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SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

IMPACT EVALUATION OF THE QUALITY OF ANTENATAL CARE (ANC) OFFERED BY HEALTH CARE PROVIDERS AT KINTAMPO NORTH MUNICIPALITY.

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER DEGREE OF SCIENCE PUBLIC HEALTH, MONITORING AND EVALUATION

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DECLARATION

I, Adolphine Adofowa Kwarteng declare that this work is the result of my own investigation under the supervision of Dr. Justice Moses K. Aheto. Literatures from studies by other people have been duly recognized. For another degree, the whole or part of this work has not been presented to any other institution.

…….. ……

Adolphine Adofowa Kwarteng **Dr. Justice Moses K. Aheto**
(Student) **(Supervisor)**

Date 17th October, 2022…….. **Date** 15th September 2023……

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DEDICATION

This piece is dedicated to the memory of my father, Dr. Kwaku Poku Asante

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ACKNOWLEDGEMENT

I am grateful to the almighty God for the knowledge and strength through this work. I am also thankful to my supervisor and my family for supporting me with their prayers.

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ABSTRACT

Background

Antenatal Care (ANC) is an essential component of safe motherhood programme, involving systematic medical supervision of the pregnant woman until labour or until delivery through elective caesarean section. Adhering to the ANC guidelines, it was expected that maternal mortality issues become solved. However, issues of maternal mortality persist.

Objective

The study was to assess an impact evaluation of quality ANC offered by ANC nurses in Kintampo North Municipality.

Method

A cross sectional descriptive study was employed in a quantitative approach. Convenient sampling method was used in selecting 79 nurses and midwives who work in ANC at selected health facilities within the Kintampo North Municipality.

Conclusion

The data revealed that 87.3% of the total participants' responses depicted high knowledge on ANC guidelines, 97.3% showed high knowledge on danger signs associated with pregnancy and 96.3% demonstrated quality ANC practices. The study found that nurses and midwives who work at the ANC in the Kintampo North Municipality have high knowledge level on ANC guidelines and danger signs associated with pregnancy. It was found that nurses and midwives who work at the ANC in the Kintampo North Municipality adhere to quality ANC practices.

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CHAPTER ONE

INTRODUCTION

1.1 Background

An integral part of a safe motherhood program is antenatal care (ANC), which is the systematic medical observation of the expectant mother up until labor or until delivery via elective caesarean section (Cunningham, Leveno, Bloom, Spong, Dashe, Hoffman & Casey, 2014). It aims to guarantee that every desired pregnancy leads to a healthy baby being delivered safely as well as a positive outcome for the mother. According to Tunçalp, Pena-Rosas, Lawrie, et al. (2017), ANC is still a useful strategy for lowering the risk of pregnancy-related problems.

Focused Antenatal Care (FANC), a replacement for the previous approach that required numerous visits and was not evidence-based, was adopted by the WHO in 2002. Pregnant women who qualify for FANC attend four prenatal sessions at particular gestational ages with tailored interventions that are sufficient to address their antenatal needs. These women must not have any medical conditions, other severe health risks, or pregnancy-related problems (WHO, 2002). In 2002, Ghana accepted FANC. Before 16 weeks, there should be the first visit. Between 20 to 24 weeks pass before the second visit. The third appointment is between 28 and 32 weeks, and 36 to 2 40 weeks is the fourth visit (Nyarko, Birungi, Armar-klemesu, et al., 2006). In Ghana, a sufficient number of prenatal visits is therefore deemed to be at least four. The percentage of pregnant women in Ghana who had at least four antenatal visits rose from roughly four in five in 2008 to about nine in ten in 2014, according to (Ghana Statistical Service [GSS], 2009). (GSS, 2015). However, it is unknown how many of these women followed the suggested timetable for all four visits and the causes of this adherence.

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The initial ANC visit is distinct from the others in that it has a different purpose. A chance for a pregnant woman to connect with official health services is given by a prompt first ANC visit, and it also enhances the likelihood that early screening of pregnant women can identify those who will need specialist care (Gebreyohannes, Ararso, Mengistu, Abay & Hadis, 2017). Additionally, the initial examination enables the medical professional to recognize pregnant women who are very prone to have serious obstetrical consequences like antepartum hemorrhage (Adriano, Ingeborg, Mercedes, et al., 2015). Preventive measures should be implemented during the initial visit, such as giving iron supplements and explaining why they are necessary, as well as offering to counsel if there are any warning signals (WHO, 2013).

Generally speaking, ANC aids in the identification of diseases linked to poor maternal and perinatal outcomes, assisting in the provision of preventive and therapeutic health care for the expectant mother and the fetus (Lawrence Mbuagbaw, Nancy Medley, Andrea, et al., 2015). Delivering the proper medical care to the patient's risk level requires antenatal care. ANC also offers physical and psychological support to expectant moms while educating them on diet, personal cleanliness, and birth preparation. All of these advantages work together to give expectant mothers the chance to avoid or minimize difficulties during pregnancy, birth, and the 3 puerperium and to better equip them to care for their children on a physical, psychological, and social level (Ekabua, Ekabua & Njoku, 2011).

1.2 Statement of the Problem

Maternal mortality is one of the major public health challenges in developing countries, which is evidenced by approximately 94% of global maternal deaths occurring in developing countries whiles two-thirds of deaths occur in Sub Sahara Africa (World Health Organization [WHO], 2019). These deaths mostly occur because of complications during the gestational period and

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delivery. According to the WHO, these complications develop during pregnancy and the majority of these complications are inevitable. Most of these complications can be detected, managed, and prevented when pregnant women get access to quality ANC services.

The ANC coverage has been on the ascendancy over the past years in Ghana including Kintampo North municipality. In Ghana, available statistics indicate an increase in ANC coverage from 28% in 2008 to 60% in 2016. Data from the Ghana Health Service (GHS), specifically, the District Health Information Management System (DHIMS2) indicates that ANC coverage in the Kintampo North municipality increased from 45% in 2018 to 70% in 2020 (GHS DHIMS2, 2020). However, regardless of the increase in Ghana, maternal mortality has still not seen any significant reduction; affirmed by the evidence of Ghana's failure in Millennium Development Goal 5 (MDG), which aimed at reducing the maternal mortality ratio by three-quarters (75%) between the year 2015. From the records of WHO (2019), Ghana's maternal mortality ratio was approximately 308 maternal deaths per 100,000 live births in 2017. The institutional maternal mortality ratio in Kintampo north municipality increased from 49.7 in 2019 to 70.7 in 2020 (GHS DHIMS2, 2020).

The above statistics reveal how critical the maternal mortality issue has become in Kintampo, despite the increase in ANC coverage. According to Amoakoh-Coleman, Klipstein-Grobusch, Agyepong, Kayode, Grobbee et al. (2016), the reason could be attributed to low knowledge of nurses on the use of the ANC guidelines; a findings from their study based on which they recommended programs that promote complete adherence to guidelines as a way to improve the pregnancy outcomes within the Greater Accra Region. Though no empirical data could be relied on for appreciating the phenomenon in Kintampo, the reason provived by Amoakoh-Coleman, et al. (2016) may not be exclusive to the Greater Accra Region and could also the same reason for

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the case in Kintampo. Thus, the reason for this increase in maternal mortality in Kintampo regardless of the increased coverage of ANC could be a gap in the knowledge of ANC nurses who work in healthcare facilities in Kintampo. However, to substantiate whether it is actually a deficit in nurses' knowledge of ANC guidelines responsible for the increasing rise in maternal mortality, despite the increase in ANC coverage, empirical evidence would need to be unveiled. Given that, this study was poised at determining an impact evaluation of quality ANC offered by ANC nurses in Kintampo North Municipality.

1.3 Conceptual Framework

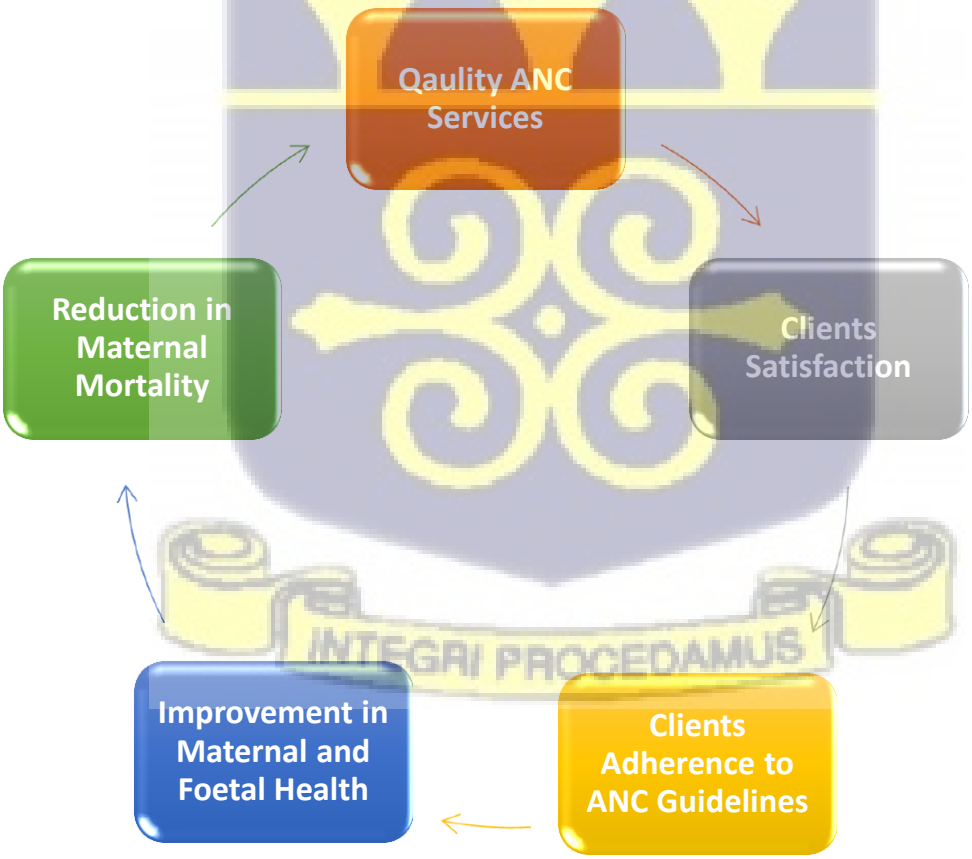

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Figure 1: Conceptual framework

Source: Quayson (2022)

Figure 1 depicts the conceptual framework for the study, and it communicates a cyclical operationalization of five major factors aimed at reducing maternal mortality, when quality ANC services are provided by nurses.

From figure 1, it could be identified that providing quality ANC services to clients will directly lead to satisfaction of clients (pregnant woman and her family). Once clients are satisfied with services provided by nurses in the ANC clinic, the clients are more likely to adhere to the ANC guidelines. Adhering to the ANC guidelines by clients means that they would religiously comply by the time schedule provided to them by nurses, depending on their classification, as well as the treatment, education, advice, and counselling offered by the nurse. This will in turn, result in improvement in the health of the pregnant woman and the foetus, leading to safe delivery. Hence, reducing maternal mortality. Once the mother is healthy, she would, again, promptly resort to ANC clinic for the quality services provide. This ensues in a cyclical operationalization of the factors, as depicted by figure 1.

1.4 Justification

The study was envisaged to bring to identify the gap in the knowledge of ANC nurses in Kintampo Hospital, to substantiate whether it was a deficit in ANC nurses' knowledge responsible for the increase in maternal mortality, despite the increase in ANC coverage. This would help healthcare professionals, authorities in charge of health (like the Ministry of Health and Ghana Health Service), and other stakeholders, to put up measures for implementation that would help bridge the gap in the knowledge of ANC nurses on ANC guidelines. Once ANC nurses' knowledge gap on ANC guidelines was bridged, they could be able to provide quality

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care to pregnant women attending ANC clinics. This would, in turn, help reduce the maternal mortality recorded in Kintampo, in response to the increased ANC coverage in the area. The study would also increase the body of knowledge by adding to studies conducted in Ghana concerning ANC.

1.5 Research Question

1. What is the knowledge level of ANC guidelines among nurses in Kintampo North Municipality?
2. What is the knowledge level of ANC nurses in Kintampo North Municipality on danger signs associated with pregnancy?
3. Do nurses in Kintampo North Municipality adhere to quality ANC practices during the client's first visit?

1.6 General Objective

To assess the impact evaluation of quality ANC offered by ANC nurses in Kintampo Hospital.

1.6.1 Specific Objectives

1. To assess the Knowledge of ANC guidelines among nurses in Kintampo North Municipality.
2. To evaluate the knowledge of ANC nurses in Kintampo North Municipality on danger signs associated with pregnancy
3. To determine the practice of quality ANC provided by ANC nurses during clients' first visit at the Kintampo North Municipality.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Pertinent literature related to adherence to antenatal care (ANC) guidelines was reviewed. Information from literature was gathered from online journals, both abstract and full articles; and documents from websites of authorities such as WHO, CDC, and Ghana Health Service (GHS). The reasons for conducting a literature review included the following: to provide a thorough understanding of the topic under study; to identify similar studies done within the area; to identify knowledge gaps that demand further investigations and to critique existing findings and suggest further studies. Relevant literature related to the objectives of this study that were reviewed were grouped under the following main headings:

- The World Health Organization's (WHO) Antenatal Care (ANC) guidelines
- Health workers' level of compliance with ANC guidelines

Keywords such as 'antenatal,' 'adherence,' 'guidelines,' 'care,' 'knowledge,' 'nurses,' and 'pregnant women' were typed into online databases, especially PubMed and Google scholar. Most of the articles were obtained from PubMed, Science direct, and BMC nursing. As much as possible, an effort was made to get access to full-text articles but where access to full articles is impossible, the abstracts were used. The literature review was conducted within five days. However, the literature was reviewed again during the discussion of the results of this study to include newly published and overlooked articles. Even though most of the studies reviewed were current studies, certain landmark studies that date more than 10 years were also reviewed.

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2.2 The World Health Organization's (WHO) Antenatal Care (ANC) Guidelines

Antenatal care (ANC) is provided to expectant mothers by qualified medical experts to ensure the best possible health for the mother and unborn child throughout pregnancy (Carroli, Rooney & Villar, 2001). ANC includes risk assessment, illness prevention and treatment, health promotion, and education related to diseases that are connected to or present during pregnancy. ANC reduces maternal and perinatal morbidity and mortality through the early diagnosis and treatment of pregnancy-related problems as well as the identification of women and girls who are more prone than others to encounter complications during labor and delivery. Both directly and indirectly, this is achieved (Carroli, Rooney & Villar, 2001).

Additionally, ANC provides a critical opportunity to prevent and manage concurrent diseases through integrated service delivery because HIV and malaria infections are indirect causes of maternal morbidity and mortality and account for 25% of maternal fatalities and near-fatalities (Souza, Gülmezoglu, Carroli, et al., 2013). (IMPAC], 2016).

Since the introduction of the WHO ANC model which is also known as focused ANC (FANC) or basic ANC, ANC utilization has increased in low- and middle-income countries. This is a goal-oriented method to delivering evidence-based interventions carried out at four crucial phases throughout pregnancy and was adopted in 2002 (Lincetto, Mothebesoane-Anoh, & Munjanja, 2016). Below is a list and description of the FANC's five main priorities.

- Nutritional interventions
- Maternal and fetal assessment
- Preventive measures
- Interventions for common physiological symptoms

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- Health systems interventions to improve the utilization and quality of ANC.

2.2.1 Nutritional interventions

Throughout pregnancy, a balanced diet must have an adequate number of calories, protein, vitamins, and minerals to suit the needs of both the mother and the fetus. Even in low- and middleincome countries (LMICs), when several dietary deficits are usually present concurrently, many pregnant women's diets fall short of fulfilling these requirements (Tang, Chung, Dong & Terrin, 2016). Many women gain too much weight during pregnancy for a variety of reasons, which are linked to obesity, overweight, and unfavorable pregnancy outcomes. Although obesity has traditionally been associated with wealth, certain studies suggest that the burden of being overweight and obesity is shifting from wealthy to impoverished people (Popkin & Slining, 2013).

Anemia is associated with iron, folate, and vitamin A deficiency. The Eastern Mediterranean Region has a medium prevalence rate (38.9%), the Western Pacific, the Americas, and Europe have the lowest prevalence rates (24.3%, 24.9%, and 25.8%, respectively), and South-East Asia and Africa have the greatest prevalence rates (48.7% and 46.3%, respectively) (WHO, 2015). Parasitic illnesses including malaria, hookworm, and schistosomiasis are major causes of anemia in regions where these infections are common (WHO, 2015). The prevalence of anemia is also influenced by chronic infections like HIV and TB as well as hemoglobinopathies like sickle cell disease.

According to estimates, 0.8 million pregnant women worldwide suffer severe anemia, which is indicated by blood hemoglobin levels below 70 g/L. (WHO, 2015). Severe anemia during pregnancy raises the risk of mother and fetal mortality (WHO, 2016). Iron supplementation is thought to be effective in treating roughly half of the anemia that occurs in pregnant women 10

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(WHO, 2015); however, this percentage might vary greatly and is probably much lower in places where malaria is prevalent. In addition to resulting in anemia, iron deficiency has negative effects on the body's ability to function and productivity at work, as well as on immunological function and infection-related morbidity. Anaemia and prenatal neural tube abnormalities are both associated with foliate (vitamin B9) deficiency (WHO, 2016). About 19 million pregnant women suffer from vitamin A insufficiency, primarily in Africa and South-East Asia, which results in night blindness.

According to the WHO (2013), pre-eclampsia risk is raised by calcium shortage, while zinc, vitamin E, vitamin C, and vitamin B6 deficiencies have all been linked to pre-eclampsia. Impaired immunity is linked to zinc deficiency (Roohani, Hurrell, Kelishadi & Schulin, 2013). Although zinc, iron, and other mineral supplements may compete with vitamin C for absorption, it is unclear if such combinations have any negative health effects. Vitamin C intake increases iron absorption from the gut (Roohani, Hurrell, Kelishadi & Schulin, 2013). For the interventions of the ANC guideline, counselling on healthy eating and physical activity were provided as follows.

- A varied diet that includes fruits, whole grains, meat, fish, green and orange vegetables, beans, and nuts is considered to be healthful. These foods deliver the recommended caloric, protein, vitamin, and mineral intake (WHO, 2015).
- Stakeholders may want to consider culturally appropriate healthy eating and activity programs to prevent excessive weight gain in pregnancy, especially for populations with a high prevalence of overweight and obesity, depending on resources and women's preferences. Interventions should be developed to ensure adequate weight gain, offered

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11 without judgment and centered on the lady's requirements (see further information in points below).

- Both strength conditioning and aerobic exercise are necessary to maintain a good level of fitness throughout pregnancy without trying to obtain peak fitness or get ready for athletic competitions. Women should choose activities with less risk of falling or harming an unborn child (Royal College of Obstetricians and Gynecologists [RCOG], 2006).
- The majority of the average gestational weight gain occurs after 20 weeks of pregnancy, and while regional differences may influence the concept of "normal," pre-pregnancy body mass index should be taken into consideration (BMI). Women who are underweight at the beginning of pregnancy (defined as having a BMI of 18.5 kg/m2) should aim to gain 12.5- 18 kg, women who are normal weight at the beginning of pregnancy (defined as having a BMI of 18.5-24.9 kg/m2) should aim to gain 11.5-16 kg, and overweight women (defined as having a BMI of 25-29.9 kg) should aim to gain 11.5-16 kg, according to the Institute of Medicine classification (Rasmussen & Yaktine, 2009).
- The majority of research on treatments for healthy eating and exercise comes from high-income countries (HICs), and the GDG noted that at least 40 studies in this field are currently being conducted in HICs. The GDG emphasized the need for additional research on the success, acceptability, and effects of healthy eating and activity initiatives in LMICs.
- Pregnancy may be an ideal time for behavior modification interventions in areas with a high prevalence of overweight and obesity, and it's critical to look into how these therapies affect women, children, and partners in the long run.

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- According to the GDG, practitioners need a thorough training program that offers consistent nutritional guidance. This counsel should be based on solid evidence, be 12 enduring, reproducible, approachable, and flexible enough to work in many cultural contexts.

2.2.2 Maternal and Foetal Assessment

2.2.2.1 Maternal Assessment

Anaemia: It is described as having a blood hemoglobin (Hb) level under 110 g/L. With a global incidence of anaemia among pregnant women at roughly 38%, anemia is one of the most important global public health issues and the second biggest cause of disability in the world (WHO, 2016). The clinical assessment method, which involves looking for pallor in the conjunctiva, is frequently used to identify anemia but has been proven to be quite unreliable. The standard ANC procedure in high-income countries (HICs) includes a whole blood count, which calculates the blood Hb level (Sobhy, Rogozinska & Khan, 2016). However, this test and others might be too pricey, complicated, or difficult to employ in rural or LMIC settings. It is therefore necessary to develop a low-cost and precise method of diagnosing anaemia for areas with no or restricted access to laboratory facilities. A drop of undiluted blood is placed on specialized chromatography paper and using the WHO-developed haemoglobin color scale, it is compared to a spectrum of colors representing various Hb concentrations in increments of 20 g/L. Undiluted blood is placed straight into a microcuvette during a haemoglobinometer test, which inserts the microcuvette into a haemoglobinometer (or photometer) to generate a reading (Sobhy, Rogozinska & Khan, 2005).

Asymptomatic bacteriuria (ASB): ASB, a common urinary tract condition, is associated with a higher risk of urinary tract infections (cystitis and pyelonephritis) in pregnant women.

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Escherichia coli is present in up to 80% of isolates, along with Klebsiella species, Proteus mirabilis, and group B streptococcus (GBS) (Smaill & Vazquez, 2015). The gold standard in ASB diagnosis—Gram stains, urine dipstick tests, and midstream urine cultures—are all accessible. A urine culture can 13 produce a result in up to seven days, and the diagnostic threshold is commonly defined as the presence of 105 colony-forming units (cfu)/mL of a single organism (Schmiemann, Kniehl, Gebhardt & Matejczyk, 2010). Using the color stains crystal violet and safranin O, the Gram stain test emphasizes and distinguishes between Gram-positive (purple) and Gram-negative (red) organisms on a prepared glass slide. Urine dipsticks test for nitrites, which are not present in normal urine, and leucocytes, which are identified by a reaction with leucocyte esterase, in order to assess the presence of pus and bacteria, respectively, in the urine. Once discovered, ASB is normally carefully managed with antibiotics because it raises the risk of premature birth.

Intimate partner violence (IPV): IPV is described as any activity in an intimate relationship that is harmful to the individuals in it physically, psychologically, or sexually. It is widely accepted as a global public health issue. Close to one-third of all women in relationships have experienced physical or sexual abuse at the hands of an intimate partner (WHO, 2013).

Emotional abuse, which includes being humiliated, ridiculed, terrified, and the target of controlling actions such as being prohibited from meeting friends or relatives, has a detrimental effect on people's health as well (WHO, 2013). IPV is associated with persistent problems in females, including poor reproductive health (including a history of STIs like HIV, unintended pregnancies, abortions, and/or miscarriages), depression, substance abuse, and other mental health problems (WHO, 2013). Theoretically avoidable risk factors for IPV include mother and fetal deaths among other poor pregnancy outcomes. Clinical IPV inquiry looks for women who

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have or are experiencing IPV in order to identify them and offer therapies that enhance results. Some governments and professional organizations advocate screening all women for IPV rather than only speaking with those who exhibit symptoms (WHO, 2013).

2.2.2.2 Fetal Assessment

Daily fetal movement counting: Maternal knowledge of decreased fetal movements is linked to poor perinatal outcomes, including fetal mortality (Pearson & Weaver, 1976). Daily fetal movement counting, also known as the Cardiff "count-to-ten" strategy employing kick charts, is a technique for screening for fetal well-being in which a woman counts daily fetal movements to assess the health of her unborn child. This is done to alert medical staff when the baby may be in danger in an effort to reduce perinatal mortality (Mangesi, Hofmeyr, Smith & Smyth, 2015). All pregnant women may undergo routine daily fetal movement counting, or only those who are deemed to be at a higher risk of having a baby with difficulties. Early fetal impairment identification may allow for rapid clinical actions to enhance perinatal outcomes, but it may also make mothers more anxious or need unnecessary clinical tests. Furthermore, it's possible that the window of opportunity between fetal movement decline and mortality is too small for effective intervention (Enkin, Keirse, Neilson, Crowther, et al., 2000).

Symphysis-fundal height (SFH) measurement: The SFH measurement is a commonly used method for assessing fetal growth. It involves measuring the SFH with a tape measure in order to detect intrauterine development restriction (IUGR). It can also be used to detect multiple pregnancies, macrosomia, polyhydramnios, and oligohydramnios. For fetuses growing properly beginning at 24 weeks, the SFH measurement in centimeters should equal the number of weeks of gestation with a 2-cm margin in each direction (Robert Peter, Ho, Valliapan & Sivasangari, 2015). Additional methods for evaluating fetal growth include abdominal examination of fundal

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height in relation to anatomical landmarks such as the umbilicus and xiphisternum, assessment of abdominal girth, and recurrent ultrasound measurements of the fetal parameters (Robert Peter, Ho, Valliapan & Sivasangari, 2015). Accurate low-cost approaches for detecting abnormal growth are 15 desired because ultrasound, the most accurate screening tool, is resource-intensive and not widely available in low- and middle-income countries (LMICs.).

Routine antenatal cardiotocography (CTG): The fetal heart rate and uterine contractions are continually recorded by CTG using an ultrasound transducer that is inserted into the mother's belly. CTG is often used in pregnancy as a way to assess fetal well-being, primarily in pregnancies with a higher risk of complications and during birth.

Fetal ultrasound examination: A diagnostic ultrasound examination is utilized throughout pregnancy in several unique circumstances, such as when there are concerns about fetal growth and after clinical issues. However, it has been thought that all pregnancies should have a prenatal ultrasound scan because adverse outcomes might occur in pregnancies without evident risk factors. This will enable earlier detection of problems like multiple pregnancies, IUGR, congenital abnormalities, malpresentation, and placenta previa that might not be visible. Additionally, it will make it possible to estimate gestational age accurately, allowing for prompt and efficient treatment.

Fetal Doppler ultrasound examination: In the third trimester of pregnancy, Doppler ultrasonography equipment analyzes the waveforms of the umbilical artery and other fetal arteries to determine the health of the fetus. To detect fetal compromise and hence lower perinatal mortality, it is frequently utilized in high-risk pregnancies (Maulik, Mundy, Heitmann & Maulik, 2010). It may therefore be helpful when carried out as a prenatal intervention to identify fetal compromise and foretell problems, including IUGR and pre-eclampsia, in

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otherwise healthy pregnancies. When determining if a fetus is fundamentally tiny (SGA) or growth-restricted (IUGR), doppler ultrasonography is helpful (Soothill, Ajayi, Campbell & Nicolaides, 1993). It may be carried out either independently or in conjunction with a fetal ultrasound examination. The test measures the umbilical artery's blood flow using either a resistive index or a pulsatility index 16 (Alfirevic, Stampalija & Medley, 2015). A higher risk of IUGR and pre-eclampsia is frequently indicated a high blood flow resistance, which highlights the need for additional research.

2.2.3 Preventive Measures

Asymptomatic bacteriuria (ASB): A diagnostic ultrasound examination is utilized throughout pregnancy in a number of unique circumstances, such as when there are concerns about fetal growth and after clinical issues. However, it has been thought that all pregnancies should have a prenatal ultrasound scan because adverse outcomes might occur in pregnancies without evident risk factors. This will enable earlier detection of problems like multiple pregnancies, IUGR, congenital abnormalities, malpresentation, and placenta previa that might not be visible. Additionally, it will make it possible to estimate gestational age accurately, allowing for prompt and efficient treatment. According to Rizvi, Khan, Shukla, Malik, and Shaheen (2011), up to 45% of pregnant women with ASB may experience this problem, which is linked to a higher risk of premature birth.

Recurrent urinary tract infections: After a prior urinary tract infection (UTI) has resolved, usually following treatment, a recurrent urinary tract infection (RUTI) is a symptomatic infection of the urinary tract (bladder and kidneys). Two UTIs during the past six months, or a history of one or more UTIs before or during pregnancy, are some examples of the several definitions of RUTI (Schneeberger, Geerlings, Middleton & Crowther, 2012). Pregnant women frequently

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experience RUTIs, which have been linked to negative pregnancy outcomes like preterm birth and small-for-gestational-age babies (Schneeberger, Geerlings, Middleton & Crowther, 2012). According to estimates, 2% of pregnancies result in pyelonephritis (kidney infection), with a recurrence rate of up to 23% during the same pregnancy or soon after giving birth (Schneeberger, 17 Geerlings, Middleton & Crowther, 2012). The most effective approach to avoid RUTI during pregnancy is little understood.

Rhesus D alloimmunization: If a mother is rhesus (Rh) negative and has a newborn who is Rh positive, she runs the risk of developing anti-Rh antibodies, which can result in HDN in subsequent pregnancies. RhD alloimmunization and HDN can be avoided by providing anti-D immunoglobulin to Rh-negative mothers within 72 hours of having a Rh-positive child (McBain RD, Crowther CA, Middleton, 2015). Postpartum anti-D will not, however, protect against Rhesus alloimmunization brought on by occult transplacental hemorrhages in the third trimester.

Soil-transmitted helminthiasis: In LMICs, anaemia affects more than 50% of expectant mothers, and helminthiasis is a major contributing factor in endemic areas (McBain RD, Crowther CA, Middleton, 2015). Roundworms (Ascaris lumbricoides), hookworms (Necator americanus and Ancylostoma duodenale), and whipworms are the principal parasites that transfer illnesses through soil (Trichuris trichiura). These worms, especially hookworms, feed on blood and release substances that induce bleeding to continue, leading to iron deficiency anemia (Salam, Haider, Humayun & Bhutta, 2015). Because they cause anorexia, vomiting, and diarrhea, they may also decrease the absorption of iron and other minerals (Blencowe, Lawn, Vandelaer, Roper & Cousens, 2013).

Neonatal tetanus: A tetanus exotoxin generated by Clostridium tetani causes this acute illness. Tetanus spores, which are invariably present in the soil, are the main source of neonatal

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infection, and in order for babies to be protected at birth, they must have received maternal antibodies via the placenta. Neonatal illness typically manifests within the first two weeks of life and causes global rigidity and excruciating muscle spasms; in the majority of cases, this condition is fatal without medical attention (Blencowe, Lawn, Vandelaer, Roper & Cousens, 2013). Neonatal 18 tetanus deaths have decreased globally and are still decreasing as a result of global immunization campaigns; estimations show a decrease from an estimated 146 000 deaths in 2000 to 58 000 (CI: 20 000-276 000) in 2010. (Blencowe, Lawn, Vandelaer, Roper & Cousens, 2013). High immunization rates are necessary even though eradication of tetanus is not physiologically possible due to the widespread nature of its spores in the environment (Maternal immunization against tetanus: integrated management of pregnancy and childbirth [IMPAC], 2006).

2.2.4 Interventions for common Physiological Symptoms

About 70% of pregnant women experience nausea and vomiting symptoms, which frequently start in the first trimester, according to Einarson, Piwko, and Koren (2013). After 20 weeks of pregnancy, 20% of women, however, may still suffer these symptoms (Matthews, Haas, O'Mathna, & Dowswell, 2015). Estimates indicate that 8% of pregnant women have severe impairments and that 50% of them experience low back and pelvic pain (Phupong & Hanprasertpong, 2015). Twothirds of pregnant women may experience worsening heartburn symptoms after eating and lying down (Phupong & Hanprasertpong, 2015). In addition to the vulva and the rectum, varicose veins can also affect the legs. They may result in discomfort, nighttime cramps, soreness, and weight gain, and extended standing may make them worse (Smyth, Aflaifel & Bamigboye, 2015). Hemorrhoids can exacerbate the discomfort of constipation, which can be very unpleasant (Rungsiprakarn, Laopaiboon, Sangkomkamhang,

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Lumbiganon & Pratt, 2015). Leg cramps are a common nighttime occurrence that can be highly unpleasant and interfere with daily activities (Zhou, West, Zhang, Xu & Li, 2015). There are many potential non-pharmacological and pharmaceutical remedies for common physiological problems. Non-pharmacological treatments include ginger, lemon oil, mint oil, chamomile, and vitamin B6.

2.2.5 Health Systems Interventions to improve the Utilization and Quality of ANC

Case notes kept by women: In many nations, pregnant women are given their own case notes (or home-based records) to keep with them. Women are expected to bring case notes with them to every medical appointment, whether they are kept in paper form (e.g., on a card, notebook, or handbook) or electronically (e.g., on a memory stick). The use of women-held case notes may increase the accessibility of women's medical records if women relocate to another facility or are referred there due to issues when instant access to medical information isn't always attainable (Brown, Smith, Mori & Noma, 2015). Women's case notes may also be a useful tool for enhancing client-provider and health awareness communications (Mori, Yonemoto, Noma & Ochirbat, 2015). Case notes may be less likely to disappear when retained individually since inadequate infrastructure and resources frequently hinder effective record-keeping. Additionally, due to the enhanced continuity of fetal development data, the approach may enable a more precise assessment of gestational age, which is essential to evidence-based decision-making. Models of midwife-led continuity of care (MLCC): In many ANC contexts, midwives are the main healthcare professionals (Mori, Yonemoto, Noma & Ochirbat, 2015). In MLCC models, a woman is supported throughout the antenatal, intrapartum, and postnatal periods by a dependable midwife (caseload midwifery) or small group of dependable midwives (team midwifery),

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promoting a safe pregnancy, childbirth, and good parenting habits (Mori, Yonemoto, Noma & Ochirbat, 2015).

The MLCC model includes: providing the woman with individualized education, counseling, and ANC; being present during labor, delivery, and the immediate postpartum period by a reputable midwife; continuing support during the postnatal period; minimizing unnecessary technological interventions, and identifying, referring, and coordinating care for women who require (Sandall, 2014). If a result, the MLCC model operates within a multidisciplinary network 20 where, as needed, consultation with and referral to other care providers take place. The MLCC model often focuses on offering care to healthy women having straightforward pregnancies. Group ANC: Traditionally, ANC entails a one-on-one conversation between a pregnant woman and her medical professional. To improve pregnant women's behavior, enhance pregnancy outcomes, and boost women's satisfaction, group ANC, however, combines the standard individual pregnancy health assessment with customized group educational activities and peer support (Sandall, 2014). Self-assessment exercises, such as taking one's blood pressure, group instruction with facilitated discussion, and socializing time are frequently included in interventions. A room big enough to hold a number of women and have a private location for tests is required for group ANC.

Community-based interventions to improve communication and support: During the scoping assessment for the ANC guideline, communication and support for women were recognized as crucial components of fulfilling pregnancies. "Communicating" is defined as giving timely and relevant information, education, and communication to women about physiological, biological, behavioral, and sociocultural challenges, while "supporting" is defined as offering social, cultural, emotional, and psychological assistance (Mori, Yonemoto, Noma &

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Ochirbat, 2015). Having access to sufficient communication and support is essential to a high-quality ANC program. A human rights-based perspective asserts that women have a right to participate in decisions that affect their sexual and reproductive health (Mori, Yonemoto, Noma & Ochirbat, 2015). Furthermore, expecting mothers have a right to receive high-quality medical treatment, and in low-resource settings, in particular, they might need to be provided with the resources to do so. Interventions that encourage discussion about women's rights, barriers and enablers to using ANC services, maintaining health throughout pregnancy and beyond (including conversation about 21 newborn care and postnatal family planning), and supporting women and their partners in resolving difficulties they may encounter may improve ANC uptake and care quality.

ANC contact schedules: In order to improve standards of care and increase access to the procedure, especially in LMICs, the WHO pushed for a focused or goal-oriented approach to ANC in 2002. (Mori, Yonemoto, Noma & Ochirbat, 2015). The focused ANC (FANC) model, also known as the fundamental ANC model, calls for four ANC visits to occur between 8 and 12 weeks of gestation, between 24 and 26 weeks, at 32 weeks, and between 36 and 38 weeks. Each visit includes the appropriate referral of high-risk pregnant women and pregnant women with difficulties, as well as specific evidence-based interventions for healthy pregnant women (referred to as "goal-oriented" guidance). This model necessitates a great deal fewer visits than the ANC models utilized in HICs.

2.3 Health Workers' Level of Compliance with ANC Guidelines

In a cohort study in Ghana that aimed to assess provider compliance with early prenatal care recommendations and the risk of pregnancy problems, According to Amoakoh-Coleman, Klipstein-Grobusch, Agyepong, Kayode, Grobbee, and Ansa (2016), 48.5% of the 926 midwives

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who were monitored for up to six weeks adhered strictly to the recommended standards of care. Accordingly, the frequencies of preterm births, low birth weight, stillbirths, and neonatal mortality were 5.3%, 6.1%, 0.4%, and 1.4% frequent. Complete adherence to the advice decreased the chance of any newborn problem by 0.01 and the risk of a delivery complication by 0.04, respectively. Amoakoh-Coleman et al. (2016) came to the conclusion that provider compliance with all antenatal care recommendations at the initial antenatal appointment affects birth and neonatal outcomes. Additionally, they claimed that while it is crucial to recognize and comprehend the mechanisms that underlie these observations, initiatives that promote rigorous adherence to advice 22 will improve the outcomes of pregnancies. There were 11 healthcare establishments in the Greater Accra Region took part in the study. The study's great generalizability can be ascribed to its huge sample size of 926 over 11 healthcare facilities, despite the fact that there are many healthcare institutions in the area. The researchers may have missed significant information by utilizing such a large sample size for cohort studies, which would have increased the percentage of midwives who carefully followed the ANC recommendations. Due to the large sample size, it is also likely that the researchers were unable to conduct any observations, which may have led to fewer midwives adhering to the ANC recommendations.

According to Asah-Opoku, Ameme, Yawson, Guure, Aduama, Mumuni, Samba, and Maya (2019), of the 446 midwives they studied, 26.7% followed the suggested ANC criteria. According to Asah-Opoku et al., about 25% of participants followed the suggested ANC parameters in their practice. Using a cross-sectional study design and face-to-face interviews as the primary datagathering tool, the study included 446 midwives. The quality of the information acquired by the interviewer could be compromised if an interview approach was employed for a

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study with a large sample size. Since the data may not accurately reflect the information or intentions of the interviewee or respondents, data entry may also be suspect. This could have had an impact on the study's findings, which would have revealed that only 26.7% of the 446 respondents followed the ANC criteria in their practices.

A qualitative study found that the policy, infrastructure, standard operating procedures, and team coordination were the areas where health workers concentrated when providing ANC treatments at the study sites. The study also demonstrated that stronger leadership, more suitable policies, full 23 facilities and infrastructure, transparent operational standard procedures, and increased team coordination will all improve health workers' compliance with the ANC policy (Maryono, 2020). Additionally, Mchenga et al., 2019 showed in their study that focus ANC generally increased individual ANC content compliance. In the post-focused ANC era, the percentage of women who said they received all eight components rose from 9 to 11%. Additionally, there has been a marked rise in the collection of blood samples, the sharing of information regarding problems, the distribution of iron tablets, and the distribution of malaria prophylaxis (Mchenga et al., 2019). Furthermore, a comparative study carried out in Tanzania found that health professionals were aware of the focused ANC model guideline and had a favorable opinion of it. The degree of conformity with the targeted ANC model criteria varies, nevertheless. In order to make sure that the guidelines are followed, it is vital to increase the oversight of ANC services (Kalomboji, 2017). In addition, Mahmoud et al. (2020) found that only 3% of nurses in ANC clinics had good compliance, compared to 27% who had poor compliance and 70% who were fairly compliant with the initial antenatal visit.

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2.4 Monitoring and Evaluation Issues

2.4.1 Description of the Guidelines

Through timely and appropriate evidence-based treatments related to health promotion, disease prevention, screening, and treatment, antenatal care (ANC) is essential (WHO, 2021). ANC aims to integrate care delivery throughout pregnancy, decrease stillbirths and perinatal mortality, and reduce problems from pregnancy and childbirth.

The recommended number of visits for ANC is four. Specific interventions that are intended to achieve the aforementioned ANC goals must be given by the ANC nurse or midwife. The ANC 24 nurse or midwife is required to deliver particular interventions, such as history taking, inspecting the woman, screening and tests, treatments, preventative measures, and health education, advice, and counselling, in order to accomplish the defined goals of each visit. The recommendations are listed as follows.

The primary goal of the initial ANC visit is to determine the EDD and confirm pregnancy. Other goals include determining whether the client requires basic ANC (four visits) or more specialist care, treating the client, implementing preventative measures, creating a birth and emergency plan, and offering guidance and advice. The ANC nurse or midwife should do the following interventions at the first visit, which lasts between 8 and 12 weeks.

- On history taking, the ANC nurse or midwife assesses significant symptoms; takes psychosocial, medical, and obstetric history; confirms pregnancy and calculates expected date of delivery (EDD); classifies all women (after the test results) based on their condition.

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- On examination, the ANC nurse or midwife is expected to do a completely general and obstetric examination, as well as the vital signs of the client.
- With regards to screening and tests, the ANC nurse or midwife is supposed to request for tests like full blood count (FBC), urine routine examination (urine R/E), HIV, blood grouping, and bacteriuria.
- Concerning treatments, the ANC nurse or midwife is supposed to provide appropriate treatment for any abnormality identified during the screening and tests phase.
- On preventive measures, the ANC nurse or midwife should administer tetanus toxoid vaccine, iron, and folate 25
- On health education, advice, and counselling, the ANC nurse or midwife should provide clients information on self-care, alcohol and tobacco use, nutrition, safe sex, rest, sleeping under treated mosquito nets, and birth, and emergency plans.

The objective of the second ANC visit, which takes place between 24 and 26 weeks into the pregnancy, is to evaluate the health of the mother and the foetus, rule out anaemia and pregnancyinduced hypertension (PIH), provide preventive measures, review and modify the birth and emergency plans, and offer advice and counsel. The specific tasks carried out by the ANC nurse or midwife are listed below.

- On history taking, the ANC nurse or midwife assesses significant symptoms, checks, and records for previous complications and treatments during the first visit, and reclassifies the client if needed.
- On examination, the ANC nurse or midwife is expected to check for foetal growth, blood pressure (BP), anaemia, and foetal movement.

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- With regards to screening and tests, the ANC nurse or midwife is supposed to check for the presence of bacteriuria.
- Concerning treatments, the ANC nurse or midwife is supposed to serve anthelminthic, and antiretroviral (ARV) if eligible, and treat bacteriuria if indicated.
- On preventive measures, the ANC nurse or midwife should administer tetanus toxoid (TT), iron and folate, intermittent preventive treatment for malaria during pregnancy (IPTp), and ARV.
- On health education, advice, and counselling, the ANC nurse or midwife should provide the client's information on birth and emergency plan, reinforcing previous advice.

The goal of the third ANC visit, which is at 32 weeks, is to assess maternal and foetal well-being, exclude PIH, anaemia, and multiple pregnancies, give preventive measures, review, and modify birth and emergency plan, advice, and counsel. The activities involved are as follows.

- On history taking, the ANC nurse or midwife assesses significant symptoms, checks, and records for previous complications and treatments during the first visit, and reclassifies the client if needed.
- On examination, the ANC nurse or midwife is expected to check for foetal growth, blood pressure (BP), anaemia, and multiple pregnancies.
- With regards to screening and tests, the ANC nurse or midwife is supposed to check for the presence of bacteriuria.
- Concerning treatments, the ANC nurse or midwife is supposed to serve antiretroviral (ARV) if eligible and treat bacteriuria if indicated.
- On preventive measures, the ANC nurse or midwife should administer iron and folate, IPTp, and ARV.

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- On health education, advice, and counselling, the ANC nurse or midwife should provide clients information on birth and emergency plan, infant feeding, and postpartum or postnatal care, and reinforces previous advice.

The goal of the fourth ANC visit, which is from the period of 36 weeks to 38 weeks, is to assess maternal and foetal well-being, exclude PIH, anaemia, multiple pregnancies, mal-presentation, give preventive measures, review and modify birth and emergency plan, advice and counsel. The activities involved are as follows.

- On history taking, the ANC nurse or midwife assesses significant symptoms, checks, and records for previous complications and treatments during the first visit, and reclassifies the client if needed.
- On examination, the ANC nurse or midwife is expected to check for foetal growth and movement, blood pressure (BP), anaemia, mal-presentation, and multiple pregnancies.
- With regards to screening and tests, the ANC nurse or midwife is supposed to check for the presence of bacteriuria.
- Concerning treatments, the ANC nurse or midwife is supposed to serve antiretroviral (ARV) if eligible and treat bacteriuria if indicated.
- On preventive measures, the ANC nurse or midwife should administer iron and folate, and ARV.
- On health education, advice, and counselling, the ANC nurse or midwife should provide clients information on birth and emergency plan, infant feeding, postpartum or postnatal care, and pregnancy spacing, and reinforces previous advice.

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2.4.2 Types of Evaluation

Outcome evaluation will be used in this study. This is because the study seeks to evaluate the impact of quality antenatal care (ANC) as offered by nurses at the Kintampo Hospital. In that regard, the researcher would want to determine the knowledge on ANC guidelines, knowledge on danger signs associated with pregnancy, and practice of quality ANC provided by nurses during clients' first visit at the Kintampo Hospital. With this, the researcher would be able to evaluate whether the ANC services provided by nurses in Kintampo Hospital are in accordance with the best practices as outlined in the ANC guidelines by the World Health Organization. Thus, operationalizing the outcome evaluation.

CHAPTER THREE

METHODS

3.1 Study design

A descriptive cross-sectional survey with a quantitative data collection method was used for the investigation. With no manipulation of variables, a cross sectional design enables the collecting

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of data at a precise point in time. An extensive and well-researched questionnaire was employed in this instance to evaluate the employees' knowledge. In order to give the researcher a realistic image of the data set under examination, the descriptive research approach was used to collect precise, factual, and systematic data.

3.2 Study Area

Within the Bono East Region of Ghana, healthcare facilities located in the Kintamp North Municipality were used for the study. These healthcare facilities were Kintampo Municipal Hospital, Yizura Hospital, Sunkwa Clinic, Glory Prince of Peace Maternity, Babatokuma CHPS, Atta Akura CHPS, Dawadawa CHPS, Asantekwaaa CHPS, New Longoro Health Center, and Busuama Health Center.

Kintampo Municipal Hospital is a public secondary healthcare facility located in Nwoase near the police station and it serves as the main referral center for other healthcare facilities in the Kintampo North Municipality. Yizura Hospital is an NHIS accredited privately owned healthcare facility that provided general health services and is located in Kintampo North Municipality off the Kintampo-Tamale highway. The remaining healthcare facilities are CHPS and health centers that are primary healthcare facilities.

The nursing and midwifery population in the Kintampo North Municipality comprised of different cadre including Enrolled Nurses, Staff Nurses or Staff Midwives, and Nursing Officers or Midwifery Officers. Others are specialists like Mental Health Nurses and Emergency Nurses.

3.3 Study Population

ANC nurses and midwives were used as the population in the study. ANC nurses are registered general nurses who have not specialized as midwives, and yet, work at the ANC department of

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the health facility. The number of nursing staff (ANC nurses and midwives) working in the various health facilities identified are; 23 nursing staff at Kintampo Municipal Hospital, 16 nursing staff at Yizura Hospital, 10 nursing staff at Sunkwa Clinic, 18 nursing staff at Glory 29 Prince of Peace Maternity, 4 nursing staff in Babatokuma CHPS, 5 nursing staff in Atta Akura CHPS, 4 nursing staff in Dawadawa CHPS, 6 nursing staff in Asantekwaaa CHPS, 7 nursing staff in New Longoro Health Center, and 6 nursing staff in Busuama Health Center. This gives the total nursing staff (ANC nurses and midwives) to be 96.

3.4 Inclusion and Exclusion Criteria

The target population that were included in the study were nurses and midwives who work at the antenatal care (ANC) departments of the following healthcare facilities located in the Kintampo North Municipality; Kintampo Municipal Hospital, Yizura Hospital, Sunkwa Clinic, Glory Prince of Peace Maternity, Babatokuma CHPS, Atta Akura CHPS, Dawadawa CHPS, Asantekwaaa CHPS, New Longoro Health Center, and Busuama Health Center These facilities are all in the.

Nurses and midwives who don't work in hospitals in Kintampo North Municipality were excluded from the list. Additionally, the study did not include any nurses or midwives who were employed by any medical institution in the Kintampo North Municipality that was not one of the establishments listed in the inclusive criteria. In addition, the study did not take into account nurses who work in the other departments of the health facilities included as part of the inclusion criteria.

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3.5 Description of Study Variables

In this study, the independent variable was the quality of antenatal care (ANC) and the dependent variable was the knowledge and practices of ANC nurses. This was because the quality of ANC is independent on knowledge and practices.

3.6 Sample Size Determination

Since the target population was not a sizable one, the sample size for the study was established using the census approach. As a result, 96 ANC nurses and midwives from the health facilities that met the study's inclusion criteria were sampled.

3.7 Sampling Procedure

Convenient sampling techniques were highly recognized for this investigation, even if the census method of sampling was used. This was due to the fact that the easy sampling approach only allowed for those target population members to be sampled who were accessible and willing to participate in the study.

3.8 Data Collection Techniques

Data collection was done in one week using an anonymous self-administered questionnaire. The questionnaire consisted of close-ended multiple-choice questions. Before giving questionnaire to respondents, consent to participate in the study was sought from nurses and midwives who met the inclusion criteria. After providing informed consents, respondents were given the questionnaire and were encouraged to be patient in reading for complete understanding in order to provide frank responses. Answered questionnaires were received on same day or left with respondents for later collection.

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3.9 Quality Control Assurance

Content validity of the questionnaire for the study was enhanced by allowing my research supervisor and a midwifery officer to go through them and make suggestions for consideration. To enhance internal consistency, the reliability of the questionnaire was tested after the pretest. It was ensured that the subjects' responses to the questionnaire were not influenced by others. 31 Attention was paid when entering data into SPSS version 25 for analysis. This helped the researcher enter data as rightly coded to represent the true responses of subjects. The appropriate statistical instrument was used to analyze the data to be able to draw appropriate inferences on the study.

3.10 Data Processing and Management

The participant-provided data were handled and evaluated using IBM's statistical program for social sciences (SPSS) version 25. The data was entered using IBM SPSS Statistics 25. A computer, in addition to other devices including a hard drive and a pen drive, was used to store the participant data. The information was password-protected to ensure privacy. The physical copies were kept in a file for future use, should the need arise, and then placed in a seldom-used bag.

3.11 Data Analysis

With the aid of IBM's statistical package for social sciences (SPSS) version 25 software, the participant-provided data was examined. The IBM SPSS Statistics 25 program was used to enter the data. Frequency tables and charts were used to provide a descriptive summary of the entered data. The level of job knowledge among respondents was classified as poor, moderate, or high. Below 50% = poor (terrible), between 50% and 50% = average (mediocre), and above 50% = high (excellent) knowledge and practice were the percentage ratings for the replies.

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3.12 Study Limitations

Though the study population was ANC nurses and midwives, the outcome of the study could be influenced by the years of working experience, maturity level, and other factors that might not be 32 known and could not be controlled by the researcher. A descriptive cross-sectional study did not provide the opportunity for the outcomes to be statistically tested.

3.13 Ethical Considerations

An introduction letter was requested from the University of Ghana's Department of Health Policy, Planning and Management. This letter was sent to the Ghana Health Service (GHS) for ethical clearance to conduct this study. Approval letter with reference number GHS/RDD/ERC/Admin/App/22/399 was given by GHS to conduct the study. The approval letter was sent to the administrations of the Kintampo Municipal Hospital, Yizura Hospital, Sunkwa Clinic, Glory Prince of Peace Maternity, Babatokuma CHPS, Atta Akura CHPS, Dawadawa CHPS, Asantekwaaa CHPS, New Longoro Health Center, and Busuama Health Center. Permission to collect data was given by these healthcare facilities.

Both verbal and written consent was obtained by allowing participants to sign a consent form for the study. For reasons of secrecy, respondents were not required to sign their names on the questionnaire. They were informed that they could withdraw their permission from the study at any moment and that doing so would not have any negative consequences for them. To safeguard the confidentiality of the information gathered from respondents, the program was password-protected, and the hard copy was kept behind locked doors.

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CHAPTER FOUR

RESULTS

4.0 Introduction

The findings are reported in this chapter in order to address the study's goals. The administration and return of all 96 questionnaires resulted in a 100% response rate. The following research inquiries served as the foundation for the study's findings:

1. What is the knowledge level on ANC guidelines among nurses in Kintampo North Municipality?
2. What is the knowledge level of ANC nurses in Kintampo North Municipality on danger signs associated with pregnancy?
3. Do nurses in Kintampo North Municipality adhere to quality ANC practices during client's first visit?

4.1 Results

From Table 1 21 (21.9%) out of the 96 respondents were males and the reaming 75 (78.1%) were females. Age wise, 94 (97.9%) of the respondents were from the age of 25 to 34 years and 2 (2.1%) were from 35 to 44 years. On education qualification, 27 (28.1%) revealed that they had certificate as their educational qualification, 39 (40.6%) had diploma qualification, and 30 (31.3%) had degree qualification. In terms of working experience, 57 (59.4%) out of the 96 respondents had 1-2 years working experience, and the remaining 39 (40.6%) had 3-5 years working experience.

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Table 4.1: Demographic features of respondents (n=96)

Demographic feature	Frequency (N=96)	Percentage (%)
Gender		
Male	21	21.9
Female	75	78.1
Age (years)		
25-34	94	97.9
35-44	2	2.1
Educational qualification		
Certificate	27	28.1
Diploma	39	40.6
Degree	30	31.3
Working experience (years)		
1-2	57	59.4
3-4	39	40.6

Table 2 reveals that 57 (59.4%) of the 96 respondents agreed with the statement that ANC entails risk identification, the prevention and treatment of diseases connected to pregnancy or other problems that may occur concurrently, as well as health promotion and education. 39 people (40.6%) were in disagreement. The statement that ANC offers a substantial potential for the prevention and control of concurrent diseases through integrated care delivery was supported by 64 (66.7%) strongly and 32 (33.3%) moderately by respondents. According to 65 (67.7%) of the 96 respondents, the focused ANC (FANC) model is periodically administered in four critical periods throughout pregnancy, whereas the remaining 31 (32.3%) respondents agreed.

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FANC is based on the following five key themes in relation to the claim: nutritional treatments, maternal and fetal screening, preventive measures, interventions for common physiological complaints, and improvements to health systems to boost the use and quality of ANC. Despite the fact that 41 (42.7%) individuals indicated they concurred, 55 (57.3%) claimed they strongly agreed. 36 (37.5%) of the 96 respondents agreed that a healthy diet during pregnancy should include adequate calories, protein, vitamins, and minerals to meet the needs of both the mother and the fetus, while 54 (56.3%) and 6 (6.3%) disagreed. Additionally, 57 (59.4%) of the respondents strongly agreed that the majority of anemia reported in pregnant women is brought on by iron supplementation, whereas 39 (40.6%) of the respondents disagreed.

The 96 respondents were divided into 43 (44.8%) who strongly agreed, 46 (47.9%) who agreed, and 7 (7.3%) who disputed that vitamin C intake enhances iron absorption from the stomach. In addition, 44 (45.8%) strongly disagreed with the statement that malaria is a common cause of anemia in pregnant women, whereas 47 (49.0%) strongly agreed, 5 (5.2%) agreed, and 47 (49.0%) highly agreed. A healthy lifestyle includes aerobic physical activity and strength-conditioning exercise aimed at maintaining a good level of fitness throughout pregnancy, without trying to reach peak fitness level or train for athletic competition, according to 53 (55.2%) strongly agreed, 37 (38.5%) agreed, and 6 (6.3%) disagreed. Hb of 11g/dl is considered anaemia in pregnancy, according to 96 respondents, of whom 52 (54.2%) strongly agreed with the statement, 43 (44.8%) agreed, and 1 (1.0%) disagreed. Again, 13 (13.5%) strongly agreed that asymptomatic bacteriuria is a common urinary system problem associated with a higher risk of urinary tract infections (cystitis and pyelonephritis) in pregnant women, compared to 45 (46.9%) who disagreed and 25 (26.0%) who severely disagreed. Recurrent urinary tract infections, which

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are common in pregnant women and have been linked to unfavorable pregnancy outcomes, such as preterm birth and small-for-gestational-age neonates, were highly agreed upon by 49 (51.0%), 40 (41.7%), and 7 (7.3%) respondents. 43 (44.8%) strongly agreed, 7 (7.3%) disagreed, and 46 (47.9%) strongly agreed that rhesus (Rh) negative mothers can produce Rh antibodies if they give birth to a Rh-positive baby, causing the baby to experience hemolytic disease in later pregnancies. Furthermore, anti-D immunoglobulin is an efficient strategy to avoid RhD alloimmunization and hemolytic illness in the infant, according to 39 (40.6%) of the 96 respondents who agreed, 16 (16.7%) of whom disagreed, and 41 (42.7%) of whom strongly agreed.

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Table 4.2: Respondents' response on their knowledge on ANC guidelines (n=96)

Knowledge on ANC Guidelines	Frequency (N=96)	Percentage (%)
Components of ANC comprise: risk identification, prevention and management of pregnancy-related or concurrent diseases, and health education and health promotion.		
Strongly agree		
Agree	57	59.4
Disagree	39	40.6
Strongly disagree		
ANC provides an important opportunity to prevent and manage concurrent diseases through integrated service delivery		
Strongly agree	64	66.7
Agree	32	33.3
Disagree		
Strongly disagree		
Focused ANC (FANC) model is delivered periodically in four critical times during pregnancy		
Strongly agree	65	67.7
Agree	31	32.3
Disagree		
Strongly disagree		
FANC is based on the five main priorities: nutritional interventions, maternal and fetal assessment, preventive measures, interventions for common physiological symptoms, health systems interventions to improve the utilization and quality of ANC.		
Strongly agree	55	57.3
Agree	41	42.7
Disagree		

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Strongly disagree		

Table 4.2: Respondents' response on their knowledge on ANC guidelines (n=96) (cont'd)

Pregnancy requires a healthy diet that includes an adequate intake of energy, protein, vitamins and minerals to meet maternal and fetal needs		
Strongly agree	36	37.5
Agree	54	56.3
Disagree	6	6.3
Strongly disagree		
Most anaemia found in pregnant women is attributable to iron supplementation		
Strongly agree	57	59.4
Agree	39	40.6
Disagree		
Strongly disagree		
Vitamin C intake enhances iron absorption from the gut		
Strongly agree	43	44.8
Agree	46	47.9
Disagree	7	7.3
Strongly disagree		
Malaria is a common cause of anaemia in pregnant women		
Strongly agree	44	45.8
Agree	47	49.0
Disagree	5	5.2
Strongly disagree		

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Table 4.2: Respondents' response on their knowledge on ANC guidelines (n=96) (cont'd)

Healthy lifestyle includes aerobic physical activity and strength-conditioning exercise aimed at maintaining a good level of fitness throughout pregnancy, without trying to reach peak fitness level or train for athletic competition		
Strongly agree	53	55.2
Agree	37	38.5
Disagree	6	6.3
Strongly disagree		
Hb of 11g/dl is considered anaemia in pregnancy		
Strongly agree	52	54.2
Agree	43	44.8
Disagree	1	1.0
Strongly disagree		
Asymptomatic bacteriuria is a common urinary tract condition that is associated with an increased risk of urinary tract infections (cystitis and pyelonephritis) in pregnant women		
Strongly agree	13	13.5
Agree	13	13.5
Disagree	45	46.9
Strongly disagree	25	26.0
Recurrent urinary tract infection are common in women who are pregnant and have been associated with adverse pregnancy outcomes including preterm birth and small-for-gestational-age newborns		
Strongly agree	49	51.0
Agree	40	41.7
Disagree	7	7.3
Strongly disagree		

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Table 4.2: Respondents' response on their knowledge on ANC guidelines (n=96) (cont'd)

Rhesus (Rh) negative mothers can develop Rh antibodies if they have an Rh-positive newborn, causing haemolytic disease of the newborn in subsequent pregnancies		
Strongly agree	43	44.8
Agree	46	47.9
Disagree	7	7.3
Strongly disagree		
Administering anti-D immunoglobulin to Rh-negative women within 72 hours of giving birth to an Rh-positive baby is an effective way of preventing RhD alloimmunization and haemolytic disease of the newborn		
Strongly agree	41	42.7
Agree	39	40.6
Disagree	16	16.7
Strongly disagree		

From table 3, it could be noticed that out of the 96 respondents, 46 (47.9%) strongly agreed to the statement; blood pressure equal or greater than 140/90mmHg, 49 (51.0%) agreed, and 1 (1.0%) disagreed. Concerning the statement; bleeding from vagina, 44 (45.8%) strongly, 51 (53.1%) agreed and 1 (1.0%) disagreed. 84 (87.5%) out of the 96 respondents strongly agreed to detecting leucocytes in pregnant woman's urine during urine dipstick whiles the remaining 12 (12.5%) agreed. With regards to the statement; detecting glucose in pregnant woman's urine during urine dipstick, 61 (63.5%) indicated that strongly agree, 32(33.3) agreed and (3 (3.1%) said they disagreed. 42 (43.8%) out of the 96 respondents strongly agree to the statement;

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detecting malaria in blood sample of pregnant woman during malaria RDT but 46 (47.9%) and 8 (8.3%) agreed and disagreed, respectively. Also, 67 (69.8%) of the respondents strongly agreed that severe headache is a danger sign associated with pregnancy but 29 (30.2%) agreed. In terms of whether vision problems is a danger sign of pregnancy, 56 (58.3%) of the 96 respondents strongly agreed and 40 (41.7%) agreed. Also, 59 (61.5%) strongly agreed that high fever is a danger sign of pregnancy but 37 (38.5%) agreed. Concerning the statement; swollen hands or feet, 68 (70.8%) strongly agreed that it is a danger sign of pregnancy but 28 (29.2%) disagreed. 61(63.5%) out of the 96 respondents strongly agreed that reduced foetal movement is a danger sign of pregnancy, but 35 (36.5%) agreed. Again, 67 (69.8%) strongly agreed that breech presentation of foetus is a danger sign of pregnancy, 24 (25.0%) agreed, and 5 (5.2%) disagreed. 60 (62.5%) strongly agreed that incompetent cervix is a danger sign of pregnancy, 32 (33.3%) agreed, and 4(4.2%) disagreed. 45 (46.9%) strongly agreed that increased or decreased pH of pregnant woman's vagina is a danger sign to pregnancy, 45 (46.9%) agreed, and 6 (6.3%) disagreed.

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Table 4.3: Respondents' response on their knowledge on danger signs associated with pregnancy (n=96)

Knowledge on Danger Signs Associated with Pregnancy	Frequency (N=96)	Percentage (%)
Blood pressure equal or greater than 140/90mmHg		
Strongly agree	46	47.9
Agree	49	51.0
Disagree	1	1.0
Strongly disagree		
Bleeding from vagina		
Strongly agree	44	45.8
Agree	51	53.1
Disagree	1	1.0
Strongly disagree		
Detecting leucocytes in pregnant woman's urine during urine diptick		
Strongly agree	84	87.5
Agree	12	12.5
Disagree		
Strongly disagree		
Detecting glucose in pregnant woman's urine during urine diptick		
Strongly agree	61	63.5
Agree	32	33.3
Disagree	3	3.1
Strongly disagree		

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Table 4.3: Respondents' response on their knowledge on danger signs associated with pregnancy (n=96) (cont'd)

Detecting malaria in blood sample of pregnant woman during malaria RDT		
Strongly agree	42	43.8
Agree	46	47.9
Disagree	8	8.3
Strongly disagree		
Severe headache		
Strongly agree	67	69.8
Agree	29	30.2
Disagree		
Strongly disagree		
Vision problems		
Strongly agree	56	58.3
Agree	40	41.7
Disagree		
Strongly disagree		
High fever		
Strongly agree	59	61.5
Agree	37	38.5
Disagree		
Strongly disagree		
Swollen hands or feet		
Strongly agree	68	70.8
Agree	28	29.2

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Disagree		
Strongly disagree		

Table 4.3: Respondents' response on their knowledge on danger signs associated with pregnancy (n=96) (cont'd)

Reduced foetal movement		
Strongly agree	61	63.5
Agree	35	36.5
Disagree		
Strongly disagree		
Breech presentation of foetus		
Strongly agree	67	69.8
Agree	24	25.0
Disagree	5	5.2
Strongly disagree		
Incompetent cervix		
Strongly agree	60	62.5
Agree	32	33.3
Disagree	4	4.2
Strongly disagree		
Increased or decreased pH of pregnant woman's vagina		
Strongly agree	45	46.9
Agree	45	46.9
Disagree	6	6.3
Strongly disagree		

From table 4, it could be identified that out of the 96 respondents, 59 (61.5%) strongly agreed to the statement; providing women-held case notes to pregnant women, and health education and

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health promotion, 32 (33.3%) agreed, 3 (3.1%) disagreed and 2 (2.1%) disagreed. Concerning the statement; confirming pregnancy and calculate expected date of delivery (EDD) on the first ANC visit, 63 (65.6%) strongly agreed whiles 33 (34.4%) agreed. 68 (70.8%) out of the 96 respondents strongly agreed that classifies all women after the test results based on their condition on their first ANC visit should be done whiles the remaining 28 (29.2%) agreed. With regards to the statement; taking history including psychosocial history during the first ANC visit, 55 (57.3%) indicated that strongly agree, 33 (34.4%) said they agreed and 8 (8.3%) disagreed. 68 (70.8%) out of the 96 respondents strongly agree to the statement; requesting for tests full blood count (FBC), urine routine examination (urine R/E), HIV, blood grouping, bacteriuria on the first ANC visit but 24 (25.0%) and 4 (4.2%) agreed and disagreed, respectively. Also, 55 (57.3%) of the respondents strongly agreed that administering tetanus toxoid vaccine, iron and folate during the first ANC visit should be doen but 41 (42.7%) agreed. In terms of whether providing health education including education on birth and emergency plan during the first ANC visit should be done, 62 (64.6%) of the 96 respondents strongly agreed, 24(25.0%) agreed, and the remaining 10 (10.4%) disagreed. Also, 76 (79.2%) strongly agreed that checking for foetal growth, blood pressure (BP), anaemia, and foetal movement during the second ANC visit should be done. Concerning the statement; administering antihelminthic, antiretroviral (ARV) if eligible, and treat bacteriuria if indicated during the secon ANC visit, 54 (56.3%) strongly agreed and 42 (43.8%) agreed. 57 (59.4%) out of the 96 respondents strongly agreed checking for the presence of bacteriuria on the third ANC visit should be done, 37 (38.5%) agreed and 2 (2.1%) disagreed. Again, 55 (57.3%) strongly agreed to that providing information on birth and emergency plan, infant feeding, postpartum or postnatal care, pregnancy spacing during the fourth ANC visit should be done, 37 (38.5%) agreed, and 4 (4.2%) disagreed.

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Table 4.4: Respondents' responses on quality of ANC practices

Quality ANC Practices	Frequency (N=96)	Percentage (%)
Providing women-held case notes to pregnant women		
Strongly agree	59	61.5
Agree	32	33.3
Disagree	3	3.1
Strongly disagree	2	2.1
Confirming pregnancy and calculate expected date of delivery (EDD) on the first ANC visit		
Strongly agree	63	65.6
Agree	33	34.4
Disagree		
Strongly disagree		
Classifies all women after the test results based on their condition on their first ANC visit		
Strongly agree	68	70.8
Agree	28	29.2
Disagree		
Strongly disagree		
Taking history including psychosocial history during the first ANC visit		
Strongly agree	55	57.3
Agree	33	34.4

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Disagree	8	8.3
Strongly disagree		

Table 4.4: Respondents' responses on quality of ANC practices (cont'd)

Requesting for tests full blood count (FBC), urine routine examination (urine R/E), HIV, blood grouping, bacteriuria on the first ANC visit		
Strongly agree	68	70.8
Agree	24	25.0
Disagree	4	4.2
Strongly disagree		
Administering tetanus toxoid vaccine, iron and folate during the first ANC visit		
Strongly agree	55	57.3
Agree	41	42.7
Disagree		
Strongly disagree		
Providing health education including education on birth and emergency plan during the first ANC visit		
Strongly agree	62	64.6
Agree	24	25.0
Disagree	10	10.4
Strongly disagree		
Checking for foetal growth, blood pressure (BP), anaemia, and foetal movement during the second ANC visit		
Strongly agree	76	79.2
Agree	20	20.8
Disagree		
Strongly disagree		

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Table 4.4: Respondents' responses on quality of ANC practices (cont'd)

Administering antihelminthic, antiretroviral (ARV) if eligible, and treat bacteriuria if indicated during the secon ANC visit		
Strongly agree	54	56.3
Agree	42	43.8
Disagree		
Strongly disagree		
Checking for the presence of bacteriuria on the third ANC visit		
Strongly agree	57	59.4
Agree	37	38.5
Disagree	2	2.1
Strongly disagree		
Providing information on birth and emergency plan, infant feeding, postpartum or postnatal care, pregnancy spacing during the fourth ANC visit		
Strongly agree	55	57.3
Agree	37	38.5
Disagree	4	4.2
Strongly disagree		

Table 5 summarizes cumulative responses on objectives of the study. From table 5, it could be identified that out of the 1344 responses gathered from all questions under the objective "Knowledge on ANC guidelines among nurses in Kintampo North Municipality", 615 (45.8%)

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indicated they strongly agreed to the statements under the said this objective, 565 (42.0%) agreed, 139 (10.3%) disagreed, and 25 (1.9%) strongly disagreed.

Also, out of the 1248 responses received on the objective "knowledge of ANC nurses in Kintampo North Municipality on danger signs associated with pregnancy", 720 (57.7%) strongly agreed, 494 (39.6%) agreed, and 34 (2.7%).

Also, out of the 1152 responses received on the objective "practice of quality ANC provided by ANC nurses during clients' first visit at the Kintampo North Municipality", 734 (63.7%) strongly agrees, 375 (32.6%) agreed, 41(3.6%) disagreed, and 2 (0.2%) strongly disagreed.

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Table 5.5: Participants' cumulative responses on objectives

Objective	N	Frequency	Percentage (%)
Knowledge on ANC Guidelines	1344		
Strongly agree		615	45.8
Agree		565	42.0
Disagree		139	10.3
Strongly disagree		25	1.9
Knowledge on Danger Signs Associated with Pregnancy	1248		
Strongly agree		720	57.7
Agree		494	39.6
Disagree		34	2.7
Strongly disagree			
Quality ANC Practices	1152		
Strongly agree		734	63.7
Agree		375	32.6
Disagree		41	3.6
Strongly disagree		2	0.2

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CHAPTER FIVE

DISCUSSION AND RECOMMENDATION

In this chapter, we discussed the findings from the study and presented recommendations.

5.1 Discussion

5.1.1 Knowledge on ANC Guidelines

As can be seen from the literature, Carroli, Rooney, and Villar (2001) defined prenatal care (ANC) as the assistance given to expectant mothers by trained medical professionals in order to promote the best possible health outcomes for both mother and child throughout pregnancy. In addition, Carroli, Rooney, and Villar highlighted the following elements as part of ANC: risk assessment, disease prevention and care for women with concurrent or linked illnesses, health promotion and education. When asked whether risk identification, the prevention and management of diseases associated with pregnancy or other concurrent conditions, as well as health promotion and education, are elements of ANC, nearly half of the respondents (40.6%) disagreed. Though majority (59.4%) agreed that the components mentioned are components of ANC, the percentage that disagreed could be said to be significant. This is because, not knowing the components of ANC could be a gap in their knowledge concerning ANC and as such, affect

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their delivery of ANC care to pregnant women. Even if only one midwife's knowledge about the components of ANC is inconsistent with the standard body of knowledge, it could be serious because this midwife could provide below standard ANC to several pregnant women (per the midwife client ratio in Ghana). Also having 40.6% respondents demonstrating inappropriate knowledge concerning the components of ANC could be linked to majority (59.4%) of the respondents having less years of working experience (from 1-2 years) as well as combined majority (68.7%) having certificate (28.1%) and (40.6%). This finding could be an affirmation to the proposition that the more the years working experience, the more knowledgeable one becomes on the job description; similarly, the higher the education caveats, the more knowledgeable one becomes. From the other findings of this study, it could be said that the 40.6% respondents demonstrating inappropriate knowledge concerning the components of ANC may not have reflected their understanding of the statement. This is due to the fact that from the data at hand, all (100%) of the respondents indicated they strongly agree or agree (with majority strongly agreeing in all instances) to the statements: The majority of anemia in pregnant women can be attributed to iron supplementation. The Focused ANC (FANC) model is based on the five main priorities of nutritional interventions, maternal and fetal assessment, preventive measures, interventions for common physiological symptoms, and health system. FANC is administered periodically during four crucial times during pregnancy. Through the implementation of integrated services, ANC presents a significant opportunity for the prevention and management of concomitant diseases. This is appropriate, according to Lincetto, Mothebesoane-Anoh, and Munjanja (2016) and the World Health Organization (WHO, 2015).

Nutrition is very important for a normal physiological response of the women throughout pregnancy as well as the normal physiological and anatomical development of the unborn baby.

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In that regard, many recommendations concerning maternal nutrition have been proposed by WHO and other authors. For instance, according to WHO (2016) and Tang, Chung, Dong, and Terrin (2016), a balanced diet during pregnancy must include an adequate consumption of calories, protein, vitamins, and minerals to suit the needs of both the mother and the fetus. However, it was unexpected to learn from the data at hand that 6.3% of respondents disagree that a nutritious diet is crucial for meeting the demands of the mother and the fetus. It was not surprising to learn that 7.3% of respondents disagreed that consuming vitamin C improves iron absorption from the stomach after learning that 6.3% of respondents had incorrect information of the nutritional demands of pregnant women. It is evident from the results that 37.5% and 56.3% of respondents strongly agreed and agreed that nutrition is crucial for meeting maternal and fetal needs, respectively. The small number of respondents who disagreed, however, may be unsettling. This is because pregnant women attending ANC would receive false information about nutrition if a single midwife who has insufficient knowledge of maternal nutritional needs provided that education. The pregnant woman's and unborn child's health could be seriously endangered by this.

According to Smaill and Vazquez (2015) and Schmiemann, Kniehl, Gebhardt, and Matejczyk, asymptomatic bacteriuria (ASB), a common urinary tract condition, is connected to an elevated risk of urinary tract infections (cystitis and pyelonephritis) in pregnant women (2010). However, 46.9% and 26.0% of respondents disagreed and strongly disagreed, respectively, with this statement. Asymptomatic bacteriuria (ASB) is a common urinary tract condition that is connected to an increased risk of urinary tract infections (cystitis and pyelonephritis) in pregnant women. A significant result since these midwives might not treat pregnant women who have asymptomatic bacteriuria until they discover it through standard urine testing. As a result, the

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pregnant woman may contract a major urinary tract infection, such as syphilis, gonorrhea, and others, which could result in the baby being born blind or suffering from other conditions.

If a mother is rhesus (Rh) negative and has a newborn who is Rh positive, she runs the risk of developing anti-Rh antibodies, which can result in HDN in subsequent pregnancies. RhD alloimmunization and HDN can be avoided by delivering anti-D immunoglobulin to Rh-negative women within 72 hours of giving birth to a Rh-positive child, according to McBain, Crowther, and Middleton's (2015) research. However, based on the available data, 16.7% of the respondents disagreed that delivering anti-D immunoglobulin to Rh-negative mothers within 72 hours of giving birth to an Rh-positive baby is a successful method of preventing RhD alloimmunization and infant hemolytic illness. This may have the effect of preventing a midwife from giving anti-D immunoglobulin to Rh-negative women when it is required. As a result, expectant women who become victims of this may experience threatening and unavoidable miscarriages in their successive pregnancies.

Table 5 shows that the majority (87.8%) of the cumulative replies to the question on respondents' knowledge of ANC guidelines were in line with respondents' current understanding of those guidelines. The combined minority of the responses that do not follow current knowledge of ANC principles is thus 12.2%. The study's conclusion is consistent with that of Mahmoud et al. (2020), who found that 70% of the nurses had adequate awareness of ANC standards. Despite the similarities in results between the two studies, Mahmoud et al. investigation.'s was carried out in Egypt, whereas this one was done in Ghana. The variation in setting could be crucial to the extent that it affects the midwife-client ratio. Finding 12.2% of midwives in Ghana who exhibit knowledge conflicting with ANC recommendations could have a big impact. This is due to the low number of midwives in Ghana, where it would have been expected that they would have up-

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to-date knowledge of ANC standards to aid enhance the health of expectant mothers and their unborn infants for a safe birth. The percentage of midwives who have uneven awareness of ANC recommendations may give pregnant women inconsistent health advice or neglect to intervene appropriately in cases of pregnancy-related life-threatening illnesses.

5.1.2 Knowledge on Danger Signs Associated with Pregnancy

A significant tool midwives and nurses have to improve the health of pregnant women and their unborn children is accurate knowledge of the risk indications related to pregnancy. With precise knowledge of the risks associated with pregnancy, midwives and nurses may recognize these risks as quickly as possible and take necessary action to mitigate the effects that follow (WHO, 2016). Based on the collected data, it was discovered that every single respondent (100%) believed that the presence of leucocytes in a pregnant woman's urine when using a urine dipstick, a severe headache, vision issues, a high fever, swollen hands or feet, and a decrease in the movement of the fetus were all warning signs of pregnancy. While the respondents' levels of agreement varied, the majority of them strongly felt that such features were warning signals of pregnancy. That is to say, 87.5% strongly agreed that finding leucocytes in a pregnant woman's urine while using a urine dipstick is a warning indication of pregnancy (based on the available data). Similarly, a substantial majority of respondents (69.8%, 58.3%, 61.5%, 70.8%, and 63.5%) agreed that pregnancy-related risk signals include severe headache, eyesight issues, high temperature, swollen hands or feet, and decreased foetal movement. This is in line with WHO's (2015) assertion that the risks linked with pregnancy include the aforementioned variables. Aside from the aforementioned elements, WHO (2015) suggested that other danger signs associated

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with pregnancy include blood pressure equal or greater than 140/90mmHg, vaginal bleeding, detecting glucose in a pregnant woman's urine during urine dipstick, detecting malaria in a pregnant woman's blood sample during malaria RDT, breech presentation of the foetus, and an incompetent cervix. The majority of respondents agreed that blood pressure equal to or higher than 140/90mmHg, vaginal bleeding, the detection of glucose in a pregnant woman's urine during a urine diptick, the detection of malaria in a pregnant woman's blood sample during a malaria RDT, the presentation of the fetus in breech position, and an incompetent cervix are all danger signs of pregnancy. According to the collected data, 1.0% disputed that vaginal bleeding and blood pressure that is equivalent to or higher than 140/90mmHg are warning indications of pregnancy. As for whether detecting glucose in a pregnant woman's urine during a urine diptick, detecting malaria in a pregnant woman's blood sample during a malaria RDT, a breech presentation of the foetus, and an incompetent cervix being danger signs of pregnancy, 3.1%, 8.3%, 5.2%, and 4.2% of the respondents disagreed, respectively. It may be claimed that only a small percentage of respondents disagree with the notion that these elements are pregnancy danger indications, and that this small percentage is nonetheless significant. Although the statistical validity of the significance attached to the researcher's findings was not established, it is possible that the situation is attributable to the lives of the people involved. Pre-eclampsi, a condition that is dangerous to both the pregnant mother and the unborn child, could develop if a midwife fails to recognize that blood pressure equal or more than 140/90mmHg is a danger indication of pregnancy and administer measures to lower the pregnant woman's blood pressure (2015). Similar to this, finding glucose in a pregnant woman's urine during a urine diptick could be a symptom of diabetes, which if left untreated could have an impact on both the health of the pregnant mother and her unborn child. In order to receive quick and effective treatment, malaria

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in pregnancy should be regarded as an emergency, according to Sobhy, Rogozinska, and Khan (2016) and WHO (2015). This is a result of how malaria can exacerbate anemia and its complications. As a result, the pregnant woman's and/or the unborn child's lives could be at risk if the midwife is unable to recognize and treat malaria in the pregnant woman. Additionally, incompetent cervix threatens abortion, hence all pregnant women with incompetent cervix should be forced to remain in bed, according to WHO (2015). If a midwife does not recognize an incompetent cervix as a risk indicator to pregnancy, she may not take the necessary precautions to help save the pregnancy, which may inevitably lead to an abortion. Table 5 shows that, overall, the majority of replies (97.3%) were in agreement with knowledge of the danger signals linked with pregnancy, whereas the remaining 2.7% of responses were in disagreement with the characteristics that were considered danger indications associated with pregnancy. Although this result could be regarded as favorable, the 2.7% of replies that were discordant with understanding of pregnancy danger indicators could be hazardous. This is due to the fact that a midwife's failure to recognize or recognize but disregard as a danger indicator to pregnancy might seriously endanger the health of the pregnant woman and the unborn child, potentially leading to maternal or fetal morbidity or fatality.

5.1.3 Quality ANC Practices

Antenatal care (ANC) is essential for promoting health, preventing sickness, screening for and treating disease, and other conditions, according to WHO (2021). In this way, ANC seeks to decrease pregnancy and birthing problems, as well as stillbirths and perinatal mortality, by providing high-quality healthcare and integrating prenatal care. From the data obtained, all (100%) the respondents indicated quality ANC services by strongly agreeing and agreeing to the following ANC practices: confirming pregnancy and calculate expected date of delivery (EDD)

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on the first ANC visit; classifies all women after the test results based on their condition on their first ANC visit; administering tetanus toxoid vaccine, iron and folate during the first ANC visit; checking for foetal growth, blood pressure (BP), anaemia, and foetal movement during the second ANC visit; and administering antihelminthic, antiretroviral (ARV) if eligible, and treat bacteriuria if indicated during the second ANC visit. Out of the 100% majority of the respondents strongly agreed that the above-mentioned practices should be adhered to during ANC visit by pregnant women. Specifically, from the data obtained, 65.6% strongly agreed to confirming pregnancy and calculate expected date of delivery (EDD) on the first ANC visit; 70.8% strongly agreed to classifies all women after the test results based on their condition on their first ANC visit; 57.3% strongly agreed to administering tetanus toxoid vaccine, iron and folate during the first ANC visit; 79.2% strongly agreed to checking for foetal growth, blood pressure (BP), anaemia, and foetal movement during the second ANC visit; and 56.3% also strongly agreed to administering antihelminthic, antiretroviral (ARV) if eligible, and treat bacteriuria if indicated during the second ANC visit. It must also be emphasized that there were some other quality ANC practices (according to WHO, 2021) which respondents disagreed should be practiced during ANC visit by pregnant women. These practices are providing women-held case notes to pregnant women (3.1% disagreeing and 2.1%); taking history including psychosocial history during the first ANC visit (8.3% disagreeing); requesting for tests full blood count (FBC), urine routine examination (urine R/E), HIV, blood grouping, bacteriuria on the first ANC visit (4.2% disagreeing); providing health education including education on birth and emergency plan during the first ANC visit (10.4% disagreeing). The third ANC appointment should include testing for bacteriuria (2.1% disagree); the fourth ANC visit should include information on birth and emergency plans, newborn feeding, postpartum or postnatal care, and

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spacing out pregnancies (4.2% disagree). According to WHO, disagreeing with some of these high-quality ANC procedures may be extremely concerning and hazardous to the health of the expectant mother and her unborn child (2021). For instance, failure of midwife to confirm pregnancy could result in false pregnancy signs and symptoms like utrine myoma and not calculating expected date of delivery (EDD) on the first ANC visit means the midwife may also not give attention to helping the pregnant woman plan towards her delivery period. Also, failure of midwife to request for tests full blood count (FBC), urine routine examination (urine R/E), HIV, blood grouping, bacteriuria on the first ANC visit could also put the health of the pregnant woman and the unborn child in danger. This is in the sense that, failure to detect any of these diseases or ailment when present means there would be no interventions to treat them. According to WHO (2021), it is very important to providing health education including education on birth and emergency plan during the first ANC visit. If a midwife fails to do this, then it means the pregnant women, especially first-time pregnant women, would have no education concerning nutrition, exercise, planning towards pregnancy, family planning and other pertinent teaching pregnant women are to be provided during their first ANC visit. Moreover, not providing information on birth and emergency plan, pregnancy spacing during the fourth ANC visit could also lead to pregnant women becoming pregnant again shortly after delivery. This will result in short spacing interval between their children and predisposes them to anaemia, bleeding, eclampsia, and other critical health conditions together with economic and social implications.

From table 5, it was evident that combined majority (96.3%) of the cumulated responses were responses that demonstrates quality ANC practices and the remaining 3.7% demonstrating services of ANC that are below standard of practice. The 3.7% depicting practices that are below par to quality ANC practices could be serious. This is because, providing poor ANC service to

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one pregnant woman may result her not having interest in visiting the health facility for ANC and in turn, propagate this news to her colleague pregnant women. This could result in significant number of pregnant women to attending ANC and as such, fighting against the effort to reduce and eradicate maternal and/ or feotal morbidity and mortality. The findings of this study is in contradiction with the study of Amoakoh-Coleman et al. (2016) which was also conducted in Ghana. In the study, Amoakoh-Coleman et al. revealed that only 48.5% of midwives adhered to quality ANC practices which resulted in their suggestion that in-service training and education should be provided to nurses and midwives concerning quality ANC practices. One could intimate that the suggestion of Amoakoh-Coleman et al. were carried out since it has been clearly evident in this study better results have been achieved thereafter.

5.2 Limitations of the Study

Though the study population was ANC nurses and midwives, outcome of the study could be influenced by the years of working experience, maturity level, and other factors that might not be known and could not be controlled by the researcher.

5.3 Summary, Conclusions and Recommendations

The study's goal was to ascertain the effects of high-quality ANC provided by ANC nurses in medical facilities in Kintampo North Municipality. The following research questions served as the study's compass:

1. What is the knowledge level on ANC guidelines among nurses in Kintampo North Municipality?
2. What is the knowledge level of ANC nurses in Kintampo North Municipality on danger signs associated with pregnancy?

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3. Do nurses in Kintampo North Municipality adhere to quality ANC practices during client's first visit?

Using self-administered questionnaires, data were gathered. The mode of data collecting used was descriptive. The Kintampo North Municipality served as the study's site. Nurses who work at the ANC or midwives made up the study's population. Data from the respondents were gathered using a practical sampling technique. Based on the entire sample size, 96 questionnaires were printed. Of those, 96 were administered and received a return rate of 100%. The data was analyzed using IBM SPSS software, version 25.

5.3.1 Summary

Knowledge on ANC Guidelines

Majority of the cumulated responses on statement seeking respondents' knowledge on ANC guidelines were consistent with current knowledge concerning ANC guidelines. This leaves a minority of the responses not being consistent with current knowledge of ANC guidelines. The fraction of midwives with inconsistent knowledge of ANC guidelines may provide inconsistent health education to pregnant women or fail to provide appropriate intervention for life-threatening conditions associated with pregnancy.

Knowledge on Danger Signs Associated with Pregnancy

Majority of the cumulative responses were consistent with knowledge concerning danger signs associated with pregnancy whereas the reaming of the responses were disagreement with the factors that were danger signs associated with pregnancy. Whiles this finding could be said to be positive, the few of the responses that were inconsistent with knowledge on danger signs associated with pregnancy could be dangerous. This is because, failure of midwife to identify or

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identify but consider as danger sign to pregnancy could put the health status of pregnant woman and the baby in danger; to the extreme, causing maternal and or fetal morbidity or mortality.

Quality ANC Practices

It was evident that combined majority (96.3%) of the cumulated responses were responses that demonstrates quality ANC practices and the remaining 3.7% demonstrating services of ANC that are below standard of practice. The 3.7% depicting practices that are below par to quality ANC practices could be serious. This is because, providing poor ANC service to one pregnant woman may result her not having interest in visiting the health facility for ANC and in turn, propagate this news to her colleague pregnant women. This could result in significant number of pregnant women to attending ANC and as such, fighting against the effort to reduce and eradicate maternal and/ or foetal morbidity and mortality.

5.3.2 Conclusion

Knowledge on ANC Guidelines

According to the data presented on table 5 concerning respondents' knowledge on ANC guidelines, the study could be said to have answered the question, "What is the knowledge level on ANC guidelines among nurses in Kintampo North Municipality?" which served as one of the guides to the study.

This is because more than half (87.8%) of the responses from respondents consistent with knowledge on ANC guidelines and the researcher can therefore assert that more than 50% of nurses in Kintampo North Municipality have good knowledge on ANC guidelines.

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Knowledge on Danger Signs Associated with Pregnancy

The data summary on table 5 regarding knowledge on danger signs associated with pregnancy revealed that the question, "What is the knowledge level of ANC nurses in Kintampo North Municipality on danger signs associated with pregnancy?" which served as one of the guide to this study has been well answered. This is because per the data at hand, majority (97.3%) of respondents' responses were consistent with knowledge on danger signs associated with pregnancy.

In light of that, the researcher could say that the more than 50% of nurses in Kintampo North Municipality have good knowledge on danger signs associated with pregnancy.

Quality ANC Practices

The data summary on table 5 concerning quality ANC practices revealed that the question, "Do nurses in Kintampo North Municipality adhere to quality ANC practices during client's first visit?" which served as one of the guides to this study has been well answered. This is due to the fact that, per the data at hand, majority (96.3%) of respondents' responses indicated practices that were at par with quality ANC practices.

Pursuance to that, the researcher could conclude that more than 50% of nurses in Kintampo North Municipality adhere to quality ANC practices during client's first visit.

5.3.3 Recommendations

Per the literature reviewed, it was observed that few studies have been conducted concerning midwives' knowledge and adherence to quality ANC practices. The researcher would, in that regard, recommend that more studies are conducted on this subject concerning the topic of this study and other pertinent topics on ANC. Trying methods used on studies on same topic but in

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different country could also help healthcare personnel and policy makers to know midwives' knowledge gaps as well as their discrepancies concerning ANC and as such, provide appropriate education to the midwives. Hence, studies in Ghana using such methods as used outside Ghana are recommended.

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APPENDIX A: CONSENT FORM

STUDY TITLE: Impact evaluation of the quality of antenatal care (ANC) offered by health care providers at Kintampo North Municipality

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (English). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant……..

Participants' Signature ……...OR Thumb Print……

Date: ……

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the forenamed participant to the best of my ability in the language (English) to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

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Name of Interpreter……

Signature of Interpreter…….. OR Thumb Print …….....

Date: ……

Contact Details: ……

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (English)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name: ……

Signature…….... OR Thumb Print …….....

Date: ……

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name: Adolphine Adofowa Kwarteng

Signature …….

Date…….

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APPENDIX B: RESEARCH QUESTIONAIRE

I am a final year student of the School of the University of Ghana, and I am conducting a research on the topic**; impact evaluation of the quality of antenatal care (ANC) offered by health care providers at Kintampo North Municipality.** Please accept to answer these questions which will enable me draw a representative inference on the topic with respect to the population. Please be assured that all information you provide will be confidential. Kindly sign or thumb print …… if you accept to answer this questionnaire.

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender: Male [ ] Female [ ]

2. Age (years) 20-24 [ ] 25-34 [ ] 35-44 [ ] 45-60 [ ] Above 60 [ ]

3. Highest Education Qualification: Certificate [ ] Diploma [ ] Degree [ ]
   Master's Degree [ ]

4. How long have you been practicing nursing?

   < 1 year [ ] 1-2 years [ ] 3-4 years [ ] 5 or more years [ ]

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SECTION B: KNOWLEDGE ON ANC GUIDELINES

Demonstrate your knowledge on ANC Guidelines by ticking to indicate whether you Strongly (SA), Agree (A), Disagree (D) or Strongly Disagree (SD) with the statement

No.	Knowledge on ANC Guidelines	SA	A	D	SD
1	Components of ANC comprise: risk identification, prevention and management of pregnancy-related or concurrent diseases, and health education and health promotion.				
2	ANC provides an important opportunity to prevent and manage concurrent diseases through integrated service delivery				
3	Focused ANC (FANC) model is delivered periodically in four critical times during pregnancy				
4	FANC is based on the six main priorities: nutritional interventions, maternal and fetal assessment, preventive measures, interventions for common physiological symptoms, health systems interventions to improve the utilization and quality of ANC.				
5	Pregnancy requires a healthy diet that includes an adequate intake of energy, protein, vitamins and minerals to meet maternal and fetal needs				
6	Most anaemia found in pregnant women is attributable to iron supplementation				
7	Vitamin C intake enhances iron absorption from the gut				
8	Malaria is a common cause of anaemia in pregnant women				
9	Healthy lifestyle includes aerobic physical activity and strength-conditioning exercise aimed at maintaining a good level of fitness throughout pregnancy, without trying to reach peak fitness level or train for athletic competition				
10	Hb of 11g/dl is considered anaemia in pregnancy				
11	Asymptomatic bacteriuria is a common urinary tract condition that is associated with an increased risk of urinary tract infections (cystitis and pyelonephritis) in pregnant women				
12	Recurrent urinary tract infection are common in women who are pregnant and have been associated with adverse pregnancy outcomes including preterm birth and small-for-gestational-age newborns				
13	Rhesus (Rh) negative mothers can develop Rh antibodies if they have an Rh-positive newborn, causing haemolytic disease of the newborn in subsequent pregnancies				

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14	Administering anti-D immunoglobulin to Rh-negative women within 72 hours of giving birth to an Rh-positive baby is an effective way of preventing RhD alloimmunization and haemolytic disease of the newborn				

SECTION C: KNOWLEDGE ON DANGER SIGNS ASSOCIATED WITH PREGNANCY

Demonstrate your knowledge on Danger Signs Associated with Pregnancy by ticking to indicate whether you Strongly (SA), Agree (A), Disagree (D) or Strongly Disagree (SD) with the statement

No.	Knowledge on Danger Signs Associated with Pregnancy	SA	A	D	SD
1	Blood pressure equal or greater than 140/90mmHg				
2	Bleeding from vagina				
3	Detecting leucocytes in pregnant woman's urine during urine diptick				
4	Detecting glucose in pregnant woman's urine during urine diptick				
5	Detecting malaria in blood sample of pregnant woman during malaria RDT				
6	Severe headache				
7	Vision problems				
8	High fever				
9	Swollen hands or feet				
10	Reduced foetal movement				
11	Breech presentation of foetus				
12	Incompetent cervix				
13	Increased or decreased pH of pregnant woman's vagina				

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SECTION D: KNOWLEDGE ON QUALITY ANC PRACTICES

Demonstrate your knowledge on Quality ANC Practices by ticking to indicate whether you Strongly (SA), Agree (A), Disagree (D) or Strongly Disagree (SD) with the statement

No.	Quality ANC Practices	SA	A	D	SD
1	Providing women-held case notes to pregnant women				
2	Confirming pregnancy and calculate expected date of delivery (EDD) on the first ANC visit				
3	Classifies all women after the test results based on their condition on their first ANC visit				
4	Taking history including psychosocial history during the first ANC visit				
5	Requesting for tests full blood count (FBC), urine routine examination (urine R/E), HIV, blood grouping, bacteriuria on the first ANC visit				
6	Administering tetanus toxoid vaccine, iron and folate during the first ANC visit				
7	Providing health education including education on birth and emergency plan during the first ANC visit				
8	Checking for foetal growth, blood pressure (BP), anaemia, and foetal movement during the second ANC visit				
9	Administering antihelminthic, antiretroviral (ARV) if eligible, and treat bacteriuria if indicated during the secon ANC visit				
10	Checking for the presence of bacteriuria on the third ANC visit				
	Providing information on birth and emergency plan, infant feeding, postpartum or postnatal care, pregnancy spacing during the fourth ANC visit				

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APPENDIX C: ETHICAL CLEARANCE GHANA HEALTH SERVICE

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
Ghana Health Service
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My Ref. GHS/RDD/ERC/Admin/App 122/399
Your Ref. No.

19th September, 2022

Adolphine Adofowa Kwarteng
Dormaa East District Health Directorate
P. O. Box 38, Wamfie

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 048/06/22**
Study Title	Impact Evaluation of the Quality of Antenatal Care (ANC) Offered by Health Care Providers at Kintampo North Municipality
Approval Date	19th September, 2022
Expiry Date	18th September, 2023
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Mr. Kofi Wellington
(GHS ERC Vice Chairperson)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra