, the following characteristics of respondents showed no evidence of association between late ANC initiation (age, education, occupation, parity, gravidity, cultural support for ANC, presence of ANC in locality, cost of transportation to the nearest ANC, perception of ANC to be free among others).

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Table 4.2: Association between Socio-Demographic Characteristics and Time of ANC Initiation

Variable	Early N (%)	Late N (%)	Chi Square	P-value
Age category (*years*)			2.04	0.36
17-24	23 (29.1)	56 (70.9)		
25-34	35 (33.3)	70 (66.7)		
35-44	4 (18.2)	18 (81.8)		
Religion			9.17	0.002**
Muslim	53 (36.3)	93 (63.7)		
Christian	9 (15.0)	51 (85.0)		
Ethnicity			19.00	0.001***
Dagbani	46 (43.0)	61 (57.0)		
Gonja/other northern tribes	11 (13.6)	70 (86.4)		
Southern tribes	5 (27.8)	13 (72.2)		
Marital status			7.59	0.022*
Single	2 (11.8)	15 (88.2)		
Married	41 (38.0)	67 (62.0)		
Cohabiting	19 (23.5)	62 (76.5)		
Education level.			1.94	0.586
None	14 (27.5)	37 (72.5)		
Basic	15 (37.5)	25 (62.5)		
Senior high school	20 (31.7)	43 (68.3)		
Tertiary	13 (25.0)	39 (75.0)		
Occupation.			1.40	0.496
Unemployed	21 (33.3)	42 (66.7)		
Formal sector	8 (22.2)	28 (77.8)		
Informal sector	33 (30.8)	74 (69.2)		
Parity			2.23	0.136
Never	19 (24.1)	60 (75.9)		
Ever	43 (33.9)	84 (66.1)		
Gravidity			2.08	0.149
Multigravida	44 (33.6)	87 (66.4)		
Prim gravida	18 (24.0)	57(76.0)		
Culture support for ANC			0.38	0.537
No	1 (50.0)	1 (50.0)		
Yes	61 (30.0)	143 (70.0)		
Client satisfaction			5.55	0.019 *
Satisfied	48 (35.6)	87 (64.4)		
Dissatisfied	14 (19.7)	57 (80.3)		

N: cell frequency. %: row percentage. *: p <0.05. **: p <0.01. ***: p <0.001

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Table 4.3: Association between other Factors and the Timing of ANC Initiation

Variable	Early N (%)	Late N (%)	Chi Square	P-value
Delay of ANC by unsatisfactory service			14.64	0.001***
No	33 (47.2)	37 (52.8)		
Yes	29 (21.3)	107 (78.7)		
Place of service delivery			0.24	0.626
Private place	56 (29.6)	133 (70.4)		
Open place	6 (35.3)	11 (64.7)		
Address by Nurses/Midwives			8.20	0.017*
By your name	61(33.4)	122 (66.6)		
Other address.	1 (4.4)	22 (95.6)		
Perception about quality of ANC			4.52	0.033*
Good	55 (33.5)	109 (66.5)		
Not good	7 (16.7)	35 (83.3)		
ANC in locality			1.96	0.162
No	24 (25.3)	71 (74.7)		
Yes	38 (34.2)	73 (65.8)		
Transport to ANC in locality			0.62	0.732
By foot	14 (35.0)	26 (65.0)		
By personal transport	14 (30.4)	32 (69.6)		
By public transport	11 (39.3)	17 (60.7)		
Access to nearest ANC			3.24	0.197
By foot	8 (38.1)	13 (61.9)		
By personal transport	20 (28.2)	51 (71.8)		
By public transport	20 (20.6)	77 (79.4)		
Cost to nearest ANC			1.53	0.216
Not costly	33 (26.0)	94 (74.0)		
Costly	8 (17.0)	39 (83.0)		
Perception of ANC to be free			2.35	0.125
No	40 (27.0)	108 (73.0)		
Yes	22 (37.9)	36 (62.1)		

N: cell frequency. %: row percentage. *: p <0.05. **: p <0.01. ***: p <0.001

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4.6 Binary Logistic Model

The various factors that influenced the time pregnant women initiate ANC visits at the Tamale Teaching Hospital (T.T.H) and the Tamale Reproductive Health clinic is presented in Table 4.4 and 4.5 with odds ratios, 95% confidence intervals and p-values from the simple and multiple binary logistics regression.

From the logistic model, the odds of pregnant women from the Gonja & other Northern ethnic group initiating ANC late was significantly higher compared to pregnant women from the Dagomba ethnic group in both the simple (UOR: 4.8, 95% CI: 2.28-10.08) and the multiple (AOR: 3.20; 95% CI: 1.34-7.52) logistic regression models as their likelihood of late ANC initiation was a three times more compared to Dagombas when other independent variables (age, religion, marital status, educational level etc.) were adjusted for. The odds of women from the Southern ethnic group initiating ANC late was not significantly different compared to pregnant women form the Dagomba ethnic group in both the simple (UOR: 1.96; 95% CI: 0.65-5.89) and the multiple (AOR: 1.08; 95% CI: 0.20-5.81) binary logistic models after controlling for other independent variables.

Women who responded yes to delay of ANC by unsatisfactory service, was also shown to be a predictor of late initiation of ANC service in both crude and adjusted analysis. The odds of initiating ANC late among women who agreed that unsatisfactory ANC service could delay ANC initiation was higher (UOR: 3.29; 95% CI: 1.76-6.14) compared to those who said unsatisfactory ANC service could not delay ANC initiation in the simple logistic model. After adjusting for other independent variables, the odds among those who said unsatisfactory ANC services could delay ANC initiation reduced (A0R: 2.46; 95% CI: 1.21-5.01).

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Other variables such as religious affiliation, rating of ANC services, how nurses/midwives address pregnant women and perceived quality of ANC services which showed significance in the unadjusted model had no significance when they were adjusted for. This is presented in Table 4.4 and 4.5.

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Table 4.4: Factors Associated with the Timing of ANC Initiation

	SIMPLE LOGISTIC MODEL			MULTIPLE LOGISTIC MODEL		
Characteristics	**UOR**	**95% CI**	**P-value**	**AOR**	**95% CI**	**P-value**
Age categories						
17-24 years	ref			ref		
25-34 years	0.82	(0.44, 1.55)	0.542	1.38	(0.5, 3.82)	0.54
35-44 years	1.85	(0.56, 6.06)	0.311	1.71	(0.36, 8.22)	0.5
Religion						
Islam	ref			ref		
Christian	3.23	(1.47, 7.08)	0.003**	2.30	(0.65, 8.20)	0.199
Ethnicity						
Dagombas	ref			ref		
Gonja/other northern tribes	4.8	(2.28, 10.08)	0.001***	3.20	(1.34, 7.52)	0.008**
Southern tribes	1.96	(0.65, 5.89)	0.23	1.08	(0.20, 5.81)	0.932
Marital status						
Single	ref			ref		
Married	0.22	(0.05, 1)	0.05	0.38	(0.07, 2.16)	0.276
Cohabiting	0.44	(0.09, 2.08)	0.296	0.66	(0.11, 3.84)	0.640
Education Level						
No formal education	ref			ref		
Basic	0.63	(0.26, 1.53)	0.309	0.27	(0.07, 1.03)	0.056
Senior High School	0.81	(0.36, 1.83)	0.618	0.47	(0.15, 1.46)	0.19
Tertiary	1.14	(0.47, 2.73)	0.777	1.06	(0.24, 4.62)	0.939
Occupation						
Unemployed	ref			ref		
Employed Formal sector	1.75	(0.68, 4.5)	0.245	1.55	(0.33, 7.21)	0.577
Employed Informal sector	1.12	(0.58, 2.18)	0.736	1.1	(0.42, 2.83)	0.85
Parity						
No	ref			ref		
Yes	0.62	(0.33, 1.17)	0.137	0.52	(0.19, 1.42)	0.202
Gravidity						
Multigravida	ref					
Prim gravida	1.6	(0.84, 3.04)	0.151			
Culture support for ANC						
No	ref					
Yes	2.34	(0.14, 38.09)	0.549			

UOR: Unadjusted odds ratio. AOR: Adjusted odds ratio. CI: Confidence interval. Ref: Reference category. ANC: Antenatal care. *: p <0.05. **: p <0.01. ***: p <0.001

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Table 4.5: Other Factors Associated with the Timing of ANC Initiation

	SIMPLE LOGISTIC MODEL			MULTIPLE LOGISTIC MODEL		
Characteristics	**UOR**	**95% CI**	**P-value**	**AOR**	**95% CI**	**P-value**
Client satisfaction						
Satisfied	ref			ref		
Dissatisfied	2.45	(1.14, 4.45)	0.020*	1.43	(0.64, 3.19)	0.384
Delay of ANC by unsatisfactory ANC						
No	ref			ref		
Yes	3.29	(1.76, 6.14)	0.001***	2.46	(1.21, 5.01)	0.013*
Address by Nurses/Midwives						
By your name	ref			ref		
Other address	10.10	(1.45, 83.54)	0.020*	5.67	(0.62, 52.12)	0.126
Perceived quality of ANC						
Good	ref			ref		
Not good	2.5	(1.05, 6.05)	0.038*	0.78	(0.25, 2.49)	0.679
ANC within Locality						
No	ref			ref		
Yes	0.65	(0.35, 1.19)	1.63	0.83	(0.35, 1.93)	0.658
Transport to ANC in locality						
By foot	ref					
Personal transport	1.23	(.50, 3.04)	0.65			
Public transport	.83	(.31, 2.26)	0.72			
Transport to nearest ANC						
By foot	ref					
Personal transport	1.57	(.57, 4.36)	0.39			
Public transport	2.37	(.86, 6.50)	0.09			
Cost to nearest ANC facility						
Not costly	ref			ref		
Costly	1.71	(0.73, 4.04)	0.22	1.21	(0.43, 3.38)	0.722

UOR: Unadjusted odds ratio. AOR: Adjusted odds ratio. CI: Confidence interval. Ref: Reference category. ANC: Antenatal care. *: p <0.05. **: p <0.01. ***: p <0.001

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CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

The study sought to identify the proportion of pregnant women who initiates ANC late (at or after thirteen weeks gestation), the mean age of pregnancy at antenatal care (ANC) service initiation and the factors influencing the initiation of ANC services late at the Tamale Teaching Hospital and Tamale Reproductive and Child Health clinic. Overall, about 7 in 10 (69.9%) pregnant women initiated ANC late, comprising 42.7% of the women initiating ANC in their second trimester and 27.2% in the third trimester of pregnancy.

5.2 Prevalence of Late Initiation ANC

Recommendation from the World Health Organization (WHO), states that pregnant women need to commence antenatal care services very early in pregnancy (WHO, 2016). However, this is not the case as majority of women who are pregnant from Sub-Saharan African countries do not comply with this prescribed recommendation (WHO, 2016). This study revealed that majority (69.9%) of the participants initiate ANC late (at thirteen weeks of gestation or after) while a three in ten (30.1%) women initiated at or before twelve weeks gestation. This finding is comparable to other studies, such as Ifenne & Utoo (2012); Jeremiah et al., (2014); Tayie & Lartey, (2008) which reports a majority (70%) of late ANC initiation among pregnant women. However, this varies from another study conducted in Ghana by Doku, Neupane, & Doku, (2012), which found majority (57.3%) of women to have initiated antenatal care services early. The difference in findings from the two studies could be due to the fact that, this study was

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conducted in only two health facilities in the Tamale Metropolis whilst the other study had a broader scope of coverage using a secondary data from GDHS, 2008. The study further indicates that four in every ten (42.7%) pregnant women initiate antenatal care services in the second trimester similar to the findings by Maano & Tuwilika. N., (2017). Additionally, the mean gestation (19 ± 8.2) in this study can be compared to studies such as Ifenne & Utoo, (2012), which reported a mean gestation of 19.1 ± 7.8 at antenatal care initiation among pregnant women in North Central Nigeria. The effect of this finding is that pregnant women would have started folic acid supplementation after the first trimester due to late initiation of ANC services which could result in neural tube defects (Furness, Dekker, & Roberts, 2011).

The finding from this study further meant that for every ten pregnant women, seven of them initiate antenatal care services after the first trimester. This results in missed opportunities for most of the health interventions (screening for diseases and treatment, anemia prophylaxis and health education) associated with early initiation of ANC as reported by several studies (Kisuule et al., 2013; Abou-Zahr et al., 2003; Hawkes et al., 2013). Evidence exist to show that majority of women experience nausea and vomiting during the first trimester. This can results in malnutrition and the craving for non-nutritive substances and consumption of un-prescribed drugs. The effect of this may be the development of birth defects among unborn babies unless proper counselling is provided in early pregnancy (Furness et al., 2011).

5.3 Factors Influencing the Timing of ANC Initiation

5.3.1 Socio-Demographic Factors

The ages of pregnant women used in the study ranged from 17-44 years with a Median age of 26 years and Inter Quartile Range of 27 years. Majority (51%) of the women were within the ages

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of 25-34 years, age category 17-24 years constituted 38.4% and 10.7% of the women also constituted ages between 35-44 years. This finding aligns with that of 2010 population and housing census which found majority of the inhabitants of Tamale to be youthful (GSS, 2014). Age was found in the study not to be statistically significant in influencing the timing of antenatal care initiation. However, studies by Gudayu, Woldeyohannes & Abdo (2014), found maternal age to be associated with the early initiation of antenatal care services.

Regarding ethnicity of the participants (Table 4.1), Dagombas were the majority (51.9%), followed by Gonjas (7.8%). Mamprusi, Akan, Frafra and Others also constitute 5.3%, 8.7% and 26.2% respectively. The composition of Dagombas as majority in the Metropolis reflects the Ghana Statistical service report for the Metropolis in 2010 (GSS, 2014) which reports a similar finding. Ethnicity was found in our study to be associated with the timing of ANC (Table 4.4). Pregnant women who belonged to the ethnic group Gonja/other Northern tribes had a greater chance of initiating antenatal care services late. This means that about 4 in 10 (39.2%, total proportion of Gonja, Mamprusi, Frafra/other Northern tribes) women were likely to initiated ANC late missing the opportunity of timely detection and treatment of maternal syphilis resulting in neonatal morbidity and mortality (Hawkes et al., 2013). Several other studies found ethnicity to be associated with late initiation of ANC (Gross et al., 2012, Aseweh Abor et al., 2011). This therefore pre-supposes that there are certain practices and beliefs among women in the Tamale metropolis that serves a barrier to early utilization of maternal health care services. This therefore calls for cultural and ethnic reorientation towards antenatal service utilization.

The religious composition of the women revealed that the majority (70.9%) were Muslims, 28.6% were Christians whiles 0.5% were Traditionalist. This is similar to the 2010 Population

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and Housing Census Report for the Tamale Metropolis which reports Muslims as the majority followed by Christians and Traditionalist.

Additionally, more than half (52.4%) of the study participants were married, 39.3% were cohabiting whiles 8.3% were single. The 2010 population and housing census report from the metropolis indicates that 49% of the women were married while those who had never married constituted 44%. The widowed population was 4% (GSS, 2012). This means 5 in 10 women enjoyed spousal support in the Metropolis. This can lead to improved maternal and fetal outcomes since their husbands will have been of immerse benefits to them in terms of material and financial support (Adamu & Salihu, 2002).

Majority (69.4%) of the pregnant women from the study were employed whiles 30.6% did not have any employment. This means many of the women would have earned income from their jobs and increases their financial ability to pay for direct and indirect cost of health care services leading to improved well-being (Petrou, Kupek, Vause, & Maresh, 2001).

It is known from a study in Kenya that maternal higher education is accompanied with better understanding of health issue and results in uptake of health services with its resultant positive health outcomes (Perumal et al., 2013). This study has 55.8% of the participants attaining senior high and tertiary level education whiles those who had no education together with those who attained basic education also constituted 42.3% (Table 4.1). This finding indicates a good health seeking behavior among women in the Tamale Metropolis since majority (55.8%) of them will be able to appreciate the consequence of their health actions as reported by Perumal et al., (2013).

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5.3.2 Health-Service Related Factors

Another significant finding from the study is the delay of ANC by unsatisfactory services. From the study, women who were unsatisfied by ANC services were more likely to delay ANC initiation. It is worthy of noting that delayed initiation of antenatal care services has serious repercussions for maternal and fetal health as well as increasing their morbidity and mortality (Muhwava et al., 2016; Kisuule et al., 2013). This finding agrees with similar findings from Tanzania and Kenya which reports a lack of ANC quality resulting in dissatisfied ANC service with an association of late initiation of ANC (Gross et al., 2012, van Eijk et al., 2006, Audo et al., 2005). Similarly, Audo et al., (2005) reports from a Kenyan study that fifty percent of pregnant women will bypass the nearest ANC clinic or hospital to access care because of unsatisfactory service. The finding from this study results from the fact that once women sought ANC services and the service do not meet their expectation, their motivation to utilize those services again when the same opportunity avails itself, would have been lost no matter how much value they place on that service. This is a begging need for health care facilities to render satisfying services to their clients.

5.3.3 Environmental Factors

Factors within the women environment such as cultural acceptability of ANC, availability of ANC services within the locality, means of transport to ANC, means of transport to the nearest ANC clinic and cost of transportation to ANC clinic were shown in this study not to be associated with late initiation of antenatal care.

On cultural acceptability of ANC services, the finding from this study is so because almost all participants (99%) of them said their culture supported attending ANC during pregnancy and so

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could not serve as barrier to ANC initiation. This contradict the findings of Simkhada et al., (2008) in a systemic review which found culture to be associated with the timing of ANC service initiation.

Availability of ANC clinic in locality, means of transport to ANC as well as cost of transportation to ANC clinic showed no significance because Tamale has a fairly good road network (GSS, 2014) and a good number of health facilities (Northern Regional Annual Report, 2016). Also, because of the availability of ANC clinics in Tamale coupled with low transport cost and good road network, pregnant women will experience little challenges with transport as well as spend little time in reaching the nearest ANC clinic accounting for the finding in this study which is similar to the finding of Kyei, Campbell, & Gabrysch, (2012) which also found no effect of distance and timing of ANC. Unlike this study, Kisuule et al., (2013) found cost of transport to be associated with late initiation of ANC in Nigeria. Another systemic review by Simkhada et al., (2008) in four countries, Ghana, Kenya, Uganda and Tanzania also had a different finding from this study. In their review, they found availability of ANC services and cost to be associated with late uptake of ANC services.

5.6 Study Limitations

The major limitation of this study was the use of LMP in the estimation of gestation since most of the respondents had not done scan to determine the age of gestation. Therefore employing LMP as means of estimating gestation could resulted in wrong estimation of gestation. Additionally, bias could also result from our inability to independently verify some of the responses. Some responses might be given just because respondents wanted their responses to

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conform to attitudes that are socially desirable. Nonetheless, this may not affect the results of this study.

Also, time and limited resources did not allow for the inclusion of all ANC delivery health facilities within the Tamale metropolis. The limitation of the study to two health facilities therefore makes it difficult to generalize the findings of the study to other health facilities in the Metropolis.

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CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study sought to identify the factors associated with the timing of antenatal care service initiation among pregnant women in the Tamale Metropolis. Based on the findings from the study, the following conclusions were arrived at:

1. Pregnant women initiate antenatal care services late, that is, after the first trimester.
2. The gestational age at antenatal care service initiation among pregnant women was 19.0 ± 8.2 weeks.
3. Ethnicity and unsatisfactory antenatal care services predicts late initiation of antenatal care services in the metropolis.

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6.2 Recommendations

Based on the findings from this study, the following are recommended to achieve an early initiation of antenatal care services for better pregnant outcomes among women in the Tamale Metropolis:

1. Community-based educational campaigns by nurses, midwives and community health nurses on the importance of early initiation of antenatal care services through television shows, radio presentations and outreach programs. This will equip women with the necessary information about the significance of early antenatal against the dangers of late initiation of antenatal care.
2. Religious leaders such as Imams and Pastors could be used as medium to encourage their congregations during sermons and marriage ceremonies on the need for early initiation of antenatal care services.
3. The Ministry of Health/Ghana Health service should institute house to house/mobile antenatal care services in communities similar to the postnatal mobile clinics. This will afford health care personnel the opportunity to identify women who are pregnant and encourage them to initiate ANC early.
4. Health care facilities should render services that are satisfying to women and the general public.
5. Further research on ethnicity and the timing of ANC initiation is needed to better appreciate the association between ethnicity and late initiation of ANC services.

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APPENDICES

APPENDIX I: PARTICIPANT INFORMATION SHEET

FORM NUMBER [ ]

TITLE:

FACTORS ASSOCIATED WITH THE TIMING OF ANTENATAL CARE SERVICE INITIATION IN THE TAMALE TEACHING HOSPITAL AND THE TAMALE REPRODUCTIVE AND CHILD HEALTH CLINIC OF THE TAMALE METROPOLIS

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Introduction

I am a student from the School of Public Health, University of Ghana, Legon, conducting a research on the **'Factors Associated with the Timing of Antenatal Care Services Initiation among Pregnant Women'**. Please kindly find some few minutes of your precious time to fill this questionnaire. All information collected will be treated confidentially and no one will be able to trace any information back to you.

Procedure

The study subjects were pregnant women who initiated antenatal care services at the time of my data collection. After satisfying the criteria for inclusion, each participant was invited to an office where she was provided with a comfortable seat. Thereafter, the research assistant introduced herself and informed her that the research was to find out the factors associated with the timing of ANC and the results obtained would help address the identified challenges. The findings can also guide policy formulation and implementation.

The research assistant assured participants that information obtained through the interview would be treated confidentially. The interview lasted between ten to fifteen minutes. Participants felt free to ask questions during the interviewing or after the interview. They were made aware of their freedom to withdraw from participation at any point of the interview and this could not affect the service they sought.

The questionnaire they answered covered their biodata, economic, social, cultural and religious information. Their present and past pregnancy history, experiences at the health facility as well as how they got to the facility were enquired into.

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They signed consent forms to indicate their willingness to participate. Upon completion of the interview, the research assistant thanked the participant for spending time to take part in the research and reassured them that the information provided would be kept secured without disclosing it to anyone who was not part of the study and that nobody will trace any response back to them.

Risk and benefits

Some of the questions may be discomforting, however, they are helpful for the purpose of the research and may help identify factors associated with the timing of antenatal care services initiation which may in turn lead to policy formulation or change.

Right to refuse

Your consent to participate in the study is voluntary, you are not under any obligation to participate, and you are at liberty to withdraw from the study at any point in time. However, I will appreciate if you can complete the questionnaire for me.

Anonymity and confidentiality

Be rest assured that any information given will be used purely for the purpose of the research. All information given will be treated with utmost confidentiality. Your name will not be used in any report.

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Your right as a participant

This research has been reviewed and approved by the Ethical Review Committee of the Ghana Health Service. If you have any question about your right as a research participant you can contact the Ethical Review Administrator Ms. Hannah Frimpong on:

Office: +233 302 681109 Mobile: **233 (0) 243235225or 0507041223**

Email: Hannah.Frimpong@ghsmail.org

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APPENDIX II: CONSENT FORM

I have been invited to participate in a research interview on „Factors Associated with the Timing of Antenatal Care Service Initiation at the Tamale Teaching Hospital or the Tamale Reproductive and Child Health Clinic in the Tamale Metropolis". I have read the foregoing information or the foregoing information has been translated to me in a language I best understand and it"s content have been well understood. I have also been briefed thoroughly on the methods and importance of this study, the purpose of which I"m told could inform policy makers on how to address challenges relative to initiation of Antenatal Care Service in the Tamale Metropolis. I have been offered the opportunity to ask questions about the study and my questions have been answered to my satisfaction. I consent voluntarily to be a participant in the study.

…… ……. ……

Signature/Thumb print of Participant **Date**

…… ……. ……

Signature of Research Assistant **Date**

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APPENDIX III: INTERVIEWER'S STATEMENT

I the undersigned have read and explained to the subject in the language she understood best and the subject has agreed to take part in the study.

…… ……. ……

Signature of Research Assistant **Date**

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APPENDIX IV: QUESTIONNAIRE

QUESTIONNAIRE ON FACTORS ASSOCIATED WITH THE TIMING OF ANTENATAL CARE SERVICES INITIATION AT THE TAMALE TEACHING HOSPITAL AND THE TAMALE REPRODUCTIVE AND CHILD HEALTH CLINIC IN THE TAMALE METROPOLIS.

Instructions

You have been selected to participate in a research study. Please note that by completing this questionnaire you are voluntarily agreeing to participate in this research. You will remain anonymous and your data will be treated confidentially at all times. You may withdraw from this study at any time during the completion of the questionnaire. This questionnaire consist of four (4) sections. Section A – Socio-demographic characteristics. Section B- Environmental factors. Section C- Factors within the facility. Section D- Access factors

Please complete the questionnaire in full. Please tick (√) the appropriate answers in the boxes or fill in the blank spaces as required.

Name of facility Tamale Teaching Hospital [1] Reproductive and Child Health Clinic [2]

SECTION A. SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Age (at last birthday) ……years
2. What is your religious affiliation? [1] Muslim [2] Christian. [3] Traditionalist. [4] No religion [5] Others specify …….
3. Ethnicity ……..
4. Marital status: [1] Single [2] Married [3] Cohabiting. [4] Divorced. [5] Widowed
5. Educational level. None [0] [1] Basic [2] Senior High School [3] Tertiary
6. Occupation. [1] Unemployed [2] Employed Formal sector

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[3] Employed Informal sector

7. How many children have you given births to (parity)? …….
8. How many of your children are alive? ……...
9. How many of your children have passed away? ……..

SECTION B. ENVIRONMENTAL FACTORS

10. Is this your first pregnancy (gravidity)? No [0] Yes [1]
11. Did you attend ANC during your previous pregnancy? No [0] Yes [1]
12. How was your experience at ANC?

    [1] Dissatisfied [2] Satisfied [3] Neutral
13. Why do you attend antenatal clinic? *Tick as many as possible*

		No	Yes
a.	To monitor the progress of my pregnancy	0	1
b.	Because of ill-health in pregnancy	0	1
c.	Because other pregnant women are visiting	0	1
d.	For immunization during pregnancy	0	1
e.	To receive education on health during pregnancy	0	1
f.	Others (specify) ……	0	1

14. Where were these services rendered? [1] Private place [2] Open place
15. How will you rate the service in relation to the reason(s) for attendance?

    [1] Dissatisfied. [2] Satisfied. [3] Neutral
16. Does your culture support antennal care service? No [0] Yes [1]
17. Does unsatisfactory ANC services delay your initiation of ANC service?

    No [0] Yes [1]
18. Will you seek ANC services in subsequent pregnancies? No [0] Yes [1]

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SECTION C. FACILITY RELATED FACTORS

19. Date of first attendance at ANC in current pregnancy ……

20. Gestational age on first ANC attendance in weeks by

a.	Scan	
b.	Last menstrual period	

21. How were you addressed by the nurses/midwives on your visit?

[1] By your name. [2] By your dress. [3] By your color

[4] Others (specify) ……

22. What is your perception about the quality of ANC services?

[1] Bad. [2] Good. [3] Neutral.

SECTION D. ACCESS FACTORS

23. Do you have antenatal care clinic(s) within your locality? No [0] Yes [1]

24. If yes, how do you get to the ANC clinic?

[1] By foot. [2] By personal transport. [3] By public transport

25. What is the cost of transport if you are not footing to ANC? ……..

26. By what means do you access the nearest ANC clinic?

[1] By foot. [2] By personal transport. [3] By public transport

27. How much will it cost you to attend the nearest ANC? ……

28. Do you perceive ANC service to be free? No [0] Yes [1]

29. Will the perceived cost of ANC service delay your initiation of ANC services in subsequent pregnancies? No [0] Yes [1]

30. Do you perceive ANC services to be accessible? No [0] Yes [1]

31. Which services do you perceive to be accessible? *(Tick all that apply)*

		No	Yes
a.	Physical examination	0	1
b.	Immunization	0	1
c.	Health education	0	1
d.	Pharmacy services	0	1
e.	Investigations	0	1

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32. Which of these factors will delay your initiation of ANC services in subsequent pregnancies?

		No	Yes
a.	Absence of physical examination	0	1
b.	Absence of immunization	0	1
c.	Absence of health education	0	1
d.	Absence of pharmacy services	0	1
e.	Absence of investigations	0	1

33. When do you think is the right time for a pregnant woman to start ANC?

[1] Immediately you noticed you are pregnant

[2] When other people noticed you are pregnant

[3] When your husband ask you to attend ANC

[4] When you think is time to deliver

34. Why are you initiating ANC service now? *Tick all that apply*

		No	Yes
a.	I didn‟t know I was pregnant	0	1
b.	I didn‟t want people know	0	1
c.	I didn‟t have my partner‟s permission	0	1
d.	I didn‟t have money	0	1
e.	Because the ANC clinic is far	0	1

THANK YOU FOR YOUR PARTICIPATION