WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DEPARTMENT OF NURSING

UTILIZATION OF EIGHT ANTENATAL CARE CONTACTS AND ASSOCIATED FACTORS AMONG POSTNATAL WOMEN IN GURAGE ZONE, CENTERAL ETHIOPIA, 2024

BY: - AMINAT ALI (BSc MW, MSc STUDENT)

A RESEARCH THESIS REPORT SUBMITTED TO WOLKITE UNIVERSITY, COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF NURSING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR A MASTER'S DEGREE IN MATERNITY AND REPRODUCTIVE HEALTH NURSING

JANUARY, 2025

WOLKITE, ETHIOPIA

WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DEPARTMENT OF NURSING

UTILIZATION OF EIGHT ANTENATAL CARE CONTACTS AND ASSOCIATED FACTORS AMONG POSTNATAL WOMEN IN GURAGE ZONE, CENTERAL ETHIOPIA 2024

BY: AMINAT ALI (BSc MW, MSc student)

ADVISORS: Mrs. ESKEDAR DEMISSIE (MSc, Assistant professor)

Mr. WUBISHET TESFAYE (MSc, Assistant professor)

JANUARY, 2025

WOLKITE, ETHIOPIA

APPROVAL SHEET

WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

We hereby certify that we have read and evaluated this thesis titled "Utilization of Eight Antenatal Care Contacts and associated factors among postnatal women in Gurage zone, Central Ethiopia 2024" prepared under our guidance by Aminat Ali Adem. We recommended that the thesis shall be submitted as a fulfilling the requirements for the award of MSc degree in Maternity and Reproductive Health Nursing.

Submitted by: - Aminat Ali Signature_____ Date_____

Approved by: -Research Advisors

Major Advisor _____ Signature _____ Date _____

Co-Advisor_____ Signature _____ Date_____

As members of the bord of examiners of the master of science thesis open defense examination, we hereby certify that the thesis is accepted for fulfilling for the requirements for the award of a master in maternity and reproductive health nursing.

Internal Examiners _____ Signature _____ Date_____

External Examiners_____ Signature _____ Date_____

Chair Person _____ Signature _____ Date_____

DGC/Chairman _____ Signature _____ Date_____

Final approval and acceptance of the thesis is contingent upon the submission of its final copy to the postgraduate council (PGC) through the candidate's department or school of under graduate and graduate studies (DGC or UG &GS).

ACKNOWLEDGMENT

I would like to thank Wolkite University College of Medicine and Health Science, department of Nursing for arranging a suitable environment to conduct this research thesis. I would like to forward my gratitude to Mrs. Eskedar Demissie and Mr. Wubishet Tesfaye for giving me help and advice that has significance to the development of this thesis. I would like thank friends for their support during this research endeavor. Finally, yet importantly, I would like to express my deepest gratitude to the OB/GYN department staffs and human resource management of Wolkite University Referral Hospital, Attat primary hospital and Gunchire primary hospital as well as Gurage Zone Health office for their willingness and cooperation to give me background information about the hospitals and the zones.

Table of contents

Contents **page**

List of Tables

List of Figures

DECLARATION

The research thesis is utilization of eight antenatal care contacts and associated factors among postnatal women in Gurage zone, Central Ethiopia 2024. The undersigned declare that this MSc research project is my original work. The thesis proposal is my original work, has not been presented for a degree in any other University and that all sources of materials used for thesis proposal has been duly acknowledged.

Principal investigator:

Aminat Ali (BSc M W, MSc candidate) Signature _____ Date: _____

LISTS OF ACRONYMS AND ABBREVIATIONS

ANC	Antenatal Care
EDHS	Ethiopia Demographic Health Survey
GYN /OBS	Gynecology and Obstetric
HIV	Human Immunodeficiency Virus
LMICs	Low -and Middle-Income Countries
MMR	Maternal Mortality Rate
SDG	Sustainable Developmental Goal
SSA	Sub Saharan Africa
TB	Tuberculosis
UN	United Nation
WHO	World Health Organization
WKUSH	Wolkite University Specialized Hospital
WKU	Wolkite University

ABSTRACT

Background: Antenatal care refers to the care provided by skilled healthcare professionals to a woman from the start of her pregnancy until the onset of labor. It serves as a gateway for pregnant women in order to receive a broad range of health promotion and preventive services, including screening for warning signs during pregnancy, delivery and postpartum period. However, there is limited evidence on the utilization of the recent eight ANC contacts.

Objective: To assess the utilization of eight ANC contacts and associated factors among postnatal women in Gurage zone, Central, Ethiopia.

Methods: A cross-sectional study was conducted at Gurage Zone Hospital from February 23 to May 22, 2024, using consecutive sampling technique. A pretested structured questionnaire was employed via face-to-face interview and collected data was entered into EpiData version 4.6. Data analysis was done using SPSS version 25. Binary logistic regression was applied to assess association between the dependent and independent variables with a p-value below 0.05 was used to define statistical significance. The analyzed data was presented in frequency, percentage, mean, tables and figures.

Results: A total of 392 pregnant women were included with response rate of 93%. The mean age of participants was 28 (SD $\pm$5). Overall, 147 (37.5 %; 95% CI:32.5 -42.5%) pregnant women had completed eight ANC contacts. Up on multivariable logistic regression model, age$\leq$20 years(Adjusted Odds Ratio (AOR) = 3.36; 95% CI: 1.42-7.92), residence (AOR = 2.02; 95% CI: 1.25-3.26), gestational age (AOR =3.35; 95% CI: 1.44-7.77), knowledge (AOR= 1.99; 95% CI: 1.08-3.67), perceived barriers (AOR=1.78; 95% CI: 1.01-3.14), cue to action (AOR= 2.37; 95% CI: 1.28-4.41), and ANC satisfaction(AOR=2.48; 95% CI:1.13-5.46) was statistically significant.

Conclusion: Eight ANC contact utilization is found to be low the national of reaching every pregnant woman and associated with age, residence, gestational age, knowledge of mother on 8 ANC contacts, perceived barriers, perceived cue to action, and ANC satisfaction. These findings help health care programmers and policymakers to introduce appropriate policies and programs to ensure increase the coverage of eight ANC contact.

Keywords Antenatal Care Eight Contact, Gurage Zone

1. INTRODUCTION

1.1 Background

Antenatal care (ANC) is defined as a routine care given to expectant mothers by qualified medical professionals between the time of conception and the start of labor in order to maintain optimal pregnancy conditions (1). The ANC plays a crucial role in promoting the health and well-being of both mothers and newborns by ensuring appropriate monitoring, preventive interventions, and early detection of potential complications(1,2) .

At least four goal-oriented, clinic-centered ANC visits also known as focused ANC were previously advised for all risk-free pregnant women by the World Health Organization (WHO) (2). However, it was replaced by a more expansive model that prioritizes contact number, timing, and services in the 2016 WHO guidelines for prenatal care ensure a healthy pregnancy experience. According to this model, there should be a minimum of eight ANC contacts. The first contact is recommended to be in the first trimester of pregnancy(before week 12), and the next two contacts should occur in the second trimester (at weeks 20 and 26) and five contacts should occur in the third trimester (at weeks 30, 34, 36, 38, and 40)(2,3).

The goal of the 2016 WHO ANC model recommendation is to improve outcomes for moms, fetuses, and newborns by optimizing the quality of ANC, because goal-oriented and reduced antenatal care packages were associated with a higher rate of fetal death between 32 and 36 weeks of gestation in the past (2,4). Hence, targeted frequent visit could help to achieve positive pregnancy experience and outcomes although achieving this could be challenged by various (1–3) . These visits provide an opportunity for health providers to deliver essential services such as tetanus vaccination, iron and folic acid supplementation, and prevention of mother-to-child transmission of human – immune deficiency virus (HIV) (3). One of the important indicators of maternal health that is reported globally is the coverage of ANC(5).

Perinatal and maternal mortality is strongly linked to having four or fewer ANC visits. (6–8). As a result, the WHO introduced a new model called "Minimum of Eight ANC Contacts," which aims to rethink and redesign services to meet specific contextual needs.

1.2 Statement of Problem

Globally, in 2020, an estimated 287,000 women die annually due to pregnancy-related complications, equivalent to almost 800 maternal deaths every day, and approximately one every two minutes ,with 95% of these deaths occurring in low-income nations(6,9–13). Many of these cases can be prevented and treated. Furthermore, perinatal mortality rates remain high worldwide (4,14). These could potentially be addressed by quality access to ANC for better care and survival (15).

In Sub-Saharan Africa (SSA), obstetric hemorrhage, hypertensive disorders in pregnancy, non-obstetric complications, and pregnancy-related infections are the primary causes of maternal death. (13,16). SSA also has a higher maternal mortality ratio (MMR) specifically, in Ethiopia (4). Additionally, Ethiopia faces a challenging maternal mortality issue, with an estimated MMR of 412 in 2016. Lack of ANC visits is associated with poor maternal health (6,17,18) .

The utilization of ANC is low across the globe .Hence, around 71% of pregnant women receive ANC Across the world (1,19). In 2021, multi-country nationally representative data revealed that the pooled prevalence of eight or more ANC contacts was 13.0%. Jordan exhibited the highest prevalence at 74.0%, followed by Ghana at 43.0% and Albania at 30.0%. In contrast, Senegal, Zambia, and Uganda reported very low prevalence rates of eight or more ANC contacts. (3). Factors at both the individual and community levels associated with having eight or more ANC in 2022 evidence from 36 SSA countries the total magnitude of eight or more ANC visits was 6.8% (20).

Besides, about 69% and 44% of pregnant women attended first and fourth ANC Visits respectively in SSA (13) . While, 27.3% pregnant women had at least four ANC visits received during pregnancy in rural Ethiopia (14,18,19,21) . According to global estimates from 2017, just three out of five women had at least four prenatal follow up. Merely 52% of women in areas with the greatest rates of maternal death, including SSA, had at least four ANC visits (22) .The prevalence of attending at least four or more ANC visits in 12 East African countries was 52.44% with the highest attending at least four or more ANC visits in Zimbabwe (75.72%)(23). and the lowest attending at least four or more ANC visits in Ethiopia (31.82%) in 2012- 2019 (23).In the Ethiopian

Demographic and Health Survey of women, 31.8% in 2016 (2,3,13) and 43.11% in 2019 (24) received four or more checkups.

The Sustainable Development Goal (SDG), a new global agenda that will take effect in 2030, important indicator is supported because maternal and perinatal morbidity and mortality are still rising. In particular, SDG target 3 seeks to lower the global rate of neonatal mortality to 12 per 1000 live births and the global rate of maternal mortality to less than 70 per 100,000 live births (1,2,5,23,25). Therefore, ANC is preferable to reduce those issues by completing the gap in the continuum of care through early detection, treatment, and prevention of issues related to pregnancy (1,2,26). Empirical data indicates that women without prenatal care have higher rates of perinatal mortality (5,15,17,25) .

Despite the importance of ANC, studies have shown that the utilization of ANC services, particularly the completion of the recommended eight contacts, remains suboptimal in many low- and middle-income countries(3,24,27). Inadequate utilization of ANC can lead to missed opportunities for early detection and management of pregnancy-related complications, which can have severe consequences for maternal and child health outcomes (3,25).

The goal of the 2016 WHO ANC model is to ensure that a women has a safe pregnancy and to improve maternal and child health outcomes by optimizing the quality of ANC (1,2). However, most studies identified that the factors of antenatal care such as women's and partner education level, husband's occupation , socioeconomic status , place of residence , age and religion ,income, , accessing media, , pregnancy status, number of children, distance ANC facilities were significantly associated with the lower utilization of antenatal care services (3,15,23,24).

In Ethiopia, many pregnant mothers seek care after experiencing complications during pregnancy or childbirth, often arriving at health facilities in critical conditions. The utilization of eight ANC visits varies in different countries, influenced by study settings and population characteristics and this could significantly reduce such late presentations (5,13). Thus, there is a need for context-specific evidence on the use of eight ANC visits and associated factors in diverse settings. This study aims to fill this gap by examining the utilization and factors related to eight ANC contacts among postnatal women in selected hospitals in the Gurage Zone. Understanding this is crucial for designing targeted interventions to improve ANC utilization and enhance maternal and child health

outcomes. Moreover, identifying associated factors of eight ANC utilization will enable lower-level decision makers and healthcare providers to develop evidence-based strategies for promoting and completing the recommended ANC visits. As far as in my search, I did not find any study about eight ANC contact in Ethiopia especially in the study context, Gurage Zone warranting the need to assess the utilization of eight ANC contacts among postnatal women and identify the associated factors that influence their utilization to support evidence-based interventions.

1.3 Significance of the Study

This study aimed to assess utilization of eight ANC contacts and factors associated among postnatal women in Gurage zone Hospitals. This study will contribute to maternal health and helps to improve ANC follow up, early detection and prevention of pregnancy related complication, then by informing health care professionals and decision makers on the relevant factors associated with Eight ANC. To increase knowledge of health provider about eight ANC contact and to give the necessary advice to pregnant mothers.

It will provide an input for policy makers, researchers, planners and health professionals to formulate policies and guidelines, strengthen the health system, and ultimately improve maternal and child health outcomes in the study area by filling existing knowledge gap on the 2016 WHO ANC model. By identifying associated factors of ANC utilization, it helps program planners to take action on poor implementation and healthcare providers to design targeted interventions to enhance ANC services, promote completion of eight ANC contacts, and reduce maternal and neonatal morbidity and mortality rates. Overall, this study will contribute to the existing literature and has implications for improving maternal and child health in Gurage Zone. In addition, the study will contribute for the implementation of target of Sustainable Development Goal (SDG) by indirectly contributing to improved maternal health and reduced maternal mortality via improved ANC service.

The existing literature on the utilization of eight antenatal care contacts and associated factors among postnatal women in Gurage Zone selected hospitals, Central Ethiopia, using the Health Belief Model reveals a significant gap in understanding the specific factors that influence women's utilization of ANC services in this context. While studies have explored the relationship between perceived susceptibility, perceived severity, perceived barriers, and cues to action with ANC

utilization, there is a lack of research focusing specifically on the utilization of eight ANC contacts and its associated factors among postnatal women in Gurage Zone. Additionally, the role of sociocultural factors, financial constraints, and community-based interventions in shaping ANC utilization remains underexplored. Therefore, further investigation is needed to fill this gap and provide insights that can inform targeted interventions to improve ANC utilization in the study area.

2. LITERATURE REVIEW

2.1 Utilization of Eight ANC Contacts

Antenatal Care is crucial for decreasing maternal morbidity and mortality through early detection and treatment of pregnancy-related complications (1). The WHO identifies antenatal care (ANC) as a highly effective strategy for enhancing maternal and child health. Its recommendations are designed to be adaptable and flexible, considering the unique contexts of each country and the specific needs of their populations. (5).

A cross-sectional study conducted in multi-country nationally representative data in 2021 showed that the pooled prevalence of eight or more antenatal care (ANC) contacts was 13.0%. Jordan had the highest prevalence at 74.0%, followed by Ghana at 43.0% and Albania at 30.0%. In contrast, Senegal, Uganda, and Zambia each reported a very low prevalence of 1% for eight or more ANC contacts. Additionally, there was notable heterogeneity in the prevalence of eight or more ANC contacts across the different countries. (3).

A study conducted in 2018 using a population based cross sectional study showed that in SSA nations, the total magnitude of eight or more ANC visits was 6.8% (20). Another study in Nigeria showed that the prevalence of eight or more ANC contacts was approximately 17.4% (24). Ghana in 2017 analysis of a cross-sectional survey determinants of attending antenatal care at least four times in rural area was reported 86% attending ANC at least four times, which was positively associated(28).

In addition to this ,EDHS in 2019 secondary data analysis was done 43.11% women were attending four and more antenatal care during current pregnancy (22,24).Similarly a study conducted in Ethiopia in 2021 only 35.5% of the pregnant mothers have used ANC services at least four times and 64.5% of the pregnant mothers have used less than three times during their periods of pregnancy (25).Furthermore in a cross-sectional study done in South Gondar Zone, Northwest Ethiopia in 2021 the magnitude of optimal ANC utilization was 59%(22).

In 2018 Nakuru cross sectional study showed that the majority of the women did not perceive they were susceptible to pregnancy related complications (85.5%), labor and delivery complications (78.64%), or having a bad pregnancy outcome (71.8%). Approximately 57 % perceived they were

susceptible to a difficult pregnancy (frequent headache, excessive vomiting excessive fatigue, mood swings among others) while 48 % of the women perceived they were susceptible to postpartum complications(29).

2.2 Factors Associated with Eight ANC Contact

2.2.1 Socio Demographic Factors

Different studies were identified a number of factors that are associated with the optimum utilization of ANC despite a limited study conducted on eight ANC. Numerous factors has been identified to be associated with ANC utilization. Hence, sex, residence, educational status and other sociodemographic factors could determine ANC attendance. For instance, age of the mother could determine the rate of ANC service utilization owning to many factors. Indonesia Demographic Health Survey(DHS) in 2017 reported that maternal age significantly affects ANC8 contacts (23.5% among 30-34 years compared to 3.5% among 15-49 years (30). Analysis of DHS datasets from 19 Low – and Middle Income Countries (LMICS) maternal age 25-34 years 18.03% good ANC8 contacts(24). Similarly , the 2019 Ethiopian Demographic Health Survey (EDHS), showed that ANC visit among mothers aged 25-29 years was 30.4% compared to only 2% among 45-49 years mothers (4). Similarly, a study conducted in 2016 EDHS depicted that women>30 years of age was significantly associated with better ANC service uptake (6).

Maternal educational status could be associated with eight plus ANC utilization. A cross section study done in Jordan in 2018 identified that educational status is associated with ANC where the utilization among primary education was 8.3% and secondary educational level was 51.7 (3,31). Another study based on the 2017 Bangladesh DHS report indicated that 38% of women with at least secondary education received antenatal care from health professional, compared with 18% of women with primary education. The study showed that better education can improve the ANC utilization among antenatal mothers (6,28,32).

Similarly, a study based on the 2019 Ghanaian malaria indicator health survey done on the prevalence and socioeconomic inequalities in eight or more ANC contacts depicted that educated women had significantly increased eight plus ANC utilization (40%) (33). Another cross-sectional study conducted from multi-country nationally representative data on the prevalence of eight or more antenatal care contacts concluded that women with at least secondary education were 2.46

times more likely to have eight or more ANC contacts as compared to women with no formal education (3). Furthermore, finding based on the recent 2019 EDHS report in Ethiopia showed that ANC attendance was higher among women with at least secondary education (72.5%)compared to those who are unable to read and write (32.4% indicating ANC utilization disparity by educational status(19).

The other important factor is disparity by residence in urban -rural disparity owning to access to health care services and socioeconomic disparities. For example, women living in rural areas were less likely to receive antenatal care according to reports from previous studies. The percentage of women who received ANC8 was 12.3% for rural and 25.26% for women from urban areas low and middle income countries setting based on the DHS datasets (34). In addition, another study conducted in 2018 using a population based cross sectional study design in SSA showed that using multilevel logistic regression analysis showed that residence, maternal education, husband's education, maternal occupation, and socioeconomic class were all positively associated with eight or more ANC visits (18). In Ethiopia, optimal ANC utilization was had significant association with maternal place of residence. In urban area, ANC utilization was (40.26%) and in rural area, it was (20.28%) (35).

Another study done in South Gondar showed that mothers with planned pregnancies were more likely to achieve four or more ANC4 visits compared to those with unplanned pregnancies .11.3% just follow, those with unwanted pregnancy 10.5%, a woman whose husbands work in the government or nongovernment sector 30.5%, those not being exposed to the media 48.4%, and rural women 44.5% were significantly associated with optimal ANC utilization (22). This has been reported from another study in SSA context as well (31).

Health care providers or other individuals may stigmatize or discriminate against unmarried mothers. To avoid awkward circumstances, they could decide not to receive prenatal treatment. Marital status is also linked to completing at least four ANC visits, according to a 2021 study that examined DHS data from East African nations. According to the study, compared to single mothers, married mothers were 11% more likely to complete at least four ANC visits. (23). Furthermore, a study done in Gondar city, Northwest Ethiopia, 2021 showed that married women are 85.5% more likely to receive antenatal care from a health professional than unmarried women (36), which could be associated with better socioeconomic status and husband support.

Additionally, regional disparities by geographic location have also been reported so far. Analysis the DHS in Ethiopia showed that completion of four or more ANC visits in Ethiopia showed a substantial regional variations where the use was low in Afar, Somali, and Amhara regional states (44-85% less likely to have ANC visits) and women from Addis Ababa city administration were 2.56 times likely to complete four or more ANC visits as compared to women in Tigray regional state (37).

Overall, Education and socioeconomic status have consistently emerged as important factors affecting ANC utilization. Women with higher educational levels and socioeconomic status are more likely to utilize optimal ANC services (30,38). Education empowers women with knowledge about the importance of ANC, while higher socioeconomic status provides better access to healthcare resources. Distance to healthcare facilities is another critical factor influencing ANC utilization.

2.2.2 Heath Facility Related Factors

Women with more mass media to exposure were more likely to have utilized ANC check-up than those who had less or no exposure, cross-sectional study designs from multi-country nationally representative data prevalence of eight or more antenatal care contacts findings women who use media were 2.37 times as likely to have eight or more ANC contacts, when compared with women who do not use media (3). On the contrary in EDHS 29.56% optimal ANC access with media exposure(34). A study conducted in Ethiopia in 2021 study showed that rich women, having access to mass media, and having pregnancy complications, married, rural women significantly associated with the ANC service uptake (6). Similar study has also reported that media exposure was positively associated with eight or more ANC visits (18).

A cross sectional community based study conducted in the eastern zone of rural Tigray, Northern Ethiopia in 2019 showed that mothers who walked less than one hour to reach the nearest health facility were 3.9 times more likely to complete four antenatal care (ANC) visits compared to those who walked for more than one hour (39). Similarly, in 2016 EDHS in a community-based survey study conducted in 2021, Among individual level factors autonomy to make decision to their care were positively associated with ANC follow up (6).

Hence, distance to healthcare facilities is another critical factor influencing ANC utilization. Women residing in remote areas or facing transportation challenges are less likely to access timely and comprehensive ANC services (4,40). These challenges hinder their ability to receive adequate prenatal care and contribute to suboptimal ANC utilization.

1.2.3 Reproductive and obstetric related factors

Several reproductive and obstetric-related factors have been identified as key determinants of ANC utilization. The 2017 Bangladesh DHS report showed that mothers with parity <2 were more likely to complete four ANC visits than mothers with >4 parity (28%), (5.6 %)(32).A study showed that in SSA correlates of antenatal care utilization among women of reproductive age are evidenced by a multinomial analysis of demographic and health surveys conducted from 2010 to 2018 across 31 countries. The findings indicate that women with one previous birth are more likely to utilize antenatal care appropriately compared to women with five or more previous births.(6,14). Another study conducted in SSA in 2022 using a population-based, cross-sectional ANC utilization among women with a birth order of two to four, the decline was 15%. In contrast, women with a birth order of five or higher experienced a 24% decline compared to those with a first birth order. (6,15,41).

Studies have shown that maternal age plays a significant role, with younger or adolescent mothers having lower parity being less likely to access optimal Antenatal care services compared to older mothers. Factors such as limited knowledge, lack of decision-making autonomy, and societal barriers contribute to this disparity. Additionally, parity has been found to influence ANC utilization, with multiparous women demonstrating higher utilization rates compared to nulliparous women(3,5). Experiences previous pregnancy and awareness of the benefits of ANC may contribute to the increased utilization among multiparous women.

2.2.4. Health Belief Model Domains Affecting ANC Utilization

2.2.4.1 Perceived susceptibility to adverse pregnancy outcomes:

In the Ethiopian context, several studies have examined the relationship between perceived susceptibility to adverse pregnancy outcomes and antenatal care (ANC) utilization. In 2019 cross sectional survey show that women who perceived themselves as more susceptible to pregnancy

complications were significantly more likely to utilize Antenatal care services (42). This perception was influenced by factors such as previous adverse pregnancy outcomes, personal experiences, and exposure to health education campaigns.

Additionally, an institutional-based cross-sectional study show that in 2021 highlighted the role of community-based health education interventions in shaping perceived susceptibility. The authors found that women who received information about the potential risks of adverse pregnancy outcomes during community health discussions had higher perceived susceptibility and were more motivated to seek ANC (43). These findings suggest that tailored health education programs emphasizing the potential risks and consequences of pregnancy complications can positively influence perceived susceptibility and ANC utilization

2.2.4.2 Perceived severity of pregnancy complications:

Perceived severity of pregnancy complications has been identified as a crucial factor influencing ANC utilization in Ethiopia. A cross-sectional study shows that in 2018 demonstrated that women who perceived pregnancy complications as severe were more likely to seek ANC services. This perception was influenced by factors such as personal experiences, community discussions, and exposure to health campaigns emphasizing the severity of complications and the benefits of early detection and management through ANC (43).

Furthermore, a study in 2021 emphasized the influence of social networks on perceived severity. Women who received advice or recommendations from friends, family members, or community health workers reported higher perceived severity and were more motivated to utilize ANC services (44). These findings suggest the importance of community-based interventions that leverage social networks and promote peer support to enhance perceived severity and ANC utilization.

2.2.4.3 Perceived barriers for not using antenatal care:

Understanding the perceived barriers for not using ANC is crucial for improving utilization rates in Ethiopia. Another study identified various barriers reported by women, including financial constraints, lack of awareness about ANC services, and distance to healthcare facilities (45). Financial constraints were found to be a significant barrier, with women unable to afford

transportation costs, or associated expenses. Increasing financial accessibility through targeted interventions, such as fee waivers or health insurance schemes, can help overcome this barrier (40).

Additionally, a qualitative study highlighted the influence of sociocultural factors on perceived barriers. Factors such as societal norms, lack of support from family or community, and fear of stigma were reported as barriers to ANC utilization (46). Addressing these sociocultural barriers requires community engagement programs that address cultural beliefs, involve influential community members, and promote social support networks to create an enabling environment for ANC utilization.

2.2.4.4 Cue to action to utilize antenatal care

The presence of cues to action plays a vital role in motivating women to utilize Antenatal care services. A study done in Ethiopia emphasized the influence of healthcare providers as cues to action. Women who received recommendations or encouragement from healthcare providers were more likely to seek ANC as compared to their counterpart (47). The study also highlighted that the importance of provider-patient communication and the need for healthcare providers to actively promote ANC utilization through personalized counseling and advice. Moreover, another study by in Ethiopia explored the role of mass media as cues to action (38). Women who were exposed to health messages through radio, television, or community campaigns were more motivated to utilize Antenatal care services. These findings suggest the importance of leveraging mass media channels to disseminate information about ANC and create cues to action for women in Ethiopia.

The existing literature on the utilization of eight antenatal care contacts and associated factors among postnatal women in west Gurage Zone selected hospitals, Central Ethiopia, using the Health Belief Model reveals a significant gap in understanding the specific factors that influence women's utilization of ANC services in this context. While studies have explored the relationship between perceived susceptibility, perceived severity, perceived barriers, and cues to action with ANC utilization, there is a lack of research focusing specifically on the utilization of eight ANC contacts and its associated factors among postnatal women in Gurage Zone. Additionally, the role of sociocultural factors, financial constraints, and community-based interventions in shaping ANC utilization remains underexplored. Therefore, further investigation is needed to fill this gap and

provide insights that can inform targeted interventions to improve ANC utilization in the study area.

2.3 Conceptual Framework

The conceptual framework has been adapted from health belief model by reviewing different literatures. Health belief model posits that individual health behaviors are influenced by several key constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action. In the context of ANC follow-ups, these constructs can help understand why some pregnant individuals may adhere to the recommended number of visits while others may not.

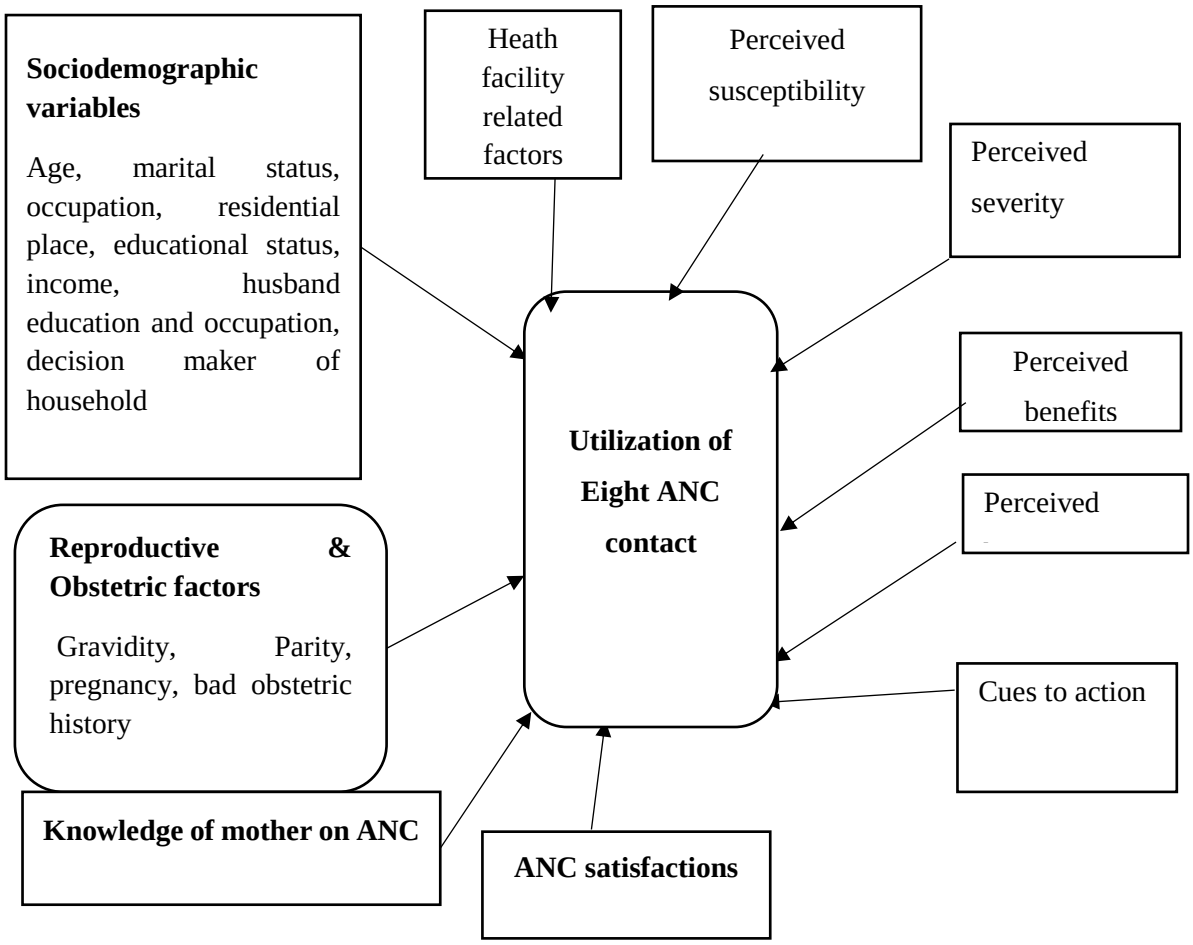

Figure 1 Conceptual framework health belief model for a study on utilization of eight ANC contacts and factors associated among postnatal women in Gurage zone hospital central Ethiopia (3,22,25,29,33,35,48–53).

3. OBJECTIVES OF THE STUDY

3.1 General Objective

- To assess utilization of eight ANC contacts and its associated factors among postnatal women in Gurage zone hospitals, Central Ethiopia 2024

3.2 Specific Objectives

- To determine utilization of eight ANC contacts among postnatal women in Gurage zone hospitals, Central Ethiopia 2024
- To identify factors associated factors with eight ANC contacts in Gurage zone hospitals, Central Ethiopia 2024

Research questions

- What is the level of utilization of eight ANC contacts among postnatal mothers in Gurage zone hospitals?
- What are the potential factors associated with the utilization of eight ANC contacts?

4. MATERIALS AND METHODS

4.1 Study Area and Period

The study was conducted in Gurage Zone from 23 February 2024 to 22 May 2024. Wolkite town is the administrative center of Gurage zone in the Central Ethiopia Region. It is located 155Kms south west to Addis Ababa. Gurage Zones shares boundaries with Hadiya and Yem special zones on the South East, Silte zone on the South-West and South, Oromia region on the North, West, East and South West. The total surface area of the region is about 5,932 km^2. Gurage Zone is the country with an estimated total population of 1,910,386, males 926,609 and female 983,777 in 2024(54).

The study took place in the Obstetrics and Gynecology ward at Gurage Zone Hospitals. Wolkite University Specialized Hospital (WKUSH) serves as a teaching hospital with four primary clinical departments: internal medicine, surgery, pediatrics, and gynecology/obstetrics. Additionally, it offers a range of other clinical services, including dentistry, ophthalmology, psychiatry, anesthesia, ICU, NICU, and dermatology. The first stage, second stage and postnatal room of the Labor ward has eight, five and seven beds respectively. The Labor ward, maternity ward and Gyn wads are run by midwifes, nurses, medical interns, residents, general practitioners and obstetrics and gynecology specialist doctors. The hospital services as a referral hospital for the nearby health centers and hospitals. Its catchment's population is about four million.

This study was also conducted at Attat primary hospital which is found 175 km southwest of Addis Ababa and the Hospital was established in 1961 E.C. Its catchment's population is 800,000 mainly centered for Cheha Woreda of Gurage Zone. The third hospital included in the study is Gunchire primary hospital in Enemore and Ener woreda of Gurage zone. It is 172 km of far away from Addis Ababa and 42 km from wolkite town.

4.2 Study Design

Institution based cross-sectional study design was used.

4.3 Populations

4.3.1 Source of Population

All postnatal women who were admitted to postnatal rooms at hospitals in Gurage Zone, central Ethiopia.

4.3.2 Study Population

Postnatal women who were attending postnatal care in those selected hospitals in Gurage Zone during the study period.

4.4 Eligibility Criteria

4.4.1. Inclusion Criteria

All postnatal women who were admitted to postnatal rooms at the three selected hospitals during the study period were included.

4.4.2. Exclusion Criteria

Postnatal women who were critically & mentally ill during the study period and women with incomplete ANC records (ANC chart and referral paper) where ascertainment of the outcome variable is difficult was excluded from the study. In addition, mothers with premature delivery (gestational age less than 37 weeks) were excluded as the time for the full ANC could be difficult to confirm.

4.5 Determination of Sample Size

The sample size was calculated using a formula for estimating a single population proportion based on the following assumptions:

Z= z-score for 95% confidence level (1.96)

P= estimated population proportion (50%) as evidence from previous study in Ethiopia on the eight plus ANC is not available.

D= margin of error (5%)

$$n = \frac{(z/2)^2 p(1-p)}{d^2}$$

n = 384

Adding 10% non -respondent 38, total sample size **422**

Where **n**= sample size

The sample size for the second objective was calculated using EpiInfo software. the Odds ratio and percent of unexposed with outcome from previous studies as follows. A 95% confidence level, 80% power, 5% significance level was assumed.

Table 1 Sample size calculation for factors associated with eight ANC visit in central Ethiopia

Factors considered	Assumptions	Sample size	Reference
Planned pregnancy	Adjusted Odds Ratio = 1.91 % of unexposed with outcome = 44.6% Power = 80% Confidence level =95%	330	(22)
Husband supporting during ANC	Adjusted Odds Ratio = 2.56 % of unexposed with outcome = 28% Power = 80% Confidence level =95%	172	(25)
Distance to health facility	Adjusted Odds Ratio = 3.94 % of unexposed with outcome =69.5 % Power = 80% Confidence level =95%	138	(25)
Health provider behavior	Adjusted Odds Ratio = 0.374 % of unexposed with outcome = 35.7% Power = 80% Confidence level =95%	198	(22)

Comparing the calculated sample sizes for the study, first and second objectives, the sample size for objective one was greater than objective two, (138<172<198 and 330 <384) then final sample size of 422 was considered for the current study.

4.6 Sampling Technique and Procedure

At first search Gurage zone hospitals then three hospitals were selected using simple random sampling (WKUSH, Attat and Gunchire Hospitals). The calculated sample was proportionally allocated to the three hospitals based on their total case load. The total postnatal admission in the last year's three consecutive months February, March and April report at Attat primary hospital were 175,180,170 respectively (total of 525) and at WKUSH (154, 162, 127; with a total of 443) and at Gunchire hospital 77, 81, 82 giving a total of 240. Then sample size multiplied by total report each hospital divided by total three hospital caseload and a total of 525, 443 and 240 was selected from WKUSH, Attat, and Gunchire hospitals, respectively. Then, the participants were selected through consecutive sampling where every mother who visit the ANC during the study period were included in the study until the final sample is achieved. Hence, to select mothers from each hospital a consecutive sampling method was employed.

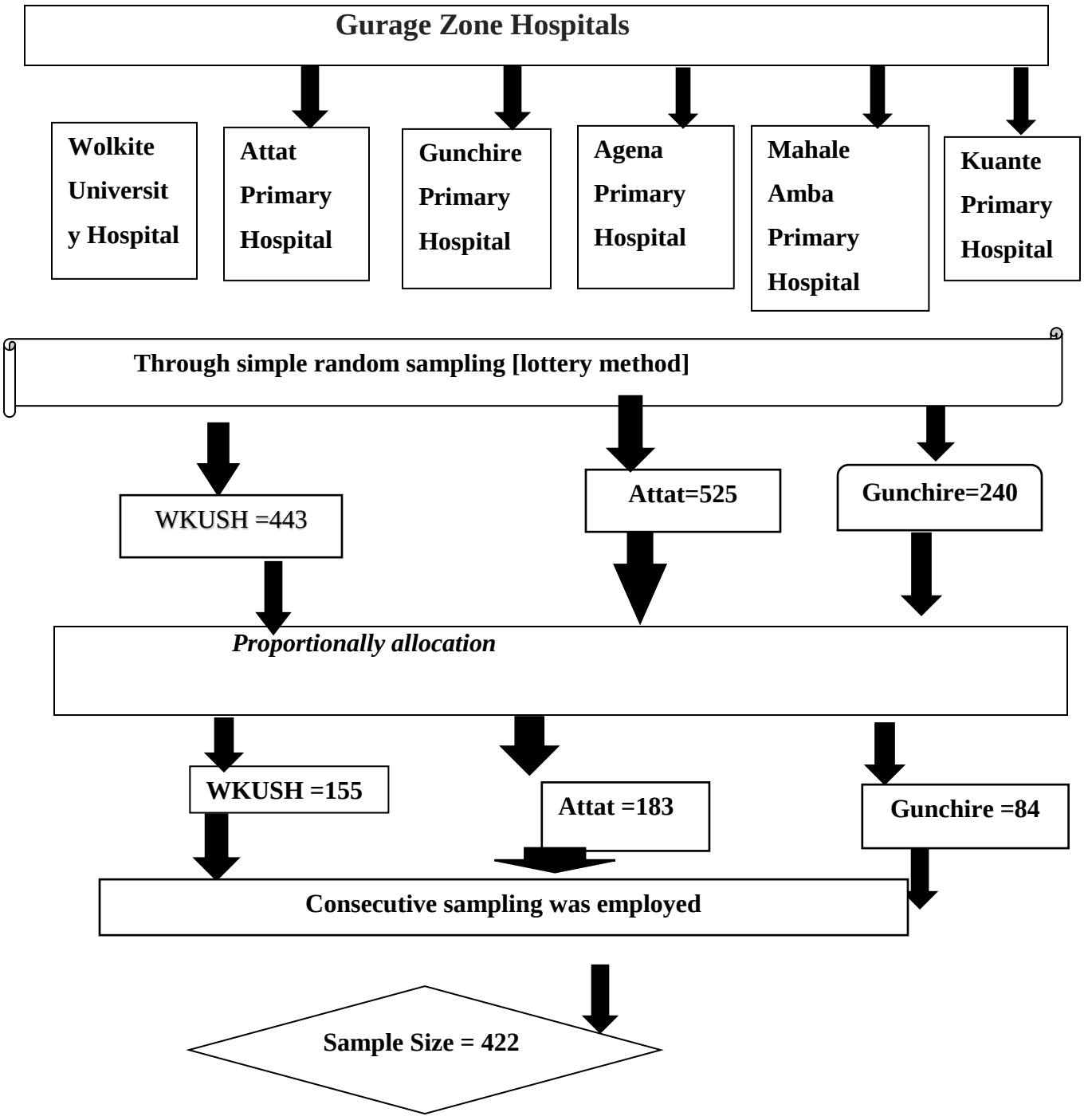

Figure 2 Schematic representation of sampling procedure in selected hospitals of Gurage zone central Ethiopia.

4.7. Variables of Study

4.7.1. Dependent Variable

Eight ANC contacts (ANC8)

4.7.2. Independent Variables

Socio-demographic: - age, marital status, educational status, occupation, income, residence, husband's education and occupation, decision maker of the household

Reproductive and obstetric factors: gravidity, parity, bad obstetric history

Heath facility related factors: transportation, distance from health institution, access to transport

Knowledge of mother on ANC

ANC satisfactions

Perceived susceptibility

Perceived severity

Perceived barriers

Perceived benefits

Cue to actions

4.8 Data Collection Methods

4.8.1. Data Collection Instrument

Data were collected using a pretested and structured interviewer administered questioner adopted from previously published articles(3,4,22,23,25,29,35,49–51,55,56). The questioner contains socio-demographic questions, obstetric factor, Heath facility related factors, ANC utilization related question and perceived susceptibility and perceived severity. The questionnaire was prepared in English and translated to the local languages (Amharic and Guragena languages) and then translated back to English to check its consistency. Hence, the questionnaire was administered in Amharic language and Guragena language.

Data were collected from postnatal women through interviewer administered face-to-face interview using structured questionnaire. The outcome variable was collected from the client's chart to find out if she has done ANC contacts and to confirm the number of ANC contact and the date, she had the visits as well. Six data collectors (Midwives) and three supervisors were recruited to collect the data of the study.

4.9. Data Quality Assurances

To assure the quality of the data 1 day training on how to collect the data and confirm the outcome from the client chart and ways of interview was given to the data collectors by the principal investigator. The study's goals, the questionnaire's contents, concerns about response confidentiality, and respondents' rights were the main topics of the training. The questionnaire was pre-tested in other similar health institution in Agena primary hospital which is study area on 5% of the sample size and necessary amendments was made before actual data collection. Pretest was done 21 postnatal women in Agena primary hospital. To ensure the reliability and feasibility of the data collection tool, we employed a pretesting of the study tool and the setting and necessary amendments were made. A daily supportive supervision and feedback were given by the investigator. The investigator made cross check on 10% of the collected data selected randomly. The supervisors checked the data for completeness and consistency on a daily basis. Good interaction between respondents and data collectors were maintained.

4.10. Operational Definitions

- **Optimal ANC** is number of ANC contact needs to be used throughout pregnancy to reduce pregnancy complication and maternal mortality (4). Hence, based on the recent WHO recommendation a pregnant mother should have at least 8 ANC attendances during the pregnancy periods.
- **ANC8**-is defined as having at least eight ANC during her recent pregnancy as indicated in the maternal ANC follow-up record. A mother with ANC visits below eight during the period of pregnancy is defined as having inadequate (less than 8 ANC follow-up) as per the recent WHO eight plus ANC model (2,3).
- **Perceived Susceptibility**: The perceived susceptibility assessment involved five items using a 5-point Likert scale (1 =strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree); the maximum value was 25 and the minimum value was 5, the computed result was categorized into high perceived susceptibility to health risks during pregnancy and low perceived susceptibility to health risks during pregnancy(57).
    - **High perceived susceptibility**: a score greater than mean from questions asked to assess perceived susceptibility to health risks during pregnancy

- **Low perceived susceptibility**: -Score less than mean from questions asked for an assessment of perceived susceptibility to health risks during pregnancy.

- **Perceived Severity**: The perceived Severity assessment involved seven items using a 5-point Likert scale (1 =strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5= strongly agree); the maximum value was 35 and the minimum value was 7, the computed result was categorized into high perceived severity to pregnancy and low perceived severity pregnancy(50).
    - **High perceived Severity**: a score greater than mean from questions asked to assess perceived susceptibility to complications during pregnancy
    - **Low perceive Severity** -Score less than mean from questions asked for an assessment of perceived severity to complications during pregnancy (48).
- **Perceived Benefits**: The perceived benefits assessment involved four items using a 5-point Likert scale (1 =strongly disagree, 2= disagree, 3 = neutral, 4= agree, 5 = strongly agree); then the maximum value was 20 and the minimum value was 4, the computed result was categorized into high perceived benefits to the belief that ANC follow-ups offer tangible advantages to the pregnant individual and their baby (51).
    - **High perceived benefits:** - a score greater than mean from questions asked to assess perceived benefits of ANC follow-ups to offer tangible advantages to the pregnant individual and their baby.
    - **Low perceive benefits**: -Score less than mean from questions asked for the assessment of perceived benefits to the belief that ANC follow-ups offer tangible advantages to the pregnant individual and their baby (48).
- **Perceived Barriers**: The perceived barriers assessment involved four items using a 5-point Likert scale (strongly disagree =1, disagree =2, neutral =3, agree =4, strongly agree =5); then the maximum value was 20 and the minimum value was 4, the computed result was categorized into high perceived barriers to the perceived obstacles or challenges that pregnant individuals may face in accessing and attending ANC follow-ups (15,34,48,58).
    - **High perceived Barriers**: - a score less than mean from questions asked to assess perceived barriers to the belief that ANC follow-ups offer tangible advantages to the pregnant individual and their baby.

- **Low perceived Barriers**: Score greater than mean from questions asked for an assessment of perceived barriers to the belief that ANC follow-ups offer tangible advantages to the pregnant individual and their baby.

- **Knowledge**: The knowledge assessment involved 20 items using a 5-point Likert scale (strongly disagree=1 , disagree =2, neutral =3, agree =4, strongly agree =5); then the maximum value was 100 and the minimum value was 20, then the computed result was categorized into good knowledge and poor knowledge.
    - **Good Knowledge**: postnatal mothers who responded above mean score to knowledge-based questions.
    - **Poor knowledge**: pregnant mothers who responded less than mean score correct answer to the knowledge-based questions.

4.11 Data Processing and Analysis

The collected data were checked for completeness and consistency. The data were coded and entered into the EpiData version 4.6 and exported to a statistical program for social science (SPSS) version 25 for further analysis. The data were summarized using mean, median, standard deviations and interquartile range when appropriate. The normality of continues variables were checked using Kolmogorov Smirnov test. Furthermore, data were presented via frequency tables, charts and graphs. Bivariable and multivariable binary logistic regression model were used to identify the association between the explanatory (independent) variables and ANC8 (the dependent variables). A p-value <0.25 in bivariable analysis was used as a criteria for including a variable in the multivariable analysis. The model fitness was checked using Hosmer and Lemeshow goodness of fit ($p > 0.05$). The model fitness was Hosmer and Lemeshow goodness of fit (.717). Multicollinearity were checked using inflated standard error or high correlation coefficient between independent variables. Multicollinearity were checked using(age , address, marital status ,parity ,gravidity ,transport cost),age variance inflation factor (VIF)1.331,tolerance =.751), address (VIF = 1.197, tolerance 0.837), marital status (VIF = 1.047, tolerance 0.955) reliability analysis for scale (knowledge of pregnant mother Cronbach's Alpha result .953, perceived susceptibility = 0.885, perceived severity =.904,perceived benefits =.880, perceived barriers = 0.871, perceived cue to action = 0.775). Multicollinear variables were omitted from the model. Variables with p-value of below 0.05 at multivariable analysis were considered as statistically significant factors associated with ANC8. Both crude and Adjusted Odd Ratio (COR and AOR) with 95% CI

(confidence interval) were reported along with the p-values to measure the strength of association between explanatory variables and ANC8.

4.12 Ethical Considerations

Before data collection, the ethical approval and clearance for the study was obtained from institutional review board of Wolkite University College of medicine and health sciences. A formal support letter written from research and community service coordinator of the college of medicine and health sciences were submitted to each respective hospitals. Verbal consent was also obtained from the study participants after the purpose of the study was explained. To ensure privacy and confidentiality the interview was conducted where questions and answers cannot be overheard. They are also informed that the information obtained from them will not be disclosed to any third person /body. In order to maintain complete confidentiality other identifying information including name were not recorded on the questionnaire.

4.13 Dissemination of the Findings

The final results of this study will be presented to Wolkite University College of medicine and health sciences department of Nursing, Wolkite University specialized hospital Gunchire primary hospital, and Attat primary hospital finally, the study findings will be published in reputable journals.

5.RESULT

5.1 Sociodemographic Factors

A total of 392 women agreed to participate in this study with a response rate of 93%. The mean age of the participants was 28 (SD ±5). A high proportion (47.2%) of the respondents were in the age group of 21-29 years, and more than half (55.1%) were urban residents. Two hundred thirty-seven (60.5%) of the respondents were Gurage in ethnicity and 41.3% -were Muslim in religion. Vast majority of the respondents (89%) were married. Only less than a quarter (22.4%) of the respondents had attained a college-level education or higher. According to the partner educational level of the respondents, majority of them were greater than 12 grades 140 (35.7%). About 25% of them were housewives. According to the monthly income of the respondents, majority of them had 1000-4999 birr 166 (42.3%) (Table 2).

Table 2. Sociodemographic characteristics on utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage zone hospitals, central Ethiopia, 2024 (n = 392).

Variables	Categories	Frequency	Percentage
Age in years	<20	42	10.7
	21-29	185	47.2
	>30	165	42.1
Address/residence	Urban	216	55.1
	Rural	176	44.9
Ethnicity	Gurage	237	60.5
	Amhara	41	10.5
	Oromo	53	13.3
	Other *	61	15.6
Religion	Muslim	162	41.3
	Orthodox	139	35.5
	Catholic	60	15.3
	Protestant	31	7.9
Marital status	Married	349	89.0
	Single	43	11.0
Educational status	Write and read to	68	17.3
	unable	99	25.3
	Can write and read	41	10.5
	School of primary	96	24.5
	Grade 9-12	88	22.4
	College and above		

partner educational level	Write and read to	60	15.3
	unable	43	11.0
	Can write and read	73	18.6
	School of primary	76	19.4
	Grade 9-12	140	35.7
	College and above		
Occupation	Government	86	21.9
	House wife	98	25
	Merchant	91	23.2
	Daily laborer	21	5.4
	Farmer	76	19.4
	Student	20	5.1
Husband main occupation	Private employee	63	16.1
	Government employee	81	20.7
	Merchant	113	28.8
	Farmer	108	27.6
	Daily laborer	27	6.9
Incomein ETB	<500	128	32.7
	501-1500	49	12.5
	1501-2500	35	8.9
	>2501	180	45.9
Decision maker in your house	You	18	4.6
	Your husband	359	91.6
	Both equality	15	3.8

Notes: Other specify ethnicity, zone and woreda refer to Tigray, Wolaita, Kebena, and Abeshigae.

5.2 Knowledge of Mothers about ANC

Women's responses to the knowledge regarding ANC show that, do pregnant women need to go for antenatal check-up respondents had agreed 194(49.5%) and does pregnant woman need vitamin supplement had agreed 206(52.6%) and pregnant mothers had ultrasound scan safe for the fetus are strongly agreed 206(52.6%) (Table 3)

Table 3. Mothers knowledge regarding with ANC among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do pregnant women need to go for antenatal check-up?	28(7.1%)	40(10.2%)	13(3.3%)	194(49.5%)	117(29.8%)
Should first antenatal check-up be done in the first 3 months?	15(3.8%)	42(10.7%)	39(9.9%)	201(51.3%)	95(24.2%)

Does pregnant woman need vitamin supplement?	24(6.1%)	22(5.6%)	43(11%)	206(52.6)	97(24.7%)
Does maternal smoking harmful to the fetus?	63(16.1)	40(10.2%)	26(6.6%)	128(32.2%)	135(34.4%)
Should you take alcohol to provide extra energy during pregnancy?	247(63%)	69(17.6%)	31(7.9%)	29(7.4%)	16(4.1%)
Does pregnant woman need to come for at least five antenatal follow up throughout her pregnancy?	35(8.9%)	48(12.2%)	47(12%)	205(52.2%)	57(14.5%)
Can a pregnant woman go to the clinic for antenatal follow-up?	39(9.9%)	61(15.6%)	87(22.2%)	133(33.9%)	72(18.4%)
Should a pregnant woman see the doctor for antenatal care only if she has pregnancy complication?					
Blood screening for hepatitis b infection	25(6.4%)	29(7.4%)	31(7.9%)	117(29.8%)	190(48.5%)
Blood screening for HIV infection	24(6.1%)	33(8.4%)	33(8.4%)	114(29.1%)	188(48%)
Blood screening for hemoglobin level	20(5.1%)	31(7.9%)	43(11%)	114(29.1%)	184(46.9%)
Blood pressure examination	24(6.1%)	28(7.1%0	51(13%)	120(30.6%)	169(43.1%)
Blood sugar level	30(7.7%)	31(7.9%)	45(11.5%)	108(27.6)	178(45.4%)
Urine test for bacterial infection	21(5.4%)	21(8.4%)	53(13.3%)	109(27.8%)	177(45.2%)
Can high blood pressure affect the fetus growth?	29(7.4%)	32(8.2%)	87(22.2%)	92(23.5%)	152(38.8%)
Do diabetic women have higher risk of having big babies?	31(7.9%)	28(7.1%)	97(24.7%)	87(22.2%)	149(38%)
Is ultrasound scan safe for the fetus?	21(5.4%)	27(6.9%)	37(9.4%)	101(25.8%)	206(52.6%)
Is antenatal class good to prepare expecting mothers mentally?	28(7.1%)	30(7.7%)	74(18.9%)	125(31.9%)	135(34.4%)
Can emotional disturbance affect fetal growth?	34(8.7%)	41(10.5%)	68(17.3%)	125(31.9%)	124(31.6%)
Should women deliver in the hospital for their first pregnancy?	48(12.5%)	48(12.5%)	52(13.3%)	108(27.6%)	136(34.5%)

A total of twenty questions related to antenatal care (ANC) were asked, with one point assigned for each correct answer and zero for each incorrect answer. After compute variables of mean score were recoding and categorized good knowledge and poor knowledge. Based on this classification, 286 mothers (73%) were categorized as having good knowledge of ANC, while 106 mothers (27%) were categorized as having poor knowledge (Table 4).

Table 4. Knowledge of mothers regarding ANC among postnatal women in Gurage zone hospitals, central Ethiopia, 2024

Variables	Frequency	Percent
Poor knowledge of pregnant mother with ANC follow-up	106	27.0
Good knowledge of pregnant mother with ANC follow-up	286	73.0

5.3 Obstetric and Reproductive Health Related Factors

Regarding gravidity, 152(38.8%) were pregnant 2-4 times and more than one-third (34.7%) of them had experienced pregnancy related complications during their current pregnancy. Forty - eight (12.2%) and 28 (7.1%) mothers had abortion and preeclampsia history, respectively. One third (33.9) of the mothers had delivered by caesarean section and 75(19.1%) had a history of multiple pregnancy (Table 5).

Table 5. Reproductive health and obstetric related characteristics of postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Variables	Categories	Frequency	Percentage
Gravidity	Primigravida	127	32.4
	2-4	152	38.8
	>4	113	28.8
Parity	Primigravida	154	39.3
	2-4	144	36.7
	>4	94	24
Gestational age at delivery in weeks	<40	356	90.8
	>40	36	9.2
Pregnancy complications	yes	136	34.7
	No	256	65.3
Pregnancy complications	APH	23	5.9
	Abortion	48	12.2
	Preeclampsia	28	7.1
	Still birth	10	2.6
	Preterm birth	2	.5
	Other specify	2	.5
delivered by caesarean section	yes	133	33.9
	No	259	66.1

multiple pregnancy	Yes	75	19.1
	No	317	80.9

- (car accident and hyperemesis)

5.4. Health Belief Constructs of ANC Utilization

Perceived susceptibility

Health belief model on utilization of eight antenatal care contacts, perceived susceptibility. It is extremely I will get pregnancy-related complications was agreed 172(43.9%), I fear I will have a difficult pregnancy period agreed175(44.6%) and I am more likely than the average woman to get bad pregnancy outcome was strongly agreed 33(8.4%) (Table 6).

Table 6 Perceived susceptibility on utilization of eight Antenatal care contacts and associated factors among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Health belief constructs	Variables	Strongly disagree	Disagree	Disagree	Agree	Strongly agree	Mean (SD)
Perceived susceptibility	It is extremely I will get pregnancy-related complication	33(8.4%	109(27.7%)	39(9.9%)	172(43.9%)	39(9.9)	3.19(1.191)
	I fear I will have a difficult pregnancy period	34(7.543%)	89(22.7%)	58(14.8%)	175(44.6%)	36(9.2%)	3.23(1.157)
	There is a good possibility I will get complications related to delivery	35(8.9%)	81(20.7%)	73(18.6%)	173(44.1%)	30(7.7%)	3.21(1.127)
	My chances of getting pregnancy-related complications are great	38(8.3%)	111(16.1%)	63(9.7%)	134(34.2%)	46(11.7%	3.10(1.125)
	I am more likely than the average woman to get bad pregnancy outcome	80(20.4%)	80(25.3%)	65(16.6%)	115(29.3%)	33(8.4%)	2.80(1.290)

perceived severity

The women's responses regarding health belief model on utilization of eight antenatal care contacts perceived severity, Problems I would experience with pregnancy and delivery would last a long time was disagreed 120(30.6%) and I fear my baby will be born prematurely was agreed 136(34.7%) (Table 7).

Table 7. Perceived severity on utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Health belief constructs	Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (SD)
Perceived severity	Problems I would experience with pregnancy and delivery would last a long time.	29(7.4%)	120(30.6%)	51(13%)	115(29.3%)	77(19.3%)	3.23(1.277)
	Pregnancy complications would threaten the relationship with my partner	49(12.5%)	107(27.3%)	52(13.3%)	104(26.5%)	80(20.4%)	3.15(1.355)
	Pregnancy-related complications can lead to permanent changes in life.	39(9.9%)	105(26.3%)	41(10.5%)	123(31.4%)	84(21.4%)	3.28(1.329)
	My pregnancy would not last to term	45(11.5%)	74(18.9%)	87(22.2%)	132(33.7%)	54(13.8%)	3.19(1.226)
	I am scared my baby would not survive the pressure that comes with labor	49(12.5%)	70(17.9%)	63(16.1%)	149(38%)	61(15.6%)	3.26(1.271)
	If I got pregnancy-related complications, I fear I won't survive it.	50(12.8%)	81(20.7%)	75(19.1%)	113(28.8%)	73(18.6%)	3.20(1.309)
	I fear my baby will be born prematurely	43(11%)	84(21.4%)	71(18.1%)	136(34.7%)	58(14.8%)	3.21(1.246)

Perceived benefits

Perceived benefits, If I got proper ANC, my risk of complicated pregnancy would decrease agreed191(48.7%) and through proper ANC, I am able to get proper diagnosis and treatment 197(50.3%) (Table 8).

Table 8. Perceived benefits on utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Health belief construct	Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (SD)
Perceived benefits	If I got proper ANC, my risk of complicated pregnancy would decrease.	20(5.1%)	27(6.9%)	19(4.8%)	191(48.7%)	135(34.4%)	4.01(1.063)
	Through proper ANC, I am able to get proper diagnosis and treatment	16(4.1%)	18(4.6%)	23(5.9%)	183(46.7%)	152(8.8%)	4.11(.993)
	Properly attending ANC could help me get health.	16(4.1%)	21(5.4%)	20(5.1%)	197(50.3%)	138(35.2%)	4.07(.991)
	Through timely ANC, I can get timely healthy counseling	18(4.6%)	30(7.7%)	18(4.6%)	180(45.9%)	146(37.2%)	4.04(1.067)

Perceived barriers

Perceived barriers my husband or family usually do not support me to get timely ANC was strongly disagree148(37.8%) and due to discomfort and other issues while pregnancy makes me not go for ANC was strongly disagree 24(6.1%) (Table 9).

Table 9. Perceived barriers on utilization of eight antenatal care contacts and associated factors among postnatal women in Gurage zone hospitals, central Ethiopia, 2024

Health belief construct	Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (SD)
Perceived barriers	My husband or family usually do not support me to get timely ANC	148(37.8%)	133(33.9%)	27(6.9%)	64(16.3%)	20(5.1%)	2.17(1.238)
	The costs associated with ANC usually makes me not to attend ANC.	151(38.5%)	130(33.2%)	27(6.9%)	56(14.3%)	28(7.1%)	2.18(1.280)
	I personally do not believe that ANC is beneficial and hence, I may prefer not to go for ANC	144(36.7%)	137(34.9%)	41(10.5%)	48(12.2%)	22(5.6%)	2.15(1.203)
	The quality of ANC service at health facility is not conducive for me	122(31.1%)	153(39%)	40(10.2%)	61(15.6%)	16(4.1%)	2.22(1.165)
	My work condition does not allow me to have timely ANC.	117(29.8)	145(37%)	40(10.2%)	77(19.6%)	13(3.3%)	2.30(1.184)
	Due to discomfort and other issues while pregnancy makes me not go for ANC	88(22.4%)	115(29.3%)	35(8.9%)	130(33.2%)	24(6.1%)	2.71(1.300)

Perceived cue to action

Perceived cue to action, do you believe that the message of the media (e.g. television, radio, internet) was agreed 181(46.2%) and it is important to have a reminder or warning from health professionals was agreed 218(55.6%) (Table 10).

Table 10. Perceived cue to action on utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Health belief constructs	Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (SD)
	Do you believe that the message of the media (e.g. television, radio, internet)	28(7.1%)	14(3.6%)	37(9.4%)	181(46.2%)	132(33.7%)	4.08(.927)

Perceived cue to action	If you have a personal opinion from a trusted family member, friend, or colleague	6(1.5%)	28(7.1%)	18(4.6%)	221(56.4%)	119(30.4%)	4.07(.878)
	When you are faced with campaigns promoting educational materials or fertility	5(1.3%)	16(4.1%)	42(10.7 %)	215(54.8%)	114(29.1%)	4.06(.821)
	It is important to have a reminder or warning from health professionals	12(3.1%)	23(5.9%)	12(3.1%)	218(55.6%)	127(32.4%)	3.96(1.104)

Health Belief Constructs of ANC Utilization after mean score computed

The mean score of respondents was computed for each construct of the health belief model which was framed around utilization of eight ANC contact. Health belief model on utilization of eight antenatal care contacts, Perceived susceptibility a significant majority (71.7%) reported high perceived susceptibility. Perceived severity similarly, 68.6% of respondents perceived a high severity of potential health problems. Perceived benefits, the perception of benefits was high in 63.3% of respondents. Perceived barriers despite the positive perceptions regarding susceptibility, severity, and benefits, 66.1% reported high perceived barriers. Perceived cues to action finally, 74.5% of respondents felt they had high cues to action (Table 11).

Table 11. Health belief model on utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

Variables		Frequency	Percent
Perceived susceptibility	Low perceived susceptibility	111	28.3
	High perceived susceptibility	281	71.7
Perceived severity	Low Perceived severity	123	31.4
	High Perceived severity	269	68.6
Perceived benefits	Low Perceived benefits	144	36.7
	High Perceived benefits	248	63.3
Perceived barriers	Low Perceived barriers	133	33.9
	High Perceived barriers	259	66.1
Perceived to action	Low Perceived to action	100	25.5
	High Perceived to action	292	74.5

5.5 Health Service–Related Characteristics

Of the total 392 participants, 200 mothers (51%) reported that the distance from their home to a health institution was average. For 307 mothers (78.3%), transportation to health institutions for ANC was readily available, and 237 participants (60.5%) experienced a waiting time of less than one hour to complete ANC (Table 12).

Table 12. Health facility related factor utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage zone hospitals, central Ethiopia, 2024

Variables	Category	Frequency	Percent
Distance	Very close	127	32.4
	Average	200	51.0
	Too far	65	16.6
Any transportation system available to go ANC follow up	Yes	307	78.3
	No	85	21.7
Transportation cost	<100 birr	236	60.2
	≥100 birr	156	39.8
Waiting time, you spend to complete checkup	<60 minutes	237	60.5
	≥60 minutes	155	39.5

5.6 Satisfaction of Pregnant Women with ANC Service

Pregnant women's overall contentment with ANC services was measured using sixteen items. Of these, the components with the highest satisfaction scores were the welcoming environment of the institution (226; 57.7%) and the politeness and/or respect of the service provider (228; 58.2%). Nonetheless, the satisfaction of pregnant women with the healthcare provider's explanation of your findings and results was 174 (44.4%) (Table 13).

Table 13. Satisfaction with ANC service utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, Central Ethiopia, 2024

Variables	**Very dissatisfied**	**Dissatisfied**	**Neutral**	**Satisfied**	**Very satisfied**
Welcoming environment of the institution	3(.8%)	21(5.4%)	28(7.1%)	226(57.7%)	114(29.1%)
Service providers introduction of him/herself	11(2.8%)	34(8.7%)	32(8.2)	194(49.5%)	121(30.9%)

Service providers politeness/ respectfulness	9(2.3%)	22(5.6%)	21(5.4)	228(58.2%)	112(28.6%)
Service providers effort to comfort you	11(2.8%)	22(5.6%)	53(13.5%)	191(48.7%)	115(29.3%)
Service providers listening ability during a conversation	13(3.3%)	18(4.6%)	41(10.5%)	215(54.8%)	105(26.8%)
Service providers concern about your problems and issues regarding your pregnancy	12(3.1%)	26(6.6)	40(10.2%)	211(53.8%)	103(26.3%)
Service providers cooperativeness	17(4.3%)	16(4.1%)	23(5.9%)	226(57.7%)	110(28.1%)
Service providers use of terms when he/she try to communicate	14(3.6%)	26(6.6%)	30(7.7%)	195(49.7%)	127(32.4%)
Service providers time spent during your consultation	9(2.3%)	22(5.6%)	30(7.7%)	179(45.7%)	152(38.8%)
Explanation about the drug/medication adequately	16(4.1%)	30(7.7%)	41(10.5%)	154(39.3%)	152(38.5%)
Explanation about the procedure before the examination started.	15(3.8%)	42(10.7%)	43(11%)	164(41.8%)	128(32.7%)
Your role in taking part in the decision-making process	14(3.6%)	24(6.1%)	27(6.9%)	215(54.8%)	112(28.6%)
Gain adequate information about ANC	10(2.6%)	23(5.9%)	25(6.4%)	189(48.2%)	145(37%)
clear and straightforward explanations	13(3.3%)	36(9.2%)	14(3.6%)	184(46.9%)	145(37%)
The procedures cleanliness and sanitation	11(2.8%)	26(6.6%)	21(5.4%)	191(48.7%)	143(36.5%)
Explanation about your result/finding	14(3.6%)	30(7.7%0	20(5.1%)	174(44.4%)	154(39.3%)

Pregnant Women's Satisfaction with ANC Service

Pregnant women's overall satisfaction with Antenatal care services, poor satisfaction with ANC 65 (16.5%), and good satisfaction with ANC 327(83.4% (Figure 3).

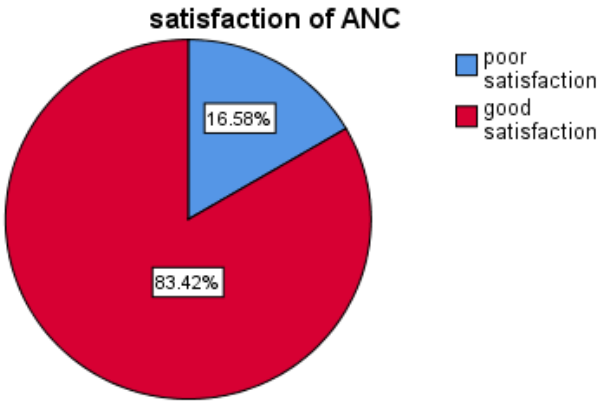

Figure 3 Satisfaction on utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

5.7 Magnitude of Eight Antenatal Care Contacts Follow-up

The recommended eight antenatal care contacts completed by 147 (37.5%; 95% CI: 32.5-42.5%) of the 392 mothers who participated in the current study (Figure 4).

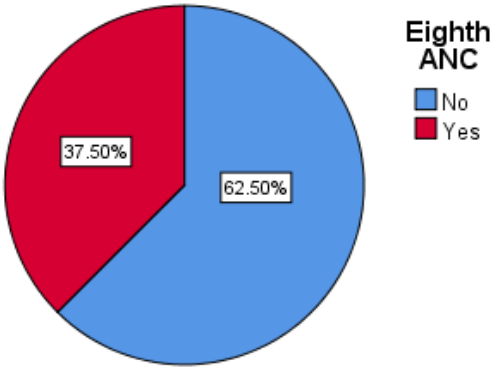

Figure 4 frequency of eight ANC contact utilization of eight Antenatal care contacts and factors associated among postnatal women in Gurage Zone Hospitals, central Ethiopia, 2024

5.8 Factors associated with Eight ANC Contacts

Bivariable logistic regression was performed to screen variables for the final multivariable regression model. Age, residence of participants, marital status, gestational age, knowledge of participants about ANC, perceived cue to action, perceived barriers, perceived benefits, perceived severity, perceived susceptibility and ANC satisfaction all displayed p-values of less than 0.25 in bivariable analysis and were therefore considered for multivariable analysis. The multivariable logistic regression model showed statistically significant association between age less than or equal 20 years (AOR = 3.36(95% CI :1.42-7.92, p = 0.006)), Respondents with age less than 20 years were 3.3 times more likely to eight Antenatal care contacts as compared with those age groups >21 years. residence of participants (AOR = 2.08(95% CI : 1.29-3.35, p = 0.004)).Compared to those living in rural areas, urban dwellers were twice as likely to have eight prenatal care contacts., gestational age (AOR = 3.35(95% CI :1.44-7.77, p = 0.005)), knowledge of participants (AOR = 1.99(95% CI : 1.08-3.67, p = 0.028)), perceived barriers (AOR = 1.78(95% CI : 1.01-3.14, p = 0.046)), perceived cue to action (AOR = 2.37(95% CI :1.28-4.41, p = 0.006)),

and ANC satisfaction (AOR = 2.48(95% CI : 1.13-5.46, p = 0.024)) ,Respondents who were good Antenatal care satisfaction were 2.4 times more likely to eight Antenatal care contacts than those respondents who was poor Antenatal care satisfaction (Table 14).

Table 14. Logistic regression analysis showing associated factors with utilization of eight antenatal care contacts among postnatal mother in Gurage zone hospitals, central Ethiopia, 2024.

Variables		Yes n=147	Frequency N (%)	COR (95%CI)	AOR (95% CI)	p-Value
	≤20	26(17.69)	16(6.53)	3.250(1.611-6.557)	3.358(1.424-7.918)	**0.006***
Age in years	21-29	66(44.9)	119(48.57)	1.109(0.730-1.726)	1.274(0.777-2.088)	0.337
	≥30	55(37.41)	110(44.9)	1	1	
Residence	Urban	96(65.31)	120(49.00)	1.961(1.286-2.990)	2.078(1.288-3.352)	**0.004***
	Rural	51(34.69)	125(51.00)	1	1	
Marital Status	Married	137(93.20)	212(86.53)	2.133(1.018-4.467)	2.021(0.939-4.512)	0.071
	Single	10(6.80)	33(13.47)	1	1	
Gestational age	≤40	124(84.35)	232(94.69)	3.310(1.621-6.761)	3.346(1.442-7.766)	**0.005***
	>40	23(15.65)	13(5.31)	1	1	
Knowledge	Good	118(80.27)	168(68.57)	1.865(1.145-3.037)	1.991(1.079-3.672)	**0.028-***
	Poor	29(19.73)	77(31.43)	1	1	
Perceived susceptibility	High	117(79.59)	164(66.94)	1.926(1.190-3.117)	1.300(0.712-2.374)	0.394
	Low	30(20.41)	81(33.06)	1	1	
Perceived severity	High	114(77.55)	155(63.27)	2.006(1.258-3.198)	1.232(0.673-2.256)	0.499
	Low	33(22.45)	90(36.73)	1	1	
Perceived benefits	High	107(72.79)	141(57.55)	1.973(1.267-3.072)	1.100(0.608-1.989)	0.752
	Low	40(27.21)	104(42.45)	1	1	
Perceived barriers	High	113(76.87)	148(59.59)	2.254(1.422-3.572)	1.782(1.011-3.142)	**0.046***
	Low	34(23.13)	99(40.41)	1	1	
Perceived cue to action	High	128(87.07)	164(66.94)	3.327(1.919-5.770)	2.372(1.276-4.412)	**0.006***
	Low	19(12.93)	81(33.06)	1	1	
ANC satisfaction	High	136(92.52)	191(77.96)	3.495(1.763-6.932)	2.481(1.127-5.460)	**0.024***
	Low	11(7.48)	54(22.04)	1	1	

**** Statistically significant, [1]Reference***

6. DISCUSSION

Using health belief model, the current study was to assess the magnitude of eight ANC use and its factors associated. The finding showed that 37.5% of the postnatal women in Gurage zone hospitals had completed the eight Antenatal care contacts. Magnitude of pregnant women with eight Antenatal care contact was 37.5%; 95% CI: 32.5-42.5%. The factors that directly affect the eight ANC contact were age, residence, gestational age, knowledge of the mother on the eight ANC contacts, perceived barriers, perceived cue to action, and ANC satisfaction. Respondents with age less than 20 years were 3.36 times more likely to have eight Antenatal care contacts as compared with those age group >21 (AOR=3.36). Urban residents were two times more likely to have eight ANC contact than those who were rural residents (AOR=2.08) Respondents who had good Antenatal care satisfaction were 2.4times more likely to have eight Antenatal care contacts than those respondents who was poor ANC satisfaction (AOR=2.40).

This finding is comparable with studies from Ghana (41.9%) (33) and Arba Minch town, southern Ethiopia (41.0%) (59). where the rate of ANC8 was very close. This warrants a s need to strengthen health education and community mobilizations for increased and sustained achievement of ANC8 for better pregnancy outcomes. Moreover, the existing ANC8 coverage further shows disparities by sociodemographic characteristics and other personal factors which could be targeted for such interventions.

On the other hand the finding of this study is higher than the findings from previous study from 15 countries of low-and-medium income countries (13%)-(3).In the multi country study, there was heterogeneity across countries with the highest prevalence in Jordan (74.0%), followed by Ghana (43.0%), and Albania (30.0%). In contrast, the prevalence of eight or more ANC contacts was very low in many countries, including Benin, Senegal, Zambia, Cameron, Mozambique, Mali, Guinea, and Uganda (3). It is also higher than a study from Kasanagati Health center IV, in Wakiso District (5.99%)(60), and sub-Saharan Africa countries the pooled magnitude of eight or more ANC visits (6.8%) (20), which is far below the practice in the current study area.

In the current study younger women are three times more likely to have eight antenatal care follow-ups introduces a nuanced perspective to the discourse on maternal healthcare utilization. This result aligns with some prior research indicating that younger maternal age is associated with

increased antenatal care attendance, possibly due to heightened awareness or healthcare-seeking behavior among this demographic(34). Indonesia(30), multilevel analysis of Ethiopian mini demographic health survey (24),Jordan (31). This divergence underscores the multifaceted nature of healthcare utilization patterns among different age groups.

The finding that women from urban areas are over twice as likely to have eight antenatal care follow-ups presents a compelling insight into the influence of urban residency on maternal healthcare utilization. This outcome resonates with a body of research indicating that urban settings typically offer better access to healthcare facilities, services, and information, thereby facilitating increased antenatal care attendance among urban residents(13,34,35). This result is consistent with the urban advantage which posits that individuals residing in urban areas tend to have improved healthcare access and utilization compared to their rural counterparts mainly due to better education, socioeconomic status and access to health care services. However, these findings also highlight the persistent urban-rural disparity in healthcare access and underscore the necessity of addressing barriers to antenatal care utilization in rural area.

The discovery that women with a younger gestational age and trimester gestational age less than 40 weeks are more than three times as likely to have eight antenatal care follow-ups sheds light on a critical aspect of maternal healthcare utilization linked to pregnancy progression(25,27,36,61,62) This is mainly related the fact that women in advanced gestational age have adequate time to achieve ANC8 than those with earlier gestational age. In addition, previous history of adequate antenatal care is nearly twice as likely to have eight antenatal care follow-ups underscoring the significance of previous antenatal care experiences in shaping current healthcare-seeking behaviors during pregnancy. This finding suggests that women who have received satisfactory antenatal care in the past are more inclined to continue engaging with healthcare services throughout subsequent pregnancies, reflecting a positive reinforcement loop in maternal healthcare utilization.(36). These results are in line with the notion that quality antenatal care not only contributes to improved maternal and neonatal outcomes but also fosters a sense of trust and confidence in the healthcare system, encouraging women to seek care consistently across pregnancies.

Moreover, perceived barriers and perceived cue to action have main influence on the likelihood of women having eight antenatal care follow-ups provides valuable insights into the role of individual

perceptions and obstacles in shaping maternal healthcare utilization patterns. This emphasizes the importance of such as financial constraints, lack of transportation, (15,40,53) or time limitations, on women's decision-making processes regarding antenatal care attendance. High levels of perceived barriers may deter women from seeking timely and comprehensive prenatal care, thereby potentially compromising maternal and fetal health outcomes where interventions targeting these barriers is needed. It is also important to give emphasis on the importance of external stimuli or triggers in prompting maternal healthcare-seeking behaviors. Hence, strong advice from healthcare providers, women's motivation to use antenatal care services is greatly influenced by referrals from friends or family or by exposure to health education initiatives. A strong perceived cue to action can serve as a catalyst for women to prioritize and actively seek prenatal care, leading to enhance maternal and neonatal health outcomes. This difference might be due to the difference of measurement scale, sociocultural difference, and study time period.

The other important factor associated with ANC8 utilization is ANC satisfaction with the service delivery significantly impacting the likelihood of women having eight antenatal care follow-ups. This helps to depict the role of better service positively influencing women to adhere to recommended follow-up visits, and emphasizing the importance of quality care. Enhancing antenatal care satisfaction through personalized care, effective communication, and respectful treatment can foster trust, confidence, and a sense of empowerment among pregnant women, motivating them to prioritize and maintain (63) regular antenatal care attendance. Further exploration into the determinants of ANC satisfaction and its impact on healthcare-seeking behaviors is critical to inform interventions that enhance the overall quality of maternal health services and promote comprehensive antenatal care utilization among pregnant women. Overall, the health believes model findings showed the importance of enhancing perceived benefits and addressing perceived barriers to improve health behaviors. Tailoring interventions to strengthen perceived susceptibility and severity, while simultaneously reducing barriers, can effectively promote health-seeking behaviors among the population.

Limitation of the study

Although the current study employed a rigorous methodology and statistical approach, the findings shall be interpreted in the light of some limitations. The ascertainment of the ANC could be biased by the problems and errors in documenting the ANC service records. Additionally, possibility of social desirability bias could not be l. Cross sectional study ruled out. Because cross sectional study design was implemented in this study, it may not be possible to determine when the cause and effect occurred.

7.CONCLUSION

The utilization of eight Antenatal care contacts among postnatal women in Gurage zone selected hospital is relatively far beyond the universal coverage. This utilization level is associated with age, residence, gestational age, knowledge of the mother on the eight ANC contacts, perceived barriers, perceived cue to action, and ANC satisfaction.

8.RECOMMENDATION

These findings help health care programmers and policymakers to introduce appropriate policies and programs to assure increase eight Antenatal care coverage. Future behavioral change communication strategies shall be in place in addressing the perceived barriers for the use of ANC in addition to targeting the identified factors. Health campaigns targeting uneducated women from rural areas and low perceived susceptibility and higher barriers shall be targeted for awareness creation and behavioral interventions on importance of attending a minimum of eight ANC contacts. WKUSH, Attat primary hospital, Gunchire primary hospital and Gurage zone health office shall employ a mechanism to increase mothers' awareness and understanding on the use of Antenatal care. Furthermore, community health workers, local health offices, NGOs and health extension workers shall involve in enhanced campaigns for better ANC use.

9.REFERENCES

1. Tunçalp, Rosas P. WHO recommendations on antenatal care for a positive pregnancy experience—going beyond survival - Tunçalp - - BJOG_ An International Journal of Obstetrics & Gynaecology - Wiley Online Library/2017. BJOG An Int J Obstet Gynaecol. 2017;124(6):860–2.
2. Organization WH. WHO recommendations on antenatal care for a positive pregnancy experience. World Health Organization; 2016.
3. Ekholuenetale M. Prevalence of Eight or More Antenatal Care Contacts: Findings From Multi-Country Nationally Representative Data. Vol. 8, Global Pediatric Health. 2021.
4. Yehualashet DE, Seboka BT, Tesfa GA, Mamo TT, Seid E. Determinants of optimal antenatal care visit among pregnant women in Ethiopia: a multilevel analysis of Ethiopian mini demographic health survey 2019 data [Internet]. Reproductive Health BioMed Central; 2022 p. 1–8. Available from: https://doi.org/10.1186/s12978-022-01365-2
5. Johnston RB. Arsenic and the 2030 Agenda for sustainable development. Arsen Res Glob Sustain - Proc 6th Int Congr Arsen Environ AS 2016. 2016;12–4.
6. Fenta SM, Ayenew GM, Getahun BE. Magnitude of antenatal care service uptake and associated factors among pregnant women: Analysis of the 2016 Ethiopia Demographic and Health Survey. BMJ Open 2021.
7. Fagbamigbe AF, Olaseinde O, Fagbamigbe OS. Timing of first antenatal care contact, its associated factors and state-level analysis in Nigeria: a cross-sectional assessment of compliance with the WHO guidelines. Vol. 11, BMJ open. 2021. p. e047835.
8. Shiferaw MA, Bekele D, Surur F, Dereje B, Tolu LB. Maternal Death Review at a Tertiary Hospital in Ethiopia. Vol. 31, Ethiopian journal of health sciences. 2021. p. 35–42.
9. Organization WH. Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division: executive summary. 2023;
10. Kohan S, Ghasemi S, Dodangeh M. Associations between maternal health literacy and prenatal care and pregnancy outcome [Internet]. Vol. 12, Iranian Journal of Nursing and Midwifery Research Autumn. 2007. p. 146–52. Available from: www.mui.ac.ir
11. Ekwuazi EK, Chigbu CO, Ngene NC. Reducing maternal mortality in low-and middle-income countries. Case Reports Women's Heal. 2023;39.
12. WHO. WHO Antenatal Care Guidelines. WHO Press. 2016;(March):1–6.
13. Musarandega R, Nyakura M, Machekano R, Pattinson R, Munjanja SP. Causes of maternal mortality in Sub-Saharan Africa: A systematic review of studies published from 2015 to 2020. Vol. 11, Journal of global health. 2021. p. 04048.
14. Maternal Health - PAHO_WHO _ Pan American Health Organization.
15. Fagbamigbe AF, Idemudia ES. Barriers to antenatal care use in Nigeria: Evidences from non-users and implications for maternal health programming. BMC Pregnancy Childbirth. 2015;15(1):1–10.
16. Document U, Comment USE, To F, Epmm T. Strategies toward ending preventable maternal mortality (EPMM). 2015;6736(2013):1–4.
17. Causes of maternal death in Ethiopia between 1990 and 2016: systematic review with meta-analysis | Ethiopian Journal of Health Development [Internet]. Available from: https://www.ajol.info/index.php/ejhd/article/view/182583
18. Gunasekera HR. Demographic and Health Survey--1993. Vol. 1, Sri Lanka journal of population studies. 1998. 107–110 p.
19. Ethiopian Public Health Institute (EPHI), ICF. Ethiopia Mini Demographic and Health Survey 2019: Final Report [Internet]. 2021. 1–207 p. Available from: https://dhsprogram.com/pubs/pdf/FR363/FR363.pdf

20. Tessema ZT, Tesema GA, Yazachew L. Individual-level and community-level factors associated with eight or more antenatal care contacts in sub-Saharan Africa: Evidence from 36 sub-Saharan African countries. BMJ Open. 2022;12(3):1–8.
21. Azanaw MM, Gebremariam AD, Dagnaw FT, Yisak H, Atikilt G, Minuye B, et al. Factors associated with numbers of antenatal care visits in rural ethiopia. J Multidiscip Healthc. 2021;14:1403–11.
22. Belay AT, Fenta SM, Birhan Biresaw H, Abebaw Moyehodie Y, Melkam Yelam M, Mekie M. The Magnitude of Optimal Antenatal Care Utilization and Its Associated Factors among Pregnant Women in South Gondar Zone, Northwest Ethiopia: A Cross-Sectional Study. Deng S, editor. Int J Reprod Med [Internet]. 2022;2022:1415247. Available from: https://doi.org/10.1155/2022/1415247
23. Tessema ZT, Minyihun A. Utilization and determinants of antenatal care visits in East African countries: a multicountry analysis of demographic and health surveys. Adv Public Heal. 2021;2021:1–9.
24. Arefaynie M, Kefale B, Yalew M, Adane B, Dewau R, Damtie Y. Number of antenatal care utilization and associated factors among pregnant women in Ethiopia: zero-inflated Poisson regression of 2019 intermediate Ethiopian Demography Health Survey. Reprod Health [Internet]. 2022;19(1):1–10. Available from: https://doi.org/10.1186/s12978-022-01347-4
25. Ftwi M, Gebretsadik GGE, Berhe H, Haftu M, Gebremariam G, Tesfau YB. Coverage of completion of four ANC visits based on recommended time schedule in Northern Ethiopia: A community-based cross-sectional study design. PLoS One [Internet]. 2020;15(8 August):1–14. Available from: http://dx.doi.org/10.1371/journal.pone.0236965
26. Introduction - WHO antenatal care recommendations for a positive pregnancy experience - NCBI Bookshelf.
27. Ekholuenetale M, Benebo FO, Idebolo AF. Individual-, household-, and community-level factors associated with eight or more antenatal care contacts in Nigeria: Evidence from Demographic and Health Survey. PLoS One [Internet]. 2020;15(9 September):1–19. Available from: http://dx.doi.org/10.1371/journal.pone.0239855
28. Sakeah E, Okawa S, Oduro AR, Shibanuma A, Ansah E, Kikuchi K, et al. Determinants of attending antenatal care at least four times in rural Ghana: analysis of a cross-sectional survey. Glob Health Action [Internet]. 2017;10(1):1291879. Available from: https://doi.org/10.1080/16549716.2017.1291879
29. Muthingu MC, Osero JO, Chomi E. The Perceptions of Women of Reproductive Age towards the Uptake of Focused Antenatal Care Services in Nakuru County. J Med Nurs Public Heal. 2018;1(2):50–67.
30. Denny HM, Laksono AD, Matahari R, Kurniawan B. The determinants of four or more antenatal care visits among working women in Indonesia. Asia Pacific J Public Heal. 2022;34(1):51–6.
31. Hijazi HH, Alyahya MS, Sindiani AM, Saqan RS, Okour AM. Determinants of antenatal care attendance among women residing in highly disadvantaged communities in northern Jordan: A cross-sectional study. Reprod Health. 2018;15(1):2023.
32. Rahman A, Nisha MK, Begum T, Ahmed S, Alam N, Anwar I. Trends, determinants and inequities of 4+ ANC utilisation in Bangladesh. J Heal Popul Nutr. 2017;36(1):1–8.
33. Ekholuenetale M, Nzoputam CI, Barrow A. Prevalence and socioeconomic inequalities in eight or more antenatal care contacts in Ghana: findings from 2019 population-based data. Int J Womens Health. 2021;349–60.
34. Chilot D, Aragaw FM, Belay DG, Asratie MH, Merid MW, Kibret AA, et al. Effectiveness of eight or more antenatal contacts on health facility delivery and early postnatal care in low- and middle-income countries: a propensity score matching. Front Med. 2023;10.
35. Negash WD, Belachew TB, Fetene SM, Addis B, Amare T, Kidie AA, et al. Magnitude of optimal access to ANC and its predictors in Ethiopia: Multilevel mixed effect analysis of

nationally representative cross-sectional survey. PLoS One [Internet]. 2023;18(4 4):1–14. Available from: http://dx.doi.org/10.1371/journal.pone.0284890
36. Abera E, Azanaw J, Tadesse T, Endalew M. Prevalence and associated factors of delay antenatal care at public health institutions in Gondar city, Northwest Ethiopia, 2021: a cross-sectional study. Contracept Reprod Med. 2023;8(1):1–7.
37. Muchie KF. Quality of antenatal care services and completion of four or more antenatal care visits in Ethiopia: a finding based on a demographic and health survey. BMC Pregnancy Childbirth. 2017;17(1):1–7.
38. Bobo FT, Asante A, Woldie M, Hayen A. Poor coverage and quality for poor women: Inequalities in quality antenatal care in nine East African countries. Health Policy and Planning. 2021 Jun 1;36(5):662-72.
39. Yemane GD. The factors associated with antenatal care utilization in Ethiopia. Ann Med Surg [Internet]. 2022;79(May):104092.Available from: https://doi.org/10.1016/j.amsu.2022.104092
40. Yadufashije DC, Sangano GB, Samuel R. Barriers to antenatal care services seeking in Africa. Available at SSRN 3034150. 2017 Sep 8.
41. Adedokun ST, Yaya S. Correlates of antenatal care utilization among women of reproductive age in sub- Saharan Africa : evidence from multinomial analysis of demographic and health surveys. 2020;1–10.
42. Predictors of antenatal care service utilization in Ethiopia: application of the health belief model. In: J Pregnancy. 2019. p. 1–9.
43. Abate MG, Hailu FB, Fanta T, et al. Health education intervention on antenatal care utilization among pregnant women in Ethiopia: a systematic review and meta-analysis. BMC Pregnancy Childbirth. 2021;21(1):1-13.
44. Mekonnen ZA, Lerebo WT, Gebeyehu MT. Predictors of early antenatal care booking among pregnant mothers attending antenatal care in Harar, Eastern Ethiopia. Reprod Health. 2021;18(1):1-10.
45. Deressa LT, Regassa N. Antenatal care service utilization among women of recent delivery: Analysis of the determi-nants of quality of care in selected health facilities in Burayu Town, Oromia. J Clin Images Med Case Rep. 2021;2(6):1449.
46. Negero MG, Sibbritt D, Dawson A. Women's utilisation of quality antenatal care, intrapartum care and postnatal care services in Ethiopia: a population-based study using the demographic and health survey data. BMC Public Health. 2023 Jun 19;23(1):1174.
47. Abera E, Azanaw J, Tadesse T, Endalew M. Prevalence and associated factors of delay antenatal care at public health institutions in Gondar city, Northwest Ethiopia, 2021: a cross-sectional study. Contraception and Reproductive Medicine. 2023 Jan 16;8(1):2.
48. Sripad P, Kirk K, Adoyi G, Dempsey A, Ishaku S, Warren CE. Exploring survivor perceptions of pre-eclampsia and eclampsia in Nigeria through the health belief model. BMC Pregnancy Childbirth. 2019;19(1):1–11.
49. Gupta S, Yamada G, Mpembeni R, Frumence G, Callaghan-Koru JA, Stevenson R, et al. Factors associated with four or more antenatal care visits and its decline among pregnant women in Tanzania between 1999 and 2010. PLoS One. 2014;9(7).
50. Alemu DA, Zegeye AM, Zeleke LB, Dessie WK, Melese YD, Tarik YD, et al. Pregnancy Risk Perception and Associated Factors among Pregnant Women Attending Antenatal Care at Health Centers in Jabi Tehnan District, Amhara, Northwestern Ethiopia, 2021. Int J Reprod Med. 2022;2022:1–9.
51. Diddana TZ, Kelkay GN, Dola AN, Sadore AA. Effect of nutrition education based on health belief model on nutritional knowledge and dietary practice of pregnant women in Dessie Town, Northeast Ethiopia: A cluster randomized control trial. J Nutr Metab. 2018;2018.
52. Hackett K, Lenters L, Vandermorris A, LaFleur C, Newton S, Ndeki S, et al. How can engagement of adolescents in antenatal care be enhanced? Learning from the perspectives of

young mothers in Ghana and Tanzania. BMC Pregnancy Childbirth. 2019;19:1–12.
53. Tungaraza MB, Joho AA. The health belief model and self-determination theory in explaining the use of antenatal care services: a cross-sectional study. Afr J Midwifery Womens Health. 2022;16(2):1–11.
54. Town SE, Town S, Town A. Eastern Tigray-Zone Western Tigray-Zone Mekele Special-Zone. 2024;(July).
55. Antenatal L, Booking C, Factor A, Pregnant A, In W, West S. College of Health Sciences School of Nursing & Midwifery Late Antenatal Care Booking and Associated Factor Among Pregnant Women in Mizan-Aman Town , South West Ethiopia , 2021 : a Mixed Study Method . College of Health Sciences , School of Nursing and Mid. 2021;
56. Sembilan N. Knowledge , attitude and practice on antenatal care among Orang Asli women in ORIGINAL ARTICLE KNOWLEDGE , ATTITUDE AND PRACTICE ON ANTENATAL CARE AMONG ORANG ASLI WOMEN IN JEMPOL , NEGERI SEMBILAN. 2015;(December).
57. Seyoum Alemu, Degemu Sahlu MM. Perceived Susceptibility to Pregnancy , Contraceptive Use and Associated Factors Among College Female Students in Fitche Town , Oromia ,. 2024;5015:5015.
58. Zamawe C, Banda M, Dube A. The effect of mass media campaign on Men's participation in maternal health: A cross-sectional study in Malawi. Reprod Health. 2015;12(1).
59. Dinagde DD, Feyisa GT, Afework HT, Chewaka MT, Wada HW. utilization and its associated factors among pregnant women. 2024;(July):1–9. Available from: https://doi.org/10.3389/fgwh.2024.1259637
60. Rika Widianita D. Evaluating the implementation outcome "acceptability" of the Eight (8) Antenatal Care contacts, and modelling the predictors that determine compliance by women attending Antenatal care clinics in Wakiso district. AT-TAWASSUTH J Ekon Islam. 2023;VIII(I):1–19.
61. Desta DZ. The dropout rate and associated factors of the continuum of maternal health care services before and during Covid-19 Pandemic among women who gave birth in the last two years in Addis Ababa , Ethiopia , 2021 . A comparative cross-sectional study design. 2021;
62. Akum LA, Offei EA, Kpordoxah MR, Yeboah D, Issah AN, Boah M. Compliance with the World Health Organization's 2016 prenatal care contact recommendation reduces the incidence rate of adverse birth outcomes among pregnant women in northern Ghana. Vol. 18, PLoS ONE. 2023.
63. Birhanu S, Demena M, Baye Y, Desalew A, Dawud B, Egata G. Pregnant women's satisfaction with antenatal care services and its associated factors at public health facilities in the Harari region, Eastern Ethiopia. SAGE Open Med. 2020;8.

10. ANNEX_ QUESTIONNAIRE

WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DEPARTMENT OF NURSING

Verbal Consent Form

Good morning / Good afternoon

My name is _____. I am MSc student from Wolkite University. As part of my academic requirements, I am expected to conduct research. The study is Prevalence of eight ANC contacts and associated factor among postnatal women at Wolkite University Specialized Teaching Hospital, Gunchira primary hospital and Attate primary hospital, Wolkite, central Ethiopia. Thus, this interview is prepared for this purpose to get appropriate information on the topic. The information that will be obtained using this interview will be used only for research purpose and also confidentiality is assured. Therefore, I politely request your cooperation to participate in this interview. You do have the right not to respond at all or to withdraw in the meantime, but your input has great value for the success of the objectives the research.

The study title: level of eight Antenatal care contacts and associated factors among postnatal women in Gurage zone selected hospital, Central Ethiopia, 2023/2024

Purpose/Aim of the study: The purpose of this study is to write the thesis as a partial requirement for the fulfillment of a Master's Degree in Maternity and Reproductive health nursing for then researcher. Eventually, the study finding will be contributed as a source or evidence about level of eight Antenatal care contacts and associated factors among postnatal women in Gurage zone selected hospital, Central Ethiopia.

Procedures and duration: I will collect data from clients by using a well-structured questionnaire. There are eight parts in the questioner and this questionnaire may take 20 to 30 minutes to complete, so I kindly request you spare me this time and help me with that.

Risk and benefit: The risk of participating in this study is very minimum, only contributing their time (about 20 to 30 minutes). However, there is no direct payment for participating in this study. The findings from this research give valuable Information about the risk perception and associated factors for postnatal mothers

Confidentiality: The information that you provide will be kept confidential. No information will identify the participants in particular. The findings of the study will be general for the study population and will not reflect anything particular for individual persons. The questioner will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: Participation in this study is fully voluntary. The participants have the right to declare participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefits, which they otherwise are entitled.

Persons to contact: If there are any study questions, you can contact him at the following address.

Mobile no 09-21537022 E mail aminaali227053@gmail.com

Would you be willing to participate in this interview?

Did you agree? 1. Yes continue 2. No stop

Thank you for your cooperation!!!

Interviewer name _____ signature _____ Date_____

Questionnaire prepared for cross sectional study on utilization of eight ANC contacts and associated factors among postnatal women in selected hospital West Gurage zone, central Ethiopia,2024.

Part I: Identification		
101	Identification number: _____	Response
102	Health Facility	1. WUSH 2. Attate Primary Hospital 3. Gunchira Primary Hospital
Part II: sociodemographic characteristics		
Code	Questions	Response
201	Age in years	_____ years
202	Address	1. Urban 2. Rural
203	Ethnicity	1. Gurage 2. Kabana 3. Amhara 4. Wolita 5. Oromo 6. Other, specify_____
204	Religion	1. Muslim 2. Orthodox 3. Catholic 4. Protestant 5. other, specify_____
205	Marital status	1. Married 2. Single 3. Divorced 4. Widowed
206	What is your educational Status	1. Unable to read and write 2. Can read and write 3. Primary school 4. Grade 9-12 5. College and above
207	What is your partner educational level?	1. Unable to read and write) 2. grade 1-4 3. grade 5-8 4. grade 9-12 5. Greater than grade 12
208	What is your occupation	1. Government / Private employee 2. House wife 3. Merchant 4. Daily laborer 5. Farmer 6. Student 7. Others (specify) _____

209	What is husband main occupation?	1. Private employee 2. Student 3. Government employed 4. Merchant 5. Farmer 6. Daily laborer 7. others specify _____
Part III: Economic status Assessment		
Code	**Questions**	**Response**
301	What is your household income level?	_____ birr
302	Who is the decision maker in your house?	1. You 2. Your husband 3. Both of you 4. Others _____

Part III: Knowledge of mothers on ANC

Code	**Questions**	**Response**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
401	Do pregnant women need to go for antenatal check-up?					
402	Should first antenatal check-up be done in the first 3 months?					
403	Does pregnant woman need vitamin supplement?					
404	Does maternal smoking harmful to the fetus?					
405	Should you take alcohol to provide extra energy during pregnancy?					
406	Does pregnant woman need to come for at least five antenatal follow up throughout her pregnancy?					
407	Can a pregnant woman go to the clinic for antenatal follow-up?					
408	**Should a pregnant woman see the doctor for antenatal care only if she has pregnancy complication?**					
409	Blood screening for Hepatitis B infection					
410	Blood screening for HIV infection					
411	Blood screening for hemoglobin level					

412	Blood pressure examination					
413	Blood sugar level					
414	Urine test for bacterial infection					
415	Can high blood pressure affect the fetus growth?					
416	Do diabetic women have higher risk of having big babies?					
417	Is ultrasound scan safe for the fetus?					
418	Is antenatal class good to prepare expecting mothers mentally?					
419	Can emotional disturbance affect fetal growth?					
420	Should women deliver in the hospital for their first pregnancy?					

Part V: Obstetric factors		
Code	**Questions**	**Response**
501	Parity	_____
502	Gravidity	_____
503	Gestational age at delivery	_____ weeks
504	Have you ever experienced pregnancy complications?	1. Yes 2. No
505	If your answer is yes for question number 504, what type of complication did you experience?	1. APH 2. Abortion 3 Preeclampsia 4. PPH 5. Still birth 6.preterm birth 7 .Specify other___
506	Have you ever delivered by caesarean section?	1. Yes 2. No
507	History of multiple pregnancy	1. Yes 2. No

Part VI: Questions on perceived susceptibility (please make "X" mark on the correct response		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
6.1. Perceived Susceptibility						
Code	**Questions**					
601	It is extremely I will get pregnancy-related complications					
602	I fear I will have a difficult pregnancy period					

603	There is a good possibility I will get complications related to delivery and the postpartum period					
604	My chances of getting pregnancy-related complications are great					
605	I am more likely than the average woman to get bad pregnancy outcome					
Part 6.2: Questions on the perceived severity						
606	Problems I would experience with pregnancy and delivery would last a long time.					
607	Pregnancy complications would threaten the relationship with my partner					
608	Pregnancy-related complications can lead to permanent changes in life.					
609	My pregnancy would not last to term					
610	I am scared my baby would not survive the pressure that comes with labour and delivery.					
611	If I got pregnancy-related complications, I fear I won't survive it.					
612	I fear my baby will be born prematurely					
	6.3. Perceived benefits					
613	If I got proper ANC, my risk of complicated pregnancy would decrease.					
614	Through proper ANC, I am able to get proper diagnosis and treatment.					
615	Properly attending ANC could help me get health.					
616	Through timely ANC, I can get timely healthy counseling.					
	6.4. Perceived barriers					
617	My husband or family usually do not support me to get timely ANC.					
618	The costs associated with ANC usually makes me not to attend ANC.					
619	I personally do not believe that ANC is beneficial and hence, I may prefer not to go for ANC.					
620	The quality of ANC service at health facility is not conducive for me to have timely ANC.					
621	My work condition do not allow me to have timely ANC.					
622	Due to discomfort and other issues while pregnancy makes me not t go for ANC					
	6.5. Perceived Cue to Action					
623	It is important to have a reminder or warning from health professionals or professionals about scheduling and attending maternity care appointments					
624	If you have a personal opinion from a trusted family member, friend, or colleague about pregnancy and life care, you think you are doing pregnancy monitoring					
625	When you are faced with campaigns promoting educational materials or fertility					

	treatment, you think you are prepared to take care of pregnancy					
626	Do you believe that the message of the media (e.g. television, radio, internet) about the importance of childcare is relevant to how it influences your decision to do so?					

Part 7: Health service-related factors						
Code	**Questions**	**Response**				
701	How do you feel about the distance from your home to this health institution?	1.Very close 2. Average 3. Too far				
702	Is there any transportation system available to go to the health institution for ANC follow up?	1. Yes 2. No				
703	Transportation cost that you paid for coming & back to this health service	----------birr				
704	What is the maximum waiting time you spend to complete checkup?	____ minutes				
Pregnant Women's Satisfaction with ANC Service		**Response**				
		Very Dis-satisfied	**Dis-satisfied**	**Neutral**	**Satisfied**	**very satisfied**
705	Welcoming environment of the institution					
706	Service provider's introduction of him/herself					
707	Service provider's politeness/ respectfulness					
708	Service provider's effort to comfort you					
709	Service provider's listening ability during a conversation					
710	Service provider's concern about your problems and issues regarding your pregnancy					
711	Service provider' cooperativeness					
712	Service provider's use of terms when he/she try to communicate					
713	Service provider's time spent during your consultation					
714	Explanation about the drug/medication adequately					
715	Explanation about the procedure before the examination started.					

716	Your role in taking part in the decision-making process					
717	Gain adequate information about ANC					
718	clear and straightforward explanations					
719	The procedures cleanliness and sanitation					
720	Explanation about your result/finding					
Part 8: History of current ANC						

801	How many times did you contact the health facility for pregnancy checkups or follow ups while your recent pregnancy? (please record this from the mother card, referral paper and ANC follow up) _____ times				
802	No of contact	Have this visit? (Yes or No		When (gestational age) if yes	Remark
1	First	Yes	No		
2	Second	Yes	No		
3	Third visit	Yes	No		
4	Fourth	Yes	No		
5	Fifth	Yes	No		
6	Sixth	Yes	No		
7	Seventh	Yes	No		
8	Eighth	Yes	No		
9	Greater than eighth	Yes	No		