



**ARSI UNIVERSITY COLLEGE OF HEALTH SCIENCES DEPARTMENT
OF MIDWIFERY**

**ADHERENCE TO EIGHT OR MORE ANTENATAL CARE MODEL AND
ASSOCIATED FACTORS AMONG POSTPARTUM MOTHERS AT
PUBLIC HEALTH FACILITIES OF SULULTA DISTRICT, NORTH
SHEWA ZONE, OROMIA, ETHIOPIA, 2024**

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Abbreviations

ANC	Antenatal care
AOR	Adjusted Odds Ratio
ARTH	Asella Referral and Teaching Hospital
CI	Confidence Interval
COR	Crude Odd Ratio
CSA	Central Statistical Agency
EDHS	Ethiopian Demographic and Health Survey
LMIC	Low- and Middle-Income Countries
MMEIG	Maternal Mortality Estimation Interagency Group
MMR	Maternal mortality rate
OR	Odds Ratio
PNC	Postnatal Care
SPSS	Statistical package for Social Sciences
SSA	Sub-Saharan Africa
WHO	World Health Organization

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Abstract

Background: To reduce pregnancy and childbirth complications, adequate antenatal care (ANC) contacts during pregnancy is vital. By recognizing basic ANC were associated with high maternal mortality, WHO revised its ANC guidelines in 2016, which recommends all pregnant women to have at least eight contacts. However, ANC coverage is low worldwide, 53.3% in East Africa including Ethiopia received the recommended care. Although there are few studies conducted in Ethiopia, information on adherence level to the 8+ ANC at health Facilities in Sululta woreda is lacking.

Objective: To assess the adherence level to 8+ antenatal care model and associated factors among postpartum mothers at Sululta district public health facilities, Oromia: Ethiopia, 2024.

Methods: An institutional based cross-sectional study was conducted at public health facilities of Sululta District from October 10 to November 10, 2024. A systematic random sampling technique was used to select 410 study participants. Logistic regression models were used, and odds ratios with 95% CI and p value <0.05 was used to determine the association between dependent and independent variables.

Results: The overall level of adherence to new 8+ ANC model during this study was 25.4%. Residence of mother's (AOR:3.060, 95%CI:1.166, 8.034), Previous mode of delivery (AOR: 3.329, 95%CI:1.390, 7.974), History of obstetric complication (AOR:6.162, 95%CI:2.693, 14.099), Maternal satisfaction (AOR: 6.775, 95%CI:2.460, 18.657) and type of health facility for ANC (AOR:2.945, 95%CI:1.242, 6.928) were significantly associated with new 8+ antenatal care model.

Conclusion and Recommendation: The adherence level of mothers to the new 8+ ANC model among post-partum women at public health facilities of sululta district was low. Therefore, it needs a great effort by health care providers, health care managers and responsible bodies to provide quality and satisfactory service, giving special attention of pregnant women from rural residents to maximize adherence to the new 8+ ANC model.

Keywords: Antenatal care, pregnancy, adherence, 8+ ANC model, Oromia Ethiopia

1. INTRODUCTION

1.1. Background

Antenatal care (ANC) is an effective intervention of skilled health professionals for minimizing the risk of pregnancy-related complications and maintain good pregnancy outcomes(1). ANC is crucial for monitoring the health of the mother and the baby, detecting any potential complications early, and providing necessary interventions, also offers education and support for a healthy pregnancy and childbirth experience(2). One of the methods that has been demonstrated to lower maternal and newborn fatalities is the timely and increasing frequency of high-quality Antenatal Care (ANC) contacts(3).

Before this, World Health Organization (WHO) advised all pregnant women who were not at risk to have at least four focused ANC visits, which are goal-oriented clinic-centered ANC visits (4). However, in order to maximize ANC quality and enhance outcomes for mothers, fetuses, and newborns, in 2016 WHO advised all pregnant women to have at least eight ANC visits. Additionally, the term "visits" has been replaced with "contact," which aims to foster closer communication between health professionals and pregnant mothers rather than merely increasing follow-up numbers(5). The goal of this guideline is to reduce perinatal deaths by up to 8 per 1000 births when compared to a minimum of four visits and to reduce worldwide maternal mortality ratio to less than 70 per 100,000 live births, and 12 per 1,000 live births reduction in neonatal mortality by 2030(6), through providing pregnant women with respectful, individualized, person-centered care at every contact(7). Accordingly, the first antenatal care contact should occur prior to 12 weeks of pregnancy, followed by two encounters during the second trimester and five contacts during the third(8). The new WHO ANC model encourages a more active relationship between pregnant women and their healthcare providers compared to the previous four-visit-focused model(9).

As it is known that, institutional delivery is one strategy to decrease maternal and child mortality and morbidity, study conducted in low-and middle-income countries indicates a positive relationship between adhering to the new 8+ ANC contacts and health facility delivery by 14%(10). The utilization of eight or more ANC visits is only 6.8% in Sub-Saharan Africa(11)

and, according to recent findings, only 3% of pregnant women in Ethiopia attended the recommended eight ANC visits during their pregnancies(12).

1.2. Statement of Problems

The overall number of mothers dying from issues or causes related to pregnancy and childbirth has declined globally, but it is still high in low- and middle-income countries (LMICs)(9). In 2020, a woman dies of pregnancy-related causes every two minutes globally, the maternal mortality ratio in the African Region was 531 deaths per 100 000 live births, which accounts for 69% of global maternal deaths(13). Nearly all of the child deaths (98%) and maternal deaths (99%) took place in low- and middle-income nations., Sixty percent of the stillbirths (1.46 million) occurred during the antepartum period and mainly due to untreated maternal infection, hypertension, and poor fetal growth(14).

In the African region, maternal mortality is still a major problem for women who are of reproductive age. Even though maternal mortality has decreased globally, the Africa area continues to experience a catastrophe, accounting for over two-thirds (69%) of all maternal deaths in 2020(15). Perinatal mortality is high among those who do not receive prenatal care, according to empirical data. However, ANC coverage is low worldwide, globally, only about 64% of women go to the recommended visits(15). The prevalence of appropriate ANC use in Africa was 53.4% in Eastern Africa and 58.5% in Sub-Saharan Africa in 2020(16).

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One of the main issues in SSA is the lack of appropriate and quality antenatal care services. More than 90% of expectant mothers in the majority of sub-Saharan African nations received at least one prenatal care visit, indicating high levels of access; however, this does not necessarily translate into high levels of coverage of ANC quality(12)(17). Ethiopia is among the Sub-Saharan African nations where 19,000 maternal fatalities occur annually(7). Additionally, Ethiopia has a high rate of maternal deaths (412 per 100,000 live births)(15).

The number of ANC contacts throughout pregnancy is essential to minimize pregnancy and delivery complication. Inadequate prenatal care visits, late appointments, or less than the recommended number of contacts have all been associated with poor pregnancy outcomes, despite the fact that ANC alone lowers maternal mortality by 20%(8). By identifying pregnancy-related problems and increasing the number of deliveries at a medical facility, attending the

recommended number of antenatal care appointments may help to lower maternal morbidity and mortality(18).

Since this new policy of eight ANC contacts was more recently adopted in the health system of Ethiopia, there was little related research conducted on this topic to the researcher's knowledge. Therefore, it's very important to assess adherence to the new eight or more antenatal care and its associated factors among mothers at postpartum women in the sululta district, north Shewa Oromia, Ethiopia.

1.3. Significance of the study

This study was proposed to assess adherence to eight or more antenatal care model and its associated factors among mothers at postnatal care in the Sululta district. Therefore, the results of the study will be helpful for designing appropriate locally strategies that improve adherence of new antenatal care model by mothers, immediately after getting pregnant.

The study's findings will be used by the Sululta district health office to mobilize and sensitize the community to increase adherence to new antenatal care model by increasing awareness of maternal health services, specifically about Eight contact antenatal care model. The study's findings assist in the development of recommendations and actions that improve the district's adherence to Eight contact antenatal care model.

Furthermore, this study will try to bring to light some very important socio-demographic factors that determine the adherence to Eight contact antenatal care model immediately after getting pregnant in the district. This study will help program planning bodies and service providers plan and provide more efficient adherence to new model of antenatal care counseling at both facility and community level. It also hopes that the results of this study will serve as a baseline for future studies to enhance adherence to eight contact antenatal care model and its determinants.

2. LITERATURE REVIEW

2.1. Adherence to ANC eight or more contacts

A study conducted in Bangladesh states only 6% receive the recommended minimum eight ANC contacts (19). The weighted prevalence of eight or more ANC contacts was 41.9% according to the study conducted in Ghana(20). Study conducted in Nigeria revealed that the prevalence of eight ANC contacts was 17.4% (21). Another study conducted in Cameroon show that only 8.9% of women had at least eight ANC contacts(22). The study conducted in Benin indicates that only 8% of women receive recommended ANC contact during their pregnancy period(23).

Prenatal care utilization in Ethiopia is insufficient when compared to WHO guidelines, and ANC service consumption varies by area within country (19). Receiving ANC services from qualified providers has increased over time, from 28% in 2005 and 34% in 2011 to 62% in 2016 and 74% in 2019, according to the mini-EDHS 2019 study. Disparities exist in various settings, even while trends of rising ANC care utilization are still insufficient (24).

Another study conducted in Ethiopia indicates that more than one fourth of pregnant women obtained adequate ANC content (27.8%)(25). The study conducted in Ethiopia to investigate, “the reason why ANC remains low” shows that only 3% of pregnant mothers adhere (attained all the recommended schedules) to 8+ ANC(12). According to the study done in the north west of Amhara region of Ethiopia 88.8% women had the intention to use ANC 8(15). The study investigated in southern nation Arbaminch town revealed that the optimal level to WHO ANC 8 contact was 41%(26).

2.2. Factors associated with adherence to 8 or more ANC contacts

Previous studies showed that factors associated with adherence to eight ANC contacts, these include demographic, socioeconomic, obstetrics factors and health care related factors such as maternal age, place of residence, maternal education(27), wealth, exposure to mass media, parity, late ANC booking, previous mode of delivery, pregnancy intention, history of obstetric complication, maternal decision making, whether supported by partner or not, maternal knowledge regarding receiving antenatal care, health education and waiting time during ANC as well as compassionate respectful care had a significant effect on women's adherence to the recommended ANC visits(25).

2.2.1. Socio-demographic related factors

According to a Nigerian study, pregnant women with more education had a twelve-fold higher chance of obtaining the recommended eight or more ANC contacts than those without any formal education(3). A study carried out in Ethiopia found that women with primary school education were 22% more likely to use 8+ ANC than those without formal education, and that women with secondary school education and higher were 26% more likely to attained 8+ ANC(12).

The use of ANC may also be impacted by young pregnant women's lack of experience with pregnancy care in comparison to older pregnant women.(7). Additionally, Study conducts in Northwest of Amhara Region Ethiopia in 2021 Women with the age group of between 20 to 30 and ≥ 31 years old had higher odds of intention to use 8+ ANC as compared to those < 20 years(15).

Previous study done in Nigeria shows that most (96.5%) antenatal care service users were employed women(28). The women who had adherence to ANC8+ were employed either with government or private sector. Farmer pregnant women were 87% less likely to adhere the service as compared to homemakers. A study from Ghana also show pregnant women adherence to a new eight antenatal care model was too low among poorest as compared to richest(20).

Socioeconomically, government workers were easier to handle effectively. Maintaining the cost of transportation, medication, and other prenatal care-related wastes is crucial. To acquire knowledge and gain a positive awareness of prenatal care services, television and other social media platforms are crucial(29). Being employed by the government was found to be a strong predictor of adherence to using ANC 8 contact, according to a study done at hospitals in the Amhara region. Therefore, ANC 8 contact was more likely to be used by government-employed women than by housewives(15).

2.2.2. Obstetric history related factors

Study conducted in Zambia, Wakiso district show that higher parity was a barrier to adherence of 8+ antenatal care contacts than in primigravida(30). Similarly women of high parity initiate ANC late and make fewer contacts, reducing their chances of receiving quality ANC(22). Study conducted in Uganda reveals similar findings, parity of greater than or equal to 2 had lower odds

of attending the recommended eight ANC visit schedule(31). ANC attendance is actually resisted by women of grand multi pregnancies; when they do, it is typically after the second trimester, as they claim to have adapted to managing the common mild pregnancy disorders(32).

The likelihood of using recommended ANC was 1.18 times higher for women who desired pregnancy than for those who did not. Similarly, A meta-analysis of Sub-Saharan countries' DHS data was shown that Unwanted pregnancy might unwilling to seek ANC visit. Besides, an unintended or unexpected pregnancy could have had a negative impact. on mother's utilization of ANC services(33).

Birth experience was linked to early prenatal care booking and adherence to the new WHO ANC model, according to a study conducted in the Gedeo zone, SNNP region, central zone of Tigray, and Adigrat, Tigray(34). In a similar vein, research conducted in Zambia and the UK revealed that multiparous women were more likely than primiparous women to start ANC early(35).

2.2.3. Knowledge related factors

By preserving women's self-regulation, knowledge has the most direct impact on behavior when it comes to perform prenatal care contact, the usage of antenatal care services will be guaranteed due to the increase in women's self-regulation(15). Therefore, knowledge has a positive and unidirectional impact on the use of prenatal care. If people knew more, they would use antenatal care more frequently. Pregnant women who are well-informed about ANC 8 are more likely to practice it on the ground level (36).

The factors that promote pregnant women to use ANC include having taken maternal health education, being educated, having knowledge of risk indicators and obstetric history, and having a husband who works "other than farming"(30). Of the females who had not made use of ANC, the main explanations for not using ANC were absence of illness during pregnancy, lack of awareness about ANC, and those who have taken health education on maternal health were more likely to use ANC service(37). As demonstrated study conducted in Ghana, low literacy levels might contribute to decrease adherence to new ANC model of WHO, and higher education levels associated with literacy, increase adherence. Health literacy, or an individual's ability to find, understand, and use healthcare, also has the ability to influence care-seeking behaviors of an individual as well as those around them(38). Participants in new ANC care models, like group

ANC care, have shown increased health knowledge.(39) as well as the potential to improve communication among participants(40).

In terms of understanding of the new ANC model, a study carried out in the Gedeo zone, Ambo town, and central Tigray showed that women who were told when to make their reservations were more likely to start ANC earlier than those who were not. Women who had adequate knowledge about when to start ANC were more likely to schedule an appointment on time and finish ANC 8(41), (42), (43).

2.2.4. Health related factors

Poor ANC quality was found to be an obstacle to ANC service and utilization in 49 studies(44), and women were less likely to adhere to WHO guidelines for ANC if they believed they received poor quality treatment in health facilities. Women also cited long waiting times, a lack of compassionate, respectful care from providers, and shortage of resources (e.g., ultrasound machines, laboratory investigation, medications, providers, etc.) as reasons for poor quality of care(9).

On the other hand, having better access to public and private healthcare facilities, as well as superior social amenities and mass media exposure for knowledge, is more common in urban and plain areas(45). Women who received Counselling during ANC visits used ANC more frequently 1.7 times than women who did not get Counselling(46).

The effects of long distances to the health care facilities compounded by the lack of transportation to health facilities have been reported in many previous studies(47). According to earlier research, pregnant women tend to fewer utilization prenatal visits in order to save money on travel and avoid feeling exhausted, therefore the farther they away from medical facilities, the fewer prenatal visits they make(48).

2.2.5. Partner support related factors

Pregnancy places a great deal of strain on a woman's physical, mental, social, and emotional health before, during, and after childbirth. Therefore, it is a vital that males partners and other

family members receive early information on crucial pregnancy care, so that they can comprehend and value the discomfort and fatigue that happened due to pregnancy(49).

Evidence also showed that adherence to the WHO's revised ANC contact approach is significantly increased by family, friends, or social support. The support could take numerous forms, such as counsel and informational assistance or emotional support in the form of affection and attention for the ANC service. Additionally, instrumental support whether it be material or time-related was beneficial in favorably influencing adherence(15).

Compared to their counterparts, women who had their partners' support were twice as likely to get all advised prenatal checkups(26). As the study conducted to assess the role of male partner participation in maternal care service utilization in Ethiopia reveals that women whose partners took time to know what happened in their ANC visits were 2 times more likely to have their 1st ANC visit within the first trimester(50). As study conducted in Arbaminch southern Ethiopia to assess the new WHO recommendation antenatal care utilization and associated factor indicates those mothers whose husbands were involved in ANC were twice as likely to have optimal antenatal care compared to those who don't supported by their partners(26).

2.2.6. Mothers' satisfaction with antenatal care service utilization

Mother center care can lead to better health outcomes, increased levels of mother satisfaction, and better adherence to treatment plans(51).

Satisfaction of pregnant mothers on antenatal care services, an indirect indicator of quality in health service organizations, showed that the services were of high quality. Women's satisfaction with ANC services indicates that their expectations have been fulfilled(52).

2.2.7. Mothers' decision-making related factors

Women who had more autonomy, particularly financial autonomy and more decision-making skills had higher ANC uptake, and many studies reported that getting permission from their husbands was another barrier to accessing ANC(53). Furthermore, women who decide by themselves and who did know that power to decide for seeking health facility was themselves were more likely to use ANC and meet the recommendation of ANC contacts(54). As the study conducted in Nigeria to assess association between decision making power of women and maternal healthcare utilization indicates that the odds of women with more autonomy are

significantly 3.8 times more likely to complete the recommended ANC services than those women with low decision making power(55).

Study conducted in Arbaminch town revealed that autonomous mothers were 3.9 times more utilize recommended ANC contacts by 3.9 folds compared to those mothers didn't participate on decision making process(26).

2.3 Conceptual frame work

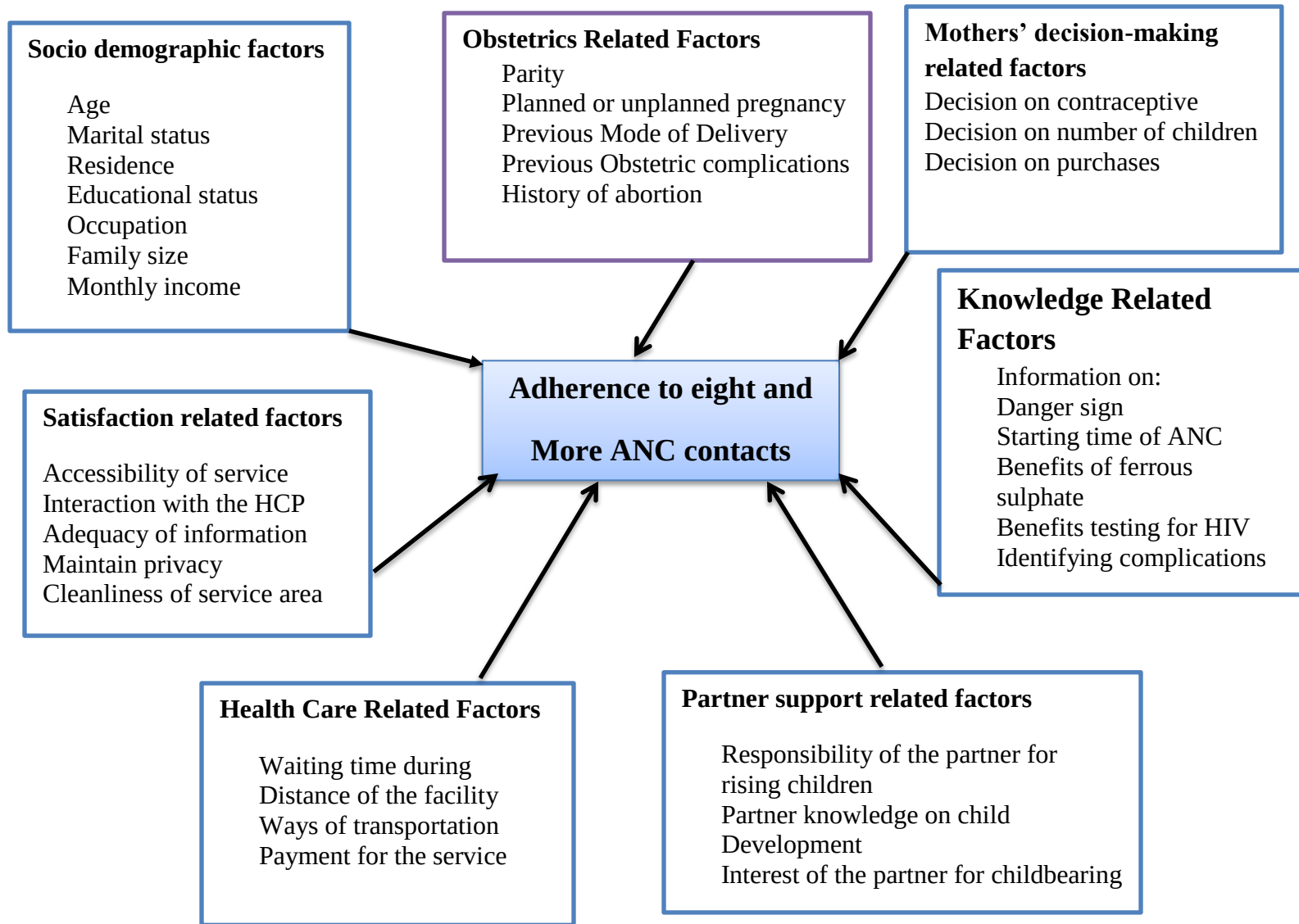


Figure 1: Conceptual frame work to assess Adherence to Eight Antenatal Care Model and Associated Factors among postpartum mothers at sululta district north Shewa Oromia: Ethiopia 2024 (1)(26),(23).

3. OBJECTIVE

3.1. General Objective

- To assess Adherence level to 8+ Antenatal Care Model and Associated Factors among postpartum mothers at public health facilities of sululta district north Shewa, Oromia, Ethiopia 2024

3.2. Specific Objectives

- To assess Magnitude of Adherence to 8+ Antenatal Care Model Among postpartum mothers at public health facilities of sululta district, north Shewa, Oromia, Ethiopia 2024
- To identify factors associated with Adherence to 8+ Antenatal Care Model Among postpartum mothers at public health facilities of sululta district, north Shewa Oromia, Ethiopia 2024

4. METODS AND MATERIALS

4.1.Study area and period

This study was conducted in Sululta district from October 10 to November 10, 2024. Sululta is one of the districts in Oromia, located at the north western of Addis Ababa, Ethiopia. In this district, there are six health centres and one primary hospital. From these two health centres are not fully serving because of security issues. According to sululta district health office, the total population of 2024 is estimated to be 199,000. Women who are in child bearing age group (15-49) were 32,899. The average annual delivery load for this district health centres and hospital were 6,644 and that of first postnatal visit was 7,104.

4.2. Study design

Institutional based cross sectional study design was employed

4.3. Populations

4.3.1. Source Population

All mothers who had ANC contacts and were admitted to the postpartum unit at public health facilities of Sululta district.

4.3.2. Study population

All mothers, who had antenatal care contacts and were admitted to postpartum unit at selected public health facilities of Sululta district during the study period.

4.3.3. Study unit

All selected mothers, who had antenatal care contacts and were admitted to postpartum unit at selected public health facilities of Sululta district during the study period.

4.4.Inclusion and exclusion criteria

4.4.1. Inclusion criteria

All mothers who had ANC follow-up and admitted at postpartum care unit during the study period, who were willing to participate in the study

4.4.2. Exclusion Criteria

Mothers, who had come by referral, do not have ANC follow up file, and severely ill Mothers.

4.5. Sample size determination

Sample size was determined using single population proportion formula by taking into account 95% of CI, margin of error (d)(0.050) and Proportion (P) of adherence (41%) taken from a study done in southern Ethiopia, among pregnant women of Arbaminch town(26).

$Z_{\alpha/2}$ = corresponding Z score of 95% CI, d = margin of error

Therefore, the final sample size was;

$$n = \frac{(Z_{\alpha/2})^2 \times P(1-P)}{d^2} = \frac{(1.96)^2 \times 0.41(1-0.41)}{(0.05)^2} = 372$$

By adding 10% non-response rate the final sample size was 410 mothers.

The sample size determination for the second objective calculated by EPI Info was 302 PNC mothers which calculated from three independent variables of previous study done in Arba Minch town(26). Therefore, by comparing the sample size for the first and second objectives, the final sample size for this study was 410 mothers.

Table 1. Sample size Calculation for study conducted on adherence to eight antenatal care contact and its associated factors among postnatal mothers Sululta district public health institutions, 2024.

S.no	Factors associated with adherence to eight antenatal care model(26)	Assumptions					Sample Size	10 % nonresponse rate	Final Sample size
		CI	Power	Ratio	Prevalence of exposed group	Prevalence of unexposed group			
1.	Bad obstetric history	95%	80%	1	59.1%	31.7%	114	11.4	126
2.	Pregnancy danger signs	95%	80%	1	71.1%	32.6%	62	6.2	69
3.	Partner involvement	95%	80%	1	60%	42.4%	274	27.4	302

4.6.Sampling procedure

Systematic random sampling technique was used to select study participants, from 4 health centers and 1 primary hospital,

This study was conducted at 1 primary hospital and 4 health centers found in Sululta woreda. The sample was proportionally shared to health facilities (138 from Chanco primary hospital and 91, 69, 50, and 62, postpartum women from Chanco, Gorfo, Derba, and Duber health centers, respectively), based on the basis of their client flow from their reports of previous year of three consecutive months, (270 Chanco primary hospital and 178, 134, 97, and 121 at Chanco, Gorfo, Derba, and Duber health centers, respectively. Sample size was calculated according to their admission as in above, then systematic sampling technique was employed to recruit study participants by calculating K value= $802/410$ ($K=2$). Finally, study participants were selected by the skipping interval “2” and the first study participant was select by lottery method from the first two women.

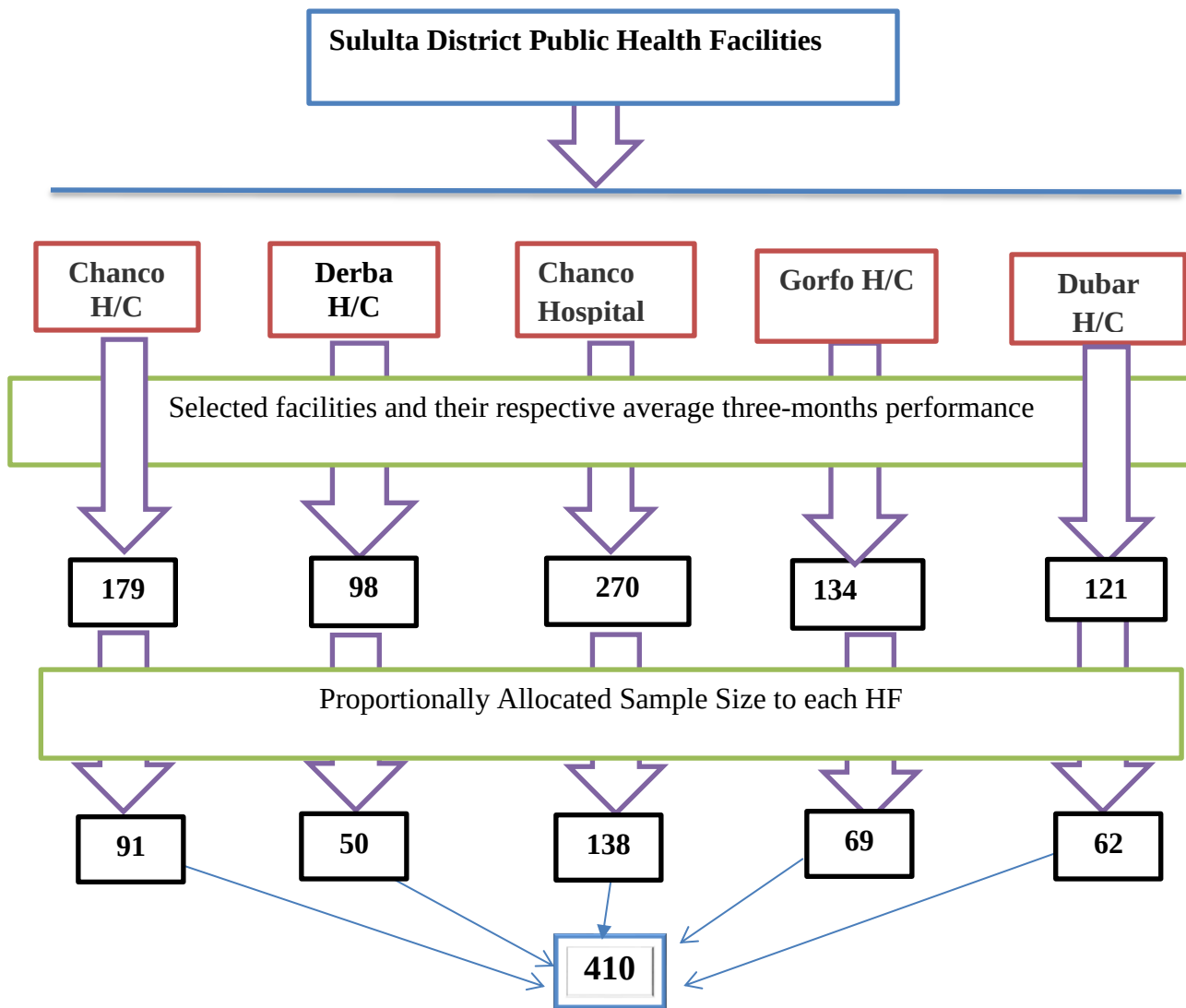


Figure 2: Schematic presentation of the sampling procedure for the study on Adherence to Eight Antenatal Care Model and Associated Factors among postpartum at sululta district north Shewa Oromia: Ethiopia 2024.

4.7.Variable of the Study

4.7.1. Dependent variable

- Adherence to ANC 8⁺ model

4.7.2. Independent variables

- **Socio-demographic variables:** age, sex, marital status, educational status and occupation
- **Obstetrics Related Factors:** Parity, history of abortion, Wanted pregnancy, previous Mode of Delivery, History of Obstetric complications
- **Health Care Related Factors:** waiting time during ANC, distance from health facility, cleans of health facility
- **Knowledge related factors:** information about danger signs, knowledge regarding timing of ANC,
- **Partner support related factors**
- **Maternal decision-making ability related factors**
- **Maternal service satisfaction related factors**

4.8. Operational Definition

Adherence to ANC: Those women who start first antenatal care during first trimester, attend eight, and above ANC contact in recommended time. Those women who delivered before eight contacts after 38 weeks of gestational age while attending the recommended time regularly, was considered as adhered to the new 8+ ANC and it were recorded as 8+ contact during data collection(15).

Non adherence to ANC: Those women who start ANC after 12 weeks of gestation and failed to attended ANC contact at the recommended schedule were considered as non-adhere (15).

Knowledge of ANC: A scoring system was used for assessing the knowledge of the respondents by awarding marks on the basis of their response to a question that gave them 10 options to choose from, every correct response was awarded a maximum of 1 mark, whereas an incorrect response attracted 0 marks. The total asked questions were 10. The total scores obtained were graded into poor, fair, and good knowledge. If the respondents answered 1 to 4 questions correctly of 10, it considered as poor knowledge, 5 to 7 correct answers represented fair knowledge, and 8 to 10 correct answers meant good knowledge(56).

Distance from the facility: long distance was defined as taking more than one hour to reach the health facility and short distance was defined as taking less than half an hour((15).

Waiting time: a long waiting time was defined as waiting for services for >30 min and not long if receiving services within 30 min(26).

Mothers' decision making: Three options were given regarding decision making process decide by them self; decide with their partner and decide only by their partners. From these options mothers those participate during decision making process, that means those responded “decide with them self and decide with their partner” were considered to be autonomous and those responded “only by their partner” were considered as not autonomous.

Maternal satisfaction: The degree of satisfaction was measured by selecting a response ranging from 1(strongly disagree), 2(disagree), 3 (neutral), 4 (agree) to 5 (strongly agree). Total of eight questions were asked to measure satisfaction having a maximum of 40 scores and minimum of 8 scores. Women those scored 75% and above in the satisfaction measuring items were categorized as satisfied and those who scored less than 75% as not satisfied(52).

Partner support: partner support was assessed using eight-item Spousal Support Scale (SSS) that was customized based on the local context. SSS scores were in the range of 8–48, and reverse scoring was used (5 = strongly agree to 1 = strongly disagree). A respondent scoring higher than the mean value were considered as supported by partner.

4.9. Data collection tools and procedures

Data collection tool was developed by reviewing different literature and guidelines ((1)(26),(23) and data was collected using a structured, interviewer administered questionnaire through face-to-face interviews supplemented with patient folder review. Since the interview was conducted at immediate post-partum care, the patient card was available in post-partum unit. Therefore, some important data like the detail of each ANC contact with their GA was recorded. The questionnaire contains socio demographic related factors, Obstetrics Related Factors, Health Care Related Factors, knowledge towards ANC, partner support related factors, maternal decision making power and maternal satisfaction related factors. Five BSc midwives for data collection and one senior BSc midwives for supervision was trained at common place, about the interview technique, and how to collect and supervise the data respectively. Data was collected from the women directly at post-natal care service after 8 hours of rest after delivery until discharge from facility.

4.10.Data quality control

Initially, the questionnaire was prepared in English and translated to Afaan Oromo and back to English by language experts with the help of health professionals to ensure its consistency and better understandability. Two days training was given on how to collect the data, the way of approach to the study participants, interview technique, and how to keep information. Just A week before the actual data collection, a pretest was conducted on mothers at postnatal care in Muka Turi hospital on 5% (21) of the sample size to check response, language clarity, and appropriateness of the questionnaire. Thereafter, amendments were done accordingly. Order rearrangements was done and ambiguity words were replaced. During the actual data collection, the questionnaire was checked for completeness daily by the supervisors.

4.11.Data processing and analysis

The data were collected using Kobo Toolbox and exported to Statistical Package for Social Science (SPSS) Version 25 for, cleaning, checking coding and analysis. Descriptive statistics like percentages and frequency were stated using tables and graphs to present the characteristics of study participants. The binary logistic regression model was fitted to identify risk factors for pregnant women to use the ANC 8 recommendations. To find the potential explanatory factors for the multivariable analysis, bivariable analysis was first performed. During bivariable analysis variables having a p-value of ≤ 0.25 were included in the multivariable logistic regression analysis to handle the effect of possible confounders and to identify independent factors affecting adherence to the ANC8+. Model fitness was checked using Hosmer and Lemeshow goodness of fit which was .157 and not significant and VIF was checked and was not greater than 10. Then, the level of significance was declared based on a 95% CI at a p-value of ≤ 0.05 .

4.12.Ethical Consideration

Ethical clearance was obtained from the Institutional Ethical Review Board of Arsi University college of health science. Approval to conduct the study was obtained from the local authorities at the Sululta district Health Bureau and Informed consent was obtained from the study participants and they were assured that the documented personal information would be confidentially kept.

4.13.Dissemination of Result

The study was prepared in hard and soft copy and submitted to Arsi University college of health science department of Midwifery. The plan for dissemination of the project result includes presentation at Arsi University, and different conferences. The report paper will also be disseminated to sululta district Health Bureau, and other interested governmental and nongovernmental organizations. Publication in scientific journals and online dissemination will be sought.

5. Results

5.1.Socio-demographic characteristics of mothers

A total of 410 women fully responded to the interview questionnaire making a response rate of 100%. The mean age of mothers was 26.67 with the standard deviation of 5.677, From study participants 133(32.4%) of mothers were 25-29 age groups, 263 (64.1%) were urban by residence, 394 (96.1%) of them were married. Of the study participants, 160 (39.0%) of them completed at least primary school, slightly more than half (58.5%) of them were housewife. The mean family monthly income of respondents was 7890 ETB, and 141 (34.4%) of the mothers were from those families' monthly incomes between 1500 and 5000 ETB.

Table 2 Socio demographic characteristics mothers admitted to postpartum unit at public health facilities sululta district 2024.

Variables	Categories	Frequency	Percent
Age of mothers	15- 19	63	15.4%
	20-24	93	22.6%
	25-29	133	32.4%
	30-35	72	17.6%
	35 and above	49	12.%
Residence	Urban	263	64.1%
	Rural	147	35.9%
Marital status	Married	394	96.1%
	Single	6	1.5%
	Divorced	7	1.7%
	Widowed	3	0.7%
Mothers level of education	Unable to read and write	88	21.5%
	Primary school	160	39.0%
	Secondary school	87	21.2%
	College and above	75	18.3%
Moher's' occupation	Hose wife	240	58.5%
	Government employ	65	15.9%

	Merchant	72	17.6%
	NGO	14	3.4%
	Others	19	4.6%
Husbands' level of education	Unable to read and write	48	12.2%
	Primary school	123	31.2%
	Secondary school	82	20.0%
	College and above	141	35.7%
Husbands' occupation	Farmer	112	27.3%
	Government Employ	88	21.5%
	Daily Laborer	71	17.3%
	Merchant	84	20.5%
	Ngo	41	10.0%
Family monthly income	<1500	25	6.1%
	1500-5000	141	34.4%
	5001-10000	113	27.6%
	>10000	131	32.0%
Family size	<3	48	11.7%
	3-5	271	66.1%
	>5	91	22.2%

Others: Daily laborer, student, private

5.2. Obstetric characteristics of mothers

Among post-partum women in public health facilities of Sululta district during the study period; 293(71.2%) of mothers were multi parous, 349 (85.1%) of mothers get pregnant with a plan, From the study participants of multi gravida women 91(22.2%) of them had history of abortion and 28(6.6%) of them faced neonatal or child loss.

Findings regarding to previous mode of delivery 202(75.7%) of mothers gave birth through spontaneous vaginal delivery, 108(40.4%) mothers faced at least one type of obstetric complication during their previous pregnancy and delivery, from this 38(35.2%) of them face leakage of fluid per vagina before onset of labour. From mothers participated in this study 202(62.7%) of them discontinued form schedules for different reasons. And 151(36.8%) of women started their first ANC contact at or before 12weeks of gestation.

Table 3 Obstetric characteristics of mothers admitted to postpartum unit at public health facilities sululta district 2024.

Variables	Categories	Frequency	%
Number of pregnancies	Primigravida	117	28.8%
	Multi gravida	293	71.2%
Number of births	Primipara	143	34.6%
	Multi para	267	65.4%
Planned pregnancy	Yes	349	85.1%
	No	61	14.9%
History of abortion	Yes	91	22.2%
	No	202	77.8%
Type of abortion	Spontaneous	69	75.8%
	Induced	22	24.2%
Number of abortions	1	80	87.9%
	2	8	8.8%
	3	3	3.3%
Previous mode of delivery	SVD	202	75.7%
	Cesarean section	56	21.0%
	Instrumental	9	3.3%

Number of alive children do you have	1	145	35.4%
	2-5	246	60%
	>5	19	4.6%
History of child loss	Yes	28	6.6%
	No	239	94.4%
First ANC contact up to 12wks	Yes	151	36.8%
	No	259	63.2%
Eighth ANC contact 39-42wks	Yes	238	58%
	No	172	42%
Gestational weeks at first contact	At first trimester	151	36.8%
	At second trimester	242	59.1%
	At third trimester	17	4.1%
Reason for lost from recommended ANC	Not registered	16	5.0%
	Discontinuation	202	62.7%
	Late initiation	104	32.3%
Reason for discontinuation	I feel health	90	44.6%
	They didn't tell me when to come back	32	15.8%
	Being busy	46	22.8%
	Due to distance	27	13.4%
	Others	7	3.5%
History of obstetric complication	Yes	108	40.4%
	No	160	59.6%
Types of complications	Hypertension during pregnancy	32	29.6%
	Excessive vomiting	17	15.7%
	Vaginal bleeding	16	14.8%
	Leakage of fluid per vagina	38	35.2%
	Others	5	4.6%

Others: Social problems, health status, not satisfied with the service.

Others (complications): preterm labour, perineal tear and obstructed

5.3. Personal characteristics of mothers

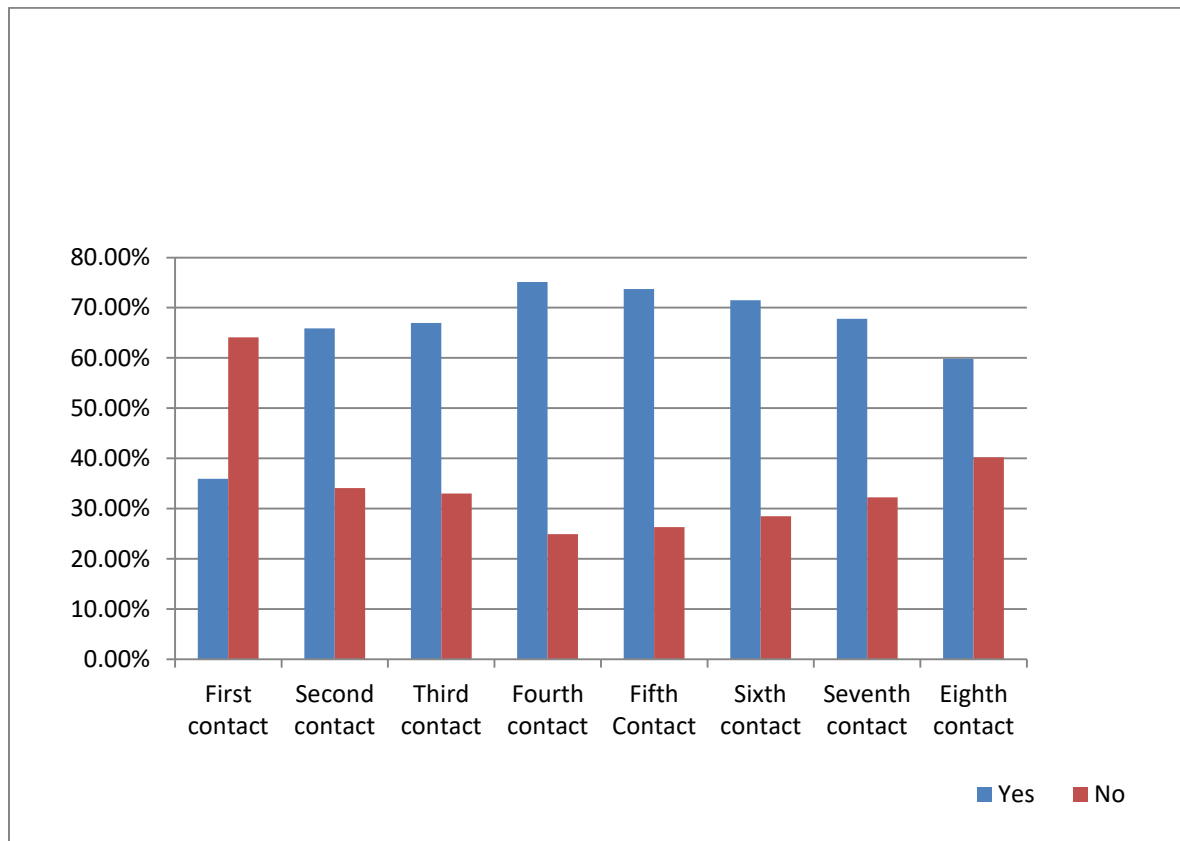
From study participants 316 (77.1%) of mothers had good knowledgeable regarding ANC, 289(70.1%) mothers were satisfied with the service they received during antenatal care, 361(88%) of them were supported by their partner and 380(92.7%) of them were autonomous.

Table 4 Personal characteristics of post-partum mothers at public health facilities of sululta district 2024.

Variables	Categories	Frequencies	%
Mothers' knowledge	Poor	29	7.1%
	Fair	65	15.8%
	Good	316	77.1%
Mothes satisfaction	satisfied	289	70.1%
	not satisfied	121	29.6%
Partner support	Supported	361	88%
	Not supported	49	12%
Decision making ability	Autonomous	380	92.7%
	Not autonomous	30	7.3%

According to their ANC utilization compared to gestational weeks; 36.8% of mothers involved in this investigation visited health facility before passing 12 weeks of gestation and majority of respondents 75.1% of them visited health facility between 27-30 weeks and 59.8% of mothers visited health facility between 39-42 weeks.

Figure 3. Level of Antenatal care utilization at the recommended contact at public health facilities of sululta district 2024.



5.4. Health facility related factors

From study participants, 118 (28.8%) of them could not find health facilities around them, around three fourth of mothers (74.4%) reached health facility within 30 minutes and, 201(49%) of them walked on foot to the health facility for ANC service. Majority of mothers (69.1%) visited public health facilities for ANC get service within 30 minutes and 272(66.3%) of women got ANC service at health centre.

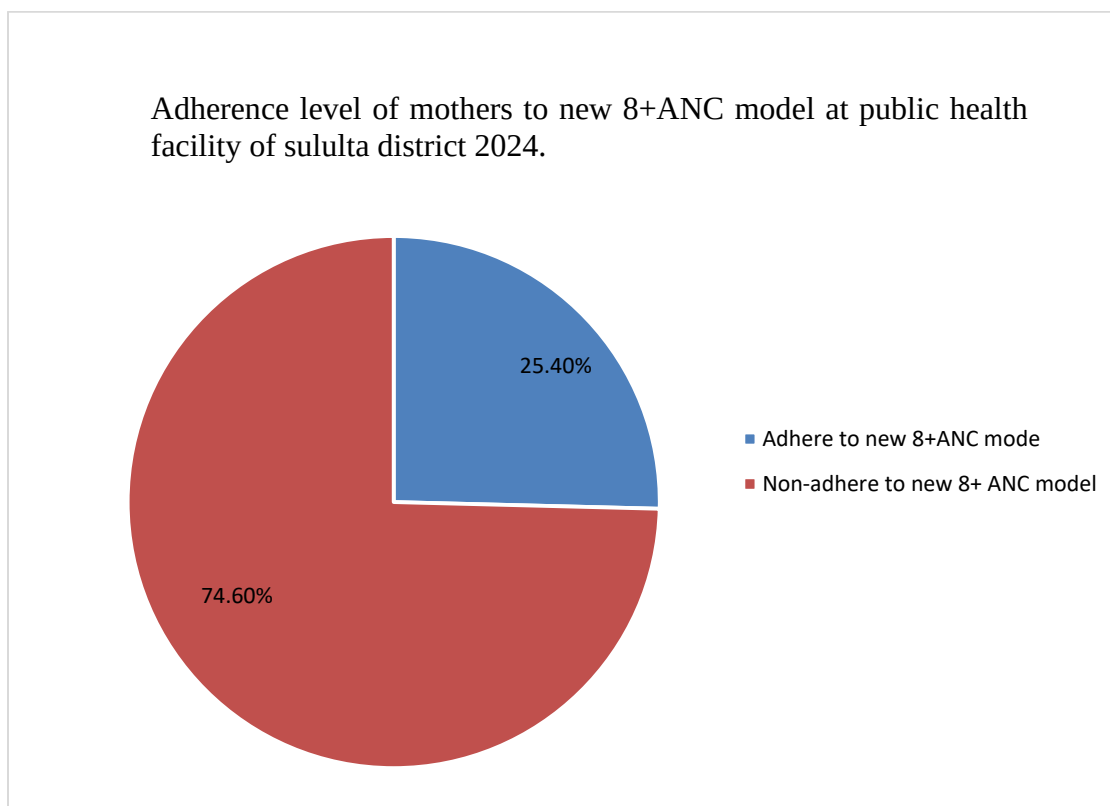
Table 5 Health facility related response of mothers admitted to postpartum unit at public health facilities sululta district related to health facilities 2024.

Variables	Categories	Frequency	Percent
Nearby health facility	Yes	292	71.2%
	No	118	28.8%
Distance from health facility	<30 minutes	305	74.4%
	30-60 minutes	66	16.1%
	>60 minutes	39	9.5%
Ways of transportation	On foot	201	49.0%
	By public transport	166	40.5%
	By horse or mule	43	10.5%
Waiting time until getting service	<30	284	69.3%
	>30	126	30.7%
Type of health facility for ANC service	Health center	272	66.3%
	Hospital	138	33.7%
Were you asked for Payment for service?	Yes	67	16.3%%
	No	343	83.7%%
Amount of payment	<300	50	74.6%%
	>300	17	25.4%%

5.5.Level of adherence to new 8 antenatal care model

The overall level of adherence to new 8 eight antenatal care model during this investigation was 104 (25.4%) (95% CI: 21% ,30%).

Figure 4.Adherence level of post-partum mothers to new the new 8+ ANC model at public health facility of sululta district 2024.



5.6.Factors associated with adherence to new 8 antenatal care model

During bivariable logistic regression analysis; Age groups of mothers, residence, educational level of mothers, educational level of husbands, occupational status of husbands, pregnancy was planned or not, previous mode of delivery, history of obstetric complication, type of health facility for this ANC contact, knowledge level of mothers, and maternal satisfaction were a candidate for multi variable logistic regression model to identify variables those significantly associated with adherence level to new 8+ antenatal care model.

Analysis of multivariable logistic regression shows that; previous mode of delivery, history of obstetric complication, type of health facility for ANC contact, mothers' satisfaction and residence of mother were significantly associated with the adherence to the new 8 antenatal care model.

The odds of adhering to the new eight or more ANC model among mothers who previously gave birth by cesarean section were 3.3 folds high as compared to those mothers who gave birth through spontaneous vaginal delivery (AOR: 3.329, 95%CI:1.390, 7.974).

Mothers who previously faced at least one type of obstetric complication were 6 times more likely to adhere to the new 8 antenatal care compared to mothers who previously had not faced any type of obstetric complication (AOR:6.162, 95%CI:2.693, 14.099). The likelihood of adhering to the new 8+ ANC model among those mothers satisfied with antenatal care service was 6.7 times increased than mothers not satisfied with antenatal care service (AOR: 6.775, 95%CI:2.460, 18.657).

Another factor that affects adhering to the new 8+ ANC model during this investigation was the type of health facility they were receiving antenatal care service. Mothers who received antenatal care at health centers were 2.9 times more likely to adhere to the new 8+ ANC model than those mothers whose antenatal care services were at the hospital (AOR:2.945, 95%CI:1.242, 6.928). In another way, mothers who live in urban areas had 3 times a chance of adhering to the new 8+ ANC model than who live in rural areas (AOR:3.060, 95%CI:1.166, 8.034).

Table 6. Binary and multi variable logistic regression analysis for adherence to new 8 ANC model among post-partum mothers at public health facilities of sululta district 2024.

Variables	Adherence to 8 antenatal care model		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age groups				
15-20	22(34.3%)	42(65.7%)	3.220(1.241, 8.351)	3.787(.583, 24.585)
20-24	20(21.7%)	72(78>3%)	1.667(.650, 4.271)	.767(.192, 3.073)
25-29	39(29.3%)	94(70.7%)	2.489(1.029, 6.019)	1.295(.417, 4.019)
30-35	16(22.2%)	56(77.8%)	1.714(.647, 4.541)	1.092(.327, 3.647)
35 and above	7(14.3%)	42(85.7%)	.1	1
Residence of mothers				
Urban	82(31%)	181(69%)	2.574(1.526, 4.342)	3.060(1.166, 8.034) *
Rural	22(15%)	125(85%)	1	1
Mothers level of education				
Unable to read and write	10(11.3%)	78(88.7%)	1	1
Primary school	42(26.2%)	118(73.8%)	2.776(1.136,5.857)	.950(.288, 3.138)
Secondary school	29(33.3%)	58(66.7%)	3.900(1,761, 8.637)	2.405(.516, 11.205)
College and above	23(30.6%)	52(69.4%)	3.450(1.518, 7.842)	1.102(.200, 6.060)
Husband’s level of education				

Unable to read and write	5	44	.203(.076, .544)	.270(.034, 2.138)
Primary school	30	95	.565(.332, .962)	.967(.235, 3.980)
Secondary school	16	66	.434(.228,.825)	.523(.152, 1.800)
College and above	52	93	1	1
husband's occupation				
Farmer	16	96	1	1
Government employ	28	60	2.800(1.399, 5.604)	.787(.167, 3.716)
Daily laborer	16	55	1.745(.810, 3.763)	.553(.128, 2.385)
Merchant	28	56	3.000(1.494, 1.494)	.755(2.01, 2.836)
NGO	14	27	3.111(1.350,7.169)	1.199(.267, 5.397)
Planned pregnancy				
No	7(11.5%)	54(88.5%)	1	1
Yes	97(37.8%)	252(62.2%)	2.969(1.306, 6.752)	1.519(.532, 4.333)
Previous mode of delivery				
SVD	45(23.4%)	166(76.6%)	1	1
Caesarean section	26(49%)	30(51%)	3.197(1.720,5.943)	3.329(1.390, 7.974) **
Previous obstetric complication				
No	29(18.2%)	130(81.8%)	1	1
Yes	42(38.9%)	66(61.1%)	2.853(1.632, 4.986)	6.162(2.693,14.099) ****
Type of health facility				

Health centre	78(28.7%)	194(71.3%)	1.732(1.049,2.859)	2.945(1.242, 6.928) *
Hospital	26(17.5%)	122(82.5%)	1	1
Mothers' satisfaction				
Not satisfied	16(13.2%)	105(86.8%)	1	1
Satisfied	88(30.4%)	201(69.6%)	2.873(1.604, 5.145)	6.775(2.460, 18.657) ***
Mothers' knowledge				
Poor knowledge	6(20.7%)	23(79.3%)	.635(.250, 1.611)	.197(.023, 1.728)
Fair knowledge	6(9.2%)	59(90.8%)	.248(.103, .594)	.221(.064, .767)
Good knowledge	92(29.1%)	224(70.9%)	1	1

COR - Crude odds Ratio, AOR - Adjusted Odds Ratio, CI: confidence interval. * P- Value < 0.05, ** P- Value < 0.001, 1 reference, ***p-value<0.0001

6. Discussion

The aim of this study was to determine the adherence level of mothers to the new ANC 8+ model and enabling factors among post-partum women at public health facilities of sululta district. The overall level of adherence to the new 8+ ANC model during this investigation was 25.4%. This is slightly similar with the study conducted in Uganda which was 23.4%(31). This finding is high when compared with the study conducted in Bangladesh which was only 6%(19), research investigated in Cameroon(9%)(22), the study conducted in Nigeria 17.4%(21) and the study conducted in Ethiopia only 3%(12). This difference might be due to the difference of health policy of countries, access to information on updated ANC model and health-seeking behavior and methodologies applied to conduct these studies.

The level of adherence to the new 8+ANC in Sululta district was low when compared to the study conducted in Ghana (41.9%)(20), (this discrepancy might be due to deference maternal and child health policy, socio cultural and economic status), and southern parts of Ethiopia Arbaminch town (41%)(26). This disparity could be the result of different awareness levels of mothers to new 8+ ANC and the commitments of stakeholders on implementing the new 8+ ANC model.

The finding of this study demonstrated that the odds of adhering to the new 8+ antenatal care model was increased by 3.3 times for those mothers previously given birth by cesarean section compared to those mothers given birth previously through vaginal delivery. This finding is supported by the study conducted in Ethiopia in 2019, which shows that mother's optimal utilization of 8+ ANC was increased by 18% than those who delivered through spontaneous vaginal delivery(12). Due to increasing chance of complication on subsequent pregnancy, health care providers increased focus on counseling and raising awareness for the next pregnancy during procedure and discharge from health facilities for mothers who given birth by cesarean section, and mothers' concerns about whether the scar can affect their pregnancy, can lead to this increasing chance of mothers those previously given birth through cesarean section to more adhere to the new 8+ ANC than their counterparts.

Obstetric complication was also another factor associated with adherence level of mothers to new 8+ANC. Mothers those face complication during their previous pregnancy or delivery were 6 folds to adhere to the new 8+ ANC model when compared to those their previous pregnancy

and delivery were normal. This is supported by the study conducted in southern Ethiopia Arbaminch town(26). This may be the fact that the chances of recurrence of most obstetric complications are high, for this reason, women with a history of obstetric complications may even need follow-up from pre-conception, delivery and post-partum. These reasons may force women with previous complications to early initiate and more frequent antenatal care than the regular contacts, which in turn increases the chance of attending all the recommended contacts.

This current investigation also found that adherence of mothers to new 8 ANC model was related to their place of residence. Mothers those live in urban residence were 3 times more likely to adhere to the new 8+ antenatal care model than those mothers live in rural areas. This is supported by the study conducted in Gondar on women intention to use to 8+ANC(15) and the study which was done in Nigeria(21). Lack of education and knowledge; lower educational levels hinder knowledge about ANC benefits and services resulting in delayed initiation and fewer contacts. Long distances to health facilities may also pose logistic challenges, further discouraging pregnant women from regular attendance. Limited financial resources may also affect the rural area mothers to attend ANC at the recommended schedule, for these and different reasons mothers from rural residences are affected to late start to ANC service as well as high discontinuation rate from regular schedules.

This study revealed that the odds of adhering to the new 8+ antenatal care model was positively associated with mothers' satisfaction during antenatal care service utilization, hence those mothers more satisfied with antenatal care service were 6.7 times more likely to adhere to the new 8+ ANC model compared to those were not satisfied with antenatal care service; This finding is supported by study conducted in Borema, Somaliland. The possible explanation for this deference is the fact that mothers those previously not satisfied in the quality of care, treated disrespectfully, and had to wait a long time to get service are not willing to return for the next contact. Due to limited numbers of similar studies, there was no study that support or oppose this finding.

The adherence level of postpartum mothers was also corelated with the type of health facility they use for antenatal care service. According to this finding mother those received their current antenatal care service at health center were 2.9 times more probable to adhere to the new 8+ antenatal care than those received antenatal care service at hospital. This finding was

contradicted to the study conducted in Ethiopia Arbaminch town(26). The increasing patient load at hospital visits can leads mothers to wait long time to get service and the availability of ultrasound in health centers and accessibility of health centers in rural areas may increase the interests of women to attain antenatal care more frequently at health centers.

7. Strength and limitations

7.1.Strength

Although the data used for this study was self-report, mothers medical record cards were examined concurrently with the interview to reduce recall bias.

7.2.Limitations

The findings of this investigation may be affected by social desirability bias as the interview was held in the health facilities, which can influence the mothers to give more favorable and accurate responses than they would have been in another environment. Since this study was conducted by cross sectional design the study cannot establish a causal relationship between the outcome and identified exposures.

8. Conclusion and recommendations

8.1. Conclusion

The adherence level of mothers to the new 8+ ANC model among post-partum women at public health facilities of sululta district is low. Previous mode of delivery, history of obstetric complication, type of health facility for ANC contact, mothers' satisfaction, and residence of the mother were significantly associated with adherence level of mothers to the new 8 ANC model.

8.2. Recommendation

➤ Health care providers of sululta districts should

- Counsel all pregnant women attending antenatal care service on the benefits of attending all recommended 8+ ANC contacts during each contact, particularly those from rural residents, to minimize discontinuation and improve adherence to the new 8+ ANC model.
- Treat pregnant women with compassion, respectful and friendly to increase women satisfaction.
- Counsel all post-partum mothers regardless of mode of delivery and their status during delivery to early start antenatal care service for the next pregnancy and to attained recommended schedules, therefore early initiation by its self can increase adherence level to the new 8+ antenatal care service.

➤ Sululta district health office should

- Arrange enabling factors that increase women satisfaction to early initiate ANC service and to complete the recommended contacts. This can be achieved through availing laboratory service, ultrasound and minimizing long waiting's.
- Implement community-level campaigns by collaborating with health extension workers and community leaders, to raise awareness about the benefits of the WHO 8+ antenatal care service especially in rural areas to promote increasing utilization of recommended contacts for those women in remote areas.

➤ Other researchers should

- Conduct similar studies by using different methodologies like cohort studies to identify the underlying cause and effects of low adherence of mothers to new 8+ ANC model.

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10.ANNEXES

Annex 1. English version questionnaire and Consent Form

Arsi University Asella Teaching Referral Hospital Department of Midwifery

Participant information sheet and consent form

Good morning/afternoon dear participant! My name is _____, I am working as a data collector for the study being conducted in Sululta district/kebele on title “Adherence to eight antenatal care contact and associated factors among postpartum mothers at public health facility of sululta district, north Shewa Zone, Oromia region, Ethiopia, 2024. Facility based cross sectional study design by Anane Mulatu, who is a candidate of MSc (Graduate Class) in University Arsi, Asella Teaching and Referral Hospital Department of Midwifery. The finding of this study is going to feed into plan of stakeholders working on how best to strengthen and improve child health services in the district especially related to Adherence to eight antenatal care contact among postpartum mothers during PNC period. The information that will be obtained using this interview will be used only for research purpose. The confidentiality and anonymity is fully assured, as your name is not required and only the researcher will have access the results. It will not affect you in anyway, should you?

Declaration of informed voluntary consent form for the participant

I have been informed that the purpose of this study is assessing Adherence to eight antenatal care contact and associated factors among postpartum mothers at public health facility of sululta district. I have understood that participation in this study is entirely voluntarily. I have been told that my answer to the question will not be given to anyone else and not reports of this study identify me in any way. I understood that participation in this study does not involve risks.

Participant’s signature _____ Date _____

Interviewer’s name _____ Signature _____

Address of principal investigator: Tell: 0917352819 e-mail: -mimyeabdi4@gmail.com

Annex 2. English version questionnaire

Section I Socio-demographic characteristics

S.N	Questions (variable description)	Response		skip
101	Age of mother	_____years		
102	Residence	1. Urban 2. Rural		
103	Marital status	1. Single 2. Married	3. Divorced 4. Widowed	
104	Educational level	1. unable to read and write 2. Primary 3. Secondary	4. Preparatory 5. Diploma and above	
105	Your occupation?	1. House wife 2. Merchant	3. Gov't employee 4. Others	
106	If married, education level of your husband?	1. unable to read and write 2. Primary 3. Secondary	4. Preparatory 5. Diploma and above	
107	If married, your husband occupation?	1. Farmer 2. Merchant	3. Daily laborer 4. Gov't employee 5. NGO	
108	Family size	_____		
109	Family monthly income	_____		

Section II :- Obstetric history Part

S.N	Questions (variable description)	Response	Skip
203	Number of pregnancies	_____	
204	Number of Births?	_____	
205	Was this pregnancy was planned?	1. Yes 2. No	
206	Do you have history of abortion?	1. Yes 2. No	
207	Number of abortion	_____	
208	Type of abortion	1. Induced 2. Spontaneous	
209	Number of alive children do you have	_____	
210	Do you have history of neonatal or child loss?	1. Yes 2. No	
211	Previous mode of delivery	1.SVD 2. Instrumental 3. caesarean section	
211	History of obstetric complication, (only for multiparous)	1. Yes 2. No	
212	If yes, what type of complications you face?	1. Vaginal bleeding 2. Excessive vomiting 3. Severe headache 4. Linkage of fluid per vagina 5. Others specify _____	
213	How many times did you visit health facility for ANC follow up for this pregnancy?	_____	
214	How many weeks was your pregnancy during your first ANC contact?	_____	
215	From pt. card (recommended contacts)		

	1st visit (up to 12wks)	1.Yes 2. No	
	2nd visit (13-20 wks.)	1.Yes 2. No	
	3rd visit (21wks -26 wks.)	1.Yes 2. No	
	4th visit (27 wks-30 wks.)	1.Yes 2. No	
	5th visit (31wks-34 wks.)	1.Yes 2. No	
	6th visit (35 wks-36 wks.)	1.Yes 2. No	
	7th visit (37wks-38 wks.)	1.Yes 2. No	
	8th visit (39 wks-40 wks.)	1.Yes 2.No	
216	If there is any lost recommended contact from 215, why?	1. Not registered 2. Discontinuation of follow up	
217	If discontinuation, why?	1. They don't tell me when to come back 2. I feel health 3. Due to distances 4. Being busy 5. The services was not attracting 6. Other specify____	

Section III: Knowledge related factors

501	Do you know women need to start ANC services before 3 months?	1. Yes 2. No	
502	Do the pregnant with high blood pressure affect the fetus growth?	1. Yes 2. No	
503	Does counseling on danger signs during pregnancy helps you to seek timely antenatal care?	1. Yes 2. No	
504	Does the pregnant woman need to test for HIV?	1. Yes 2. No	
505	Does the pregnant women need to blood screen for Hgb?	1. Yes 2. 2.No	
506	Does the pregnant woman need to vaccinate for TT	1. Yes 2. No	
507	Is you think pregnant women need iron tablet?	1. Yes 2. No	
508	Does the pregnant woman need to be taken ant parasitic drugs during pregnancy?	1. yes 2. No	
509	Antenatal follow up helps pregnant women to identify complications in pregnancy?	1. yes 2. No	
510	Health facility delivery is safer and better than home delivery?	1. yes 2. No	

	Mothers' satisfaction with antenatal care service-related questions	response				
	Items	5.Strongly agree	4.Agree	3.No opinion	2.Disagree	1.Stongly disagree
701	How would you rate your interaction health care provider?					
702	Did you feel comfortable and respected during your contact?					
703	Were the service easily accessible when needed (like lab, ultrasound--)?					
704	Did you feel adequately informed about your care and pregnancy?					
705	Did you feel comfort with the cleanliness of the service area during your antenatal care service?					
706	How satisfied are you with the time taken to receive care?					
707	How satisfied were you with the privacy during consultation or examination?					
708	Would you recommend your friends or relatives for antenatal care service to this service area?					

Section Health facility related questions

S.N	Question (variable description)	Response	Skip
401	Is there health facility nearby?	1. Yes 2. No	
402	Distance from your home to health facility	_____minutes	
	Ways of transportation	1. On foot 2. Hoarse or mule 3. Public transport	
403	Is there any payment you asked for check-up?	1. Yes 2. No	
404	If you paid for any service charge what is the maximum money you paid for a visit	_____ ETB	
405	Waiting time	_____ minutes	

Mothers Decision making related questions				
	Items	3.Respondent herself	2.Respondent and husband jointly	1.Husband only
091	Who usually decides how to spend the income that you bring into the household?			
092	Who usually decides how to spend the income that your partner brings into the household?			
093	Who usually decides about making smaller purchases, such as food and other less expensive needs?			
094	Who usually decides about making more expensive purchases, such as household equipment?			
095	Who usually decides on which family members you will visit and when?			
095	Who decides how many children you will have?			
096	Who usually decides whether your child will be taken for health care to a health facility when s/he is sick?			

097	Who usually decides on use any types of contraception, such as condoms or pills?			
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	Partner support					
	Items	5.Strongly agree	4.Agree	3.No opinion	2.Disagree	1.Stongly disagree
051	I feel good about the amount of involvement my spouse has with my children.					
052	I am happy about the amount of interest that my spouse has shown in the children					
053	I am pleased with the amount of responsibility my spouse has taken for raising the children					
054	I am satisfied with my spouse's childbearing skills					
055	I am satisfied with the amount of time that my spouse can give to my children.					
056	My spouse usually does not help enough with the children					
057	My spouse thinks parenthood is an important and valuable part of life which pleases me greatly					
058	My spouse has sufficient knowledge about child development which seems to make him/her feel comfortable as a parent.					

Thank you for your information!

Annex 3. Gaaffii afan oromootti hiikame

Yuunivarsiitii Arsii Hospitaala Rifaralaa Barsiisaa Asellaa Kutaa muummee Midwifery

Waraqaa odeeffannoo hirmaataa fi unka hayyamaa

Nagaa ganama/waaree kabajamaa hirmaataa! Maqaan koo _____ jedhama, qorannoo aanaa Sulultaatti hordoffii da'umsa duraa yeroo saddetif isa oli irratti gaggeeffamaa jiruuf raga sassabun dhufe, Bu'aan qorannoo kanaa karoora qooda fudhattoonni tajaajila fayyaa daa'immanii fi haadhoolii akkamitti akka gaariitti cimsuu fi fooyyessuu danda'an irratti aanaa kana keessatti hojjetan gabbisuf keessumaa yeroo da'umsa boodaa gidduutti hordoffii kunuunsa dahumsa duraa saddeet hordofuu wajjin walqabataa. Qorannoon kun dhiibbaa tokko illee sirraan hin ga'u. kanaaf gaaffiiwwan muraasan isin gaafadha, yeroo keessan xiqqoo isin jalaa fudhuu laata?. Maqaan keessan hin barraa'u, akkasumas icciitiin raga isin kennitanii ni eegama.yeroo hanga daqiiqaa 30 nutti fudhata. Yeroo hin barbaannetti gaaffii kiyya kana adda kutuuf mirga guutuu ni qabda. kanaaf gaaffii isin gaafadhu kana irratti akka hirmaattan kabajaan isin gaafadha.

Hirmaataaf unka hayyamama ta'uu odeeffannoo qabu labsu

Kaayyoon qorannoo kanaa haadholii da'umsa boodaa dhaabbata fayyaa hawaasaa aanaa suluultaatti argamu keessatti qunnamtii kunuunsa dahumsa duraa saddeet fi wantoota kanaan walqabatan madaaluu akka ta'e naaf himameera. Qorannoon kun hirmaannaan guutummaatti fedhii kootiin akka ta'e hubadheera. Deebiin ani gaaffilee kanaaf kennu nama biraatiif akka hin kennamnee fi gabaasa qorannoo karaa kamiinuu eenyummaa koo akka na hin baafne natti himame. Qorannoon kun hirmaannaan balaa akka hin qabne argadheera.

Mallattoo hirmaataa _____ Guyyaa _____ .

Maqaa gaafataa _____ Mallattoo _____ .

Teessoo qorataa ijoo: lakk bilbil : 0917352819 e-mail:-mimyeabdi4@gmail.com

Kutaa I Amaloota hawaas-dimoogiraafii

S.N	Gaaffiiwwan	Deebii		skip
101	Umurii haadhaa	_____waggaa		
102	Bakka jireenyaa	1. Magaalaa 2. Baadiyyaa		
103	Haala gaa'elaa	1. Leexaa 2. Heerumtee kan jirtuu	3. Kan hiikte 4. Abban manaa kan irraa du'e	
104	Sadarkaa barumsaa	1. Dubbisu fi barreessuu kan hin dandeenye 2. Sadarkaa jalqabaa 3. Sadarkaa lammaffaa	4. Qopha'na 5. Diplooma Fi isaa ol	
105	Haala hojii keetii	1. Haadha manaa 2. Daldaltuu	3. Hojjettuu mootummaa 4. NGO 5. Kan biroo	
106	Kan heerumte yo taatefi, sadarkaa barumsaa abba manaa kee	1. Dubbisu fi barreessuu kan hin dandeenye 2. Sadarkaa jalqabaa 3. Sadarkaa	4. Qopha;na 5. Diplooma fi isa ol	
107	Kan heerumte yo taatefi, haala hojiinabba manaa kee	1. Qotee bulaa 2. daldalaa	3. Dafqan bulaa 4. Qacaramaa mootummaa 5. NGO	
108	Baayyina maatii	_____		
109	Galii ji;aa maatii	_____		

Section II :- kutaa Seenaa dahumsaa wolin wol qabatu

S.N	Gaafillee	Deebii	
203	Yeroo meeqa ulfoofte?	_____	
204	Meeqa deessee?	_____	
205	Ulfi kun karooran turee?	1. Eeyyen 2. Lakkii	
206	Ulfi sirraa ba'e jiraa?	1. Eeyyen 2. Lakkii	
207	Eeyyen yo ta'ef, Yeroo meeqaf sirraa ba'ee?	_____	
208	Haala ittin ulfi ba'e	1. Ofin kan ba'e 2. Itt yaaaddee ofin baaste	
209	Ijoollee meeqa qabda?	_____	
210	Daa'imn sijalaa boqottee jirtii?	1. Eeyyen 2. Lakkii	
211	Haala da'umsa ke kana duraa	1.kara gadameessaa 2. Meeshan gargaaramtee 3. karaa baqaqsanii yaaluu	
211	Da'umsan wol qabatee rakkon sirra g'ee beeku jiraa?	1. Eeyyen 2. Lakkii	
212	Eeyyen yo ta'efi, rakkinonni si mudatan kamifaadhaa?	1. Baayyina dhiigaa yeroo da;umsaa 2. haqqisiisuu jabaa 3.mataa dhukkubbii cimaa 4. Cininsun dura dhangalahoo dursuu 5. Kan biro _____	
213	Ulfa kanaaf hordoffii da'umsa duraaf yeroo meeqa dhaabbata fayyaa deemte?	_____	

214	Yeroo jalqabaaf hordoffii ulfa duraa yeroo dhufte ulfi kee torban meeqa ture?	_____	
215	From pt. card (recommended contacts)		
	Hordoffii jalqabaa (amma torban 12 tti)	1.Eeyyen 2. Lakkii	
	Hordoffii lammataa (turban 13-20tti)	1.Eeyyen 2. Lakkii	
	Hordoffii sadaffaa (turban 21 -26 tti)	1.Eeyyen 2. Lakkii	
	Hordoffii araffaa (Torbee 27-30 tti)	1.Eeyyen 2. Lakkii	
	Hordoffii shanaffaa (torban 31-34 tti.)	1.Eeyyen 2. Lakkii	
	Hordoffii jahaffa (torban 35-36 tti)	1.Eeyyen 2. Lakkii	
	Hordoffii torbaffaa (torban 37-38 tti.)	1.Eeyyen 2. Lakkii	
	Hordoffii saddttaffaa (Torbee 39 oli.)	1.Eeyyen 2. Lakkii	
216	lakk 215 irra lakkii kn jedu yo jiraatef sababni maalii?	3. 1. hingalmoofne 4. 2. Hordoffii addan kutuu	
217	Hodoffii addan kan kutte yo ta'efi; maalifii?	1. yoom akkan deebi'u natti hin himamne 2. Fayyan qabaa 3. Sababa fageenyaf 4. Hojiitu natti baayyata 5. Tajaajilli kan nama hawwatu hin turree 6. Kan biraa	

Kutaa III gaaffiilee Beekumsaan Walqabatan

501	Dubartoonni ji'a 3 dura tajaajila hordoffii ulfaa jalqabuu akka qaban beektu?	1. Eeyyenii 2. Lakkii	
502	Ulfi dhiibbaa dhiigaatiin guddina daa'imaa irratti dhiibbaa qabaa?	1. Eeyyenii 2. Lakkii	
503	Yeroo ulfaa mallattoo balaa irratti gorsuun kunuunsa dahumsa duraa yeroon barbaaduuf si gargaaraa?	1. Eeyyenii 2. Lakkii	
504	Dubartiin ulfaa HIV qoratamuu qabdi?	1. Eeyyenii 2. Lakkii	
505	Dubartoota ulfaaf qorannoon dhiigaa HGB barbaachisaadhaa?	1. Eeyyenii 2. Lakkii	
506	Dubartiin ulfaa TT'f talaallii fudhachuu qabdii?	1. Eeyyenii 2. Lakkii	
507	Dubartoonni ulfaa ayireeenii fudhschun barbaachisaadha jettenii hin yaaddaa?	1. Eeyyenii 2. Lakkii	
508	Dubartiin ulfaa ulfaa qoricha paraasitii fudhachuu qabdi jettee hin yaaddaa?	1. Eeyyenii 2. Lakkii	
509	Hordoffiin dahumsa duraa dubartoonni rakkoolee ulfan wol qabtan adda baasuuf hin gargaaraa?	1. Eeyyenii 2. Lakkii	
510	da'umsi dhaabbilee fayyaa nageenya kan qabuu fi manatti da'uu caalaa gaarii dha jettaa?	1. Eeyyenii 2. Lakkii	

	Gaaffilee itti quufiinsa haadhoolii tajaajila kunuunsa dahumsa duraatiin walqabatee	Deebii					
	Gaaffiilee	gala	5.Cimseen walii	4.woliin gala	3.yaada hingabu	2.wolii hin galuu	1.cimsee woli hingalu
701	wolitti dufeenya ogeessa fayyaa wajjin qabdu akkamitti madaalta?						
702	Yeroo hordoffii keetti mijataa fi kabajin sitti dhaga'amee?						
703	tajaajila barbadde akka salphaattii argttee(fkn; kannen akka lab,altrsaa'ondi faa)						
704	waa'ee kee fi ulfa kee odeeffannoo gahaan sitti himameeraa?						
705	Yeroo tajaajila kunuunsa dahumsa duraakkeetti qulqullina naannoo tajaajilaatiin gammachun sitti dhaga'amee?						
706	Yeroo kunuunsa argachuuf sitti fudhaten hangam itti quufteetta?						
707	Yeroo gorsaa ykn qorannoo iccitiin kee eegamuu hangam itti quuftee jirtaa?						
708	Tajaajila kunuunsa dahumsa duraa naannoo tajaajila kanaatti hiriyoota ykn firoota kee ni gorsitaa?						

Kutaa gaaffilee dhaabbta faayan wol qabatan

S.N	Gaaffiilee	Deebii	
401	dhaabbatin fayyaa naannoo kee jiraa?	1. Eeyyen 2. Lakkii	
402	fageenyi mana keetii amma dhaabbata fayyaa	Daqiiqaa _____	
403	gara dhaabbata fayyaa maalin deemtaa?	1. Miilan 2. Frdaan ykn Gaangoon	

		3. Geejiba uummatatin	
404	tajaajilaaaaaaaaaaaaaaaaaf kaffaltin kaffalte jiraa?	1. Eeyyen 2. Lakkii	
405	yo kaffaltee ta'efi hagam kaffaltee?	Qarshii ____	
406	amma tajaajila argatutti hagam turtee?	Daqiiqaa _____	
	Gaaffilee murtoo kennuu haadhoolin wol qabatan		
	Gaaffilee	1.abbaa manaa qofa	2.haadha manaf abbaa manaa wolin 3.haadha manaa qofa eshee
091	Galii manaa ati galchitu akkataa itti fayyadamitu eenyutu murteessaa?		
092	Galii manaa abban manaakee fidu akka itti fayyadamtu eenyuutu murteessaa?		
093	Bittaa meeshaa gatiin isaanii xixiqqaa ta'e(fkn, mindhan nyaataa) eenyutu murteessaa?		
094	Bittaa meeshaa gatiin isanii qaalii ta'e fkn mi'a mana Keessaa eenyutu murteessaa?		
095	Maatii eenyuuf yoom akka gaafattan eenyutu murteessaa?		
095	daa'imman meeqa akka qabaattan eenyutu murteessaa?		
096	daa'imman yeroo dhukkubsatan mana yaalaa deemanii akka yaalamanif eenyutu murteessaa?		
097	Yeroo baayyee gosoota ittisa ulfaa kamiyyuu kan akka kondomii ykn kiniinii fayyadamuuf eenyutu murteessa?		

	Gaaffilee degersa hiriya ykn abba manaan wol qabatan					
	gaaffiilee	5.cimseen woli gala	4.ittan wolingala	3.yaad	2.wolii hin galu	1.cimsee itiin woli hingalu
051	Hamma hirmaannaa abban manaa koo ijoollee koo wajjin qabdu irratti miira gaariitu natti dhagahama.					
052	Fedhii abba mana koo koo ijoolleef agarsiisutti baay'een gammada					
053	Hamma itti gaafatamummaa abbaan manaa koo ijoollee guddisuuf fudhatteetti gammadeera					
054	Fedhii abbaan manaakoo ijoollee godhachuf qabutti nan gammada					
055	Yeroo abban manaa koo ijoollee kootiif kennutti nan quufa.					
056	Yeroo baay'ee abban manaa koo ijoolleedhaaf gargaarsa gahaa hin godha					
057	Abban manaa koo warra ta'uun kutaa jireenyaa Keessaa isa barbaachisaa fi gatii guddaa qabu jedhee waan yaaduf baay'ee na gammachiisa					
058	abbaan manaa koo waa'ee guddina daa'ima beekumsa gahaa qaba, kunis akka warraatti mijataa akka ta'u kan godhuudhaa .					

Hirmaanna kef galatoomii

Declaration of Investigator

I, the undersigned student of Maternity and Reproductive Health Nursing, declare that this thesis is my original work in partial fulfillment of the requirement for a master of science degree in Maternity and Reproductive Health Nursing to my knowledge.

Name of investigator: Sr. Anane Mulatu

Signature: _____ Date _____

Declaration of Advisors

We, the undersigned Advisors, declare that this research thesis is our original work in partial fulfillment of the requirement for a Master of Science degree in Maternity and Reproductive Health Nursing for the stated student above to our best knowledge. We confirmed that this research thesis is ready for defense with our approval as the university advisor(s).

Date of Submission: _____

Name of primary Advisors:	Signatures	Date
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Name of secondary Advisors:	Signatures	Date
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Department head:

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