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DEPARTMENT OF PUBLIC HEALTH

Timely Initiation of Antenatal Care Visit and Associated Factors Among Pregnant Mothers Attending Public Health Facilities in Enamorena Ener woreda Gurage Zone, Southern Ethiopia:2022.

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ABBREVIATIONS AND ACRONYMS

ANC	Antenatal Care
EDHS	Ethiopian demographic and Health Survey
EMDHS	Ethiopian mini demographic health survey
HIV	Human Immune Deficiency Virus
MMR	Maternal Mortality Ratio
CI	Confidence Interval
OR	Odd ratio
SPSS	Statistical Package Social Science
WHO	World Health Organization
AOR	Adjusted odd ratio
COR	Crude odd ratio
HCC	Hepatocellular carcinoma
SNNPR	Southern Nation's Nationalities and Peoples Region
NGO	Non-governmental organization
LNMP	Last Normal menstrual Period
ETB	Ethiopian Birr

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ABSTRACT

Background

Because of physiological changes that occur during pregnancy, mother and her baby are facing life treating problems. To avert the problem Antenatal care is more important when received timely in the pregnancy and continued through delivery. Nevertheless, true progress has been made globally in terms of increasing access and use, still high numbers of maternal deaths and stillbirths have occurred. Globally around 2.6 million stillbirths annually and 830 maternal deaths every day occur due to the pregnancy related cause. Now a time World Health Organization adopt a new ANC model that recommend to increase the numbers of contact from four visits to eight contacts for the aim of reducing prenatal mortality and to improve women experiences of care. According to the survey (EDHS 2016) only 20% of women have their first ANC during the first trimester of pregnancy.

Objective: to assess timely initiation of antenatal care visit and associated factors among pregnant mothers attending public health facilities in Enamorena Ener woreda, Gurage zone, SNNPR, Ethiopia: 2022.

Methods: Institutional based cross-sectional study was conducted from May 10 to June 18, 2022 to assess the timely initiation of ANC visit and associated factor on 240 pregnant women.

Simple random sampling was used to select four public health facilities among nine public health facilities. Consecutive sampling technique was used to select 240 study participants. Data has been collected by group member. The collected data were entered, cleaned, coded and analysed using SPSS statistical software version 21. Adjusted odds ratio with 95% Confidence interval is used to determine the strength of association. In multivariable logistic regression variable with p-value less than 0.05 is considered as statistically significant association between covariates and dependent variable

Result: the study revealed that only 31.7% of the study respondents have started first ANC visit timely. Age category between 40 and 45 (AOR= 0.98,CI 0.34-0.99 p=0.045), Family monthly income (AOR=1.02 ,CI 95%, 1.01-11.5 , P=0.03), knowledge of right time to begin first ANC visit(AOR=0.47 CI 95% 0.14-0.96,p=0.02) , women with no

history of abortion(AOR=0.96,CI95% 0.01-0.98,p= 0.02) have shown significant association with timely booking of first ANC.

Conclusion: the proportion of pregnant mother who practiced timely booking in this study area is low

1. INTRODUCTION

1.1. Background of the study

Pregnancy is one of the most important periods in the life of a woman, a family, and a society(1) While, because of these physiological changes that occur during pregnancy, mother and her baby are facing life treating problems. To avert the problem, there are different maternal health care services provided for minimizing the problem. One of the services is Antenatal care (ANC)(2) ,which is defined as the complex of interventions that a pregnant woman and adolescent girl receives from skilled health care professionals in order to ensure the best health conditions for both mother and baby during pregnancy(3).the health of the new born & infant survival is closely related to the care a mother receives during child birth, so ANC promotes the health of pregnant women and has been found to reduce the risk of adverse pregnancy outcomes, perinatal and infant mortality and morbidity(4,5).

Globally around 2.6 million stillbirths annually and 830 maternal deaths every day occur due to the pregnancy related cause. Among all deaths, 99% occurred in the developing countries as compared as 1% in developed countries (6, 7). Many maternal and prenatal deaths occur in women who have not received timely, inadequate and no utilization of ANC (8)

The timing of Antenatal care booking is one of the basic components of ANC services. It helps to early detection, managing, and preventing problems that occur during the pregnancy time. According to WHO Focus antenatal care model recommendation, all pregnant mothers are better to start ANC booking within the first trimester of pregnancy (within 12 weeks) (5). In addition, now a time World Health Organization adopt a new ANC model that recommend to increase the numbers of contact from four visits to eight contacts for the aim of reducing prenatal mortality and to improve women experiences of care (5,10).

Existing evidence in the global shows that the prevalence of early timing of antenatal care visits is around 43%. According to the report, there is a high discrepancy between developed and developing regions (11). The report shows that 85% of mothers in the developed region start their ANC follow up earlier but it was below 45% and less than 25%` in the developing countries and sub-Sahara region respectively (12). According to different demographic health survey report in sub-Sahara countries shows that the prevalence of early timing of ANC visit ranges from 17.6 to 20% (10, 11, 14).

According to Ethiopian demographic health survey,2016 report indicates that 20% of pregnant mothers started their Antenatal care visit at the first trimester of pregnancy from that 44% of the mothers live in the urban, start ANC visit at the first trimester of pregnancy compared to 17% in the rural community(10). Different literature conducted in Ethiopia also shows that the prevalence of early timing of ANC visit ranges from 17 to 41(15–17).Studies conducted in developing countries showed that residence, educational status of the mother, husband occupation, parity and planned or wanted pregnancy was factors for late ANC booking (18, 19). Studies conducted in the urban Ethiopia shows that age of the mother, educational status of the mother, previous history of ANC, perceive adequacy of ANC ,low monthly income, receiving advice on when to start ANC visits, household food insecurity, parity, urine test as a means of pregnancy recognition, and unplanned pregnancy was a determinant of the timing of ANC visits (15,16).Studies conducted in rural Ethiopia showed that age of the mother, parity, planned pregnancy, media access, knowledge about the time of ANC booking, and advised to book within 12 weeks was affected the timing of antenatal care visit

The new World Health Organization ANC model states that every pregnant woman is at risk of complications and recommends early an ANC visit, of which the first should be during the first trimester. The visit is used to classify pregnant women in to two groups based on previous history of pregnancy, current pregnancy state, and general medical conditions. Those eligible to receive routine ANC (basic component) and those who need special care on average account for 25% of all pregnant women initiating ANC (20). Low ANC coverage, few visits, and late booking are common problems throughout Sub-Saharan Africa posing difficulty in accomplishing the WHO recommendation (21)

Worldwide, approximately 830 women died every single day due to complication during pregnancy or child birth in 2015. Reducing maternal Mortality ratio from 216 per 100,000 live births in 2015 to less than 70 per 100,000 live births by 2030 will require a global annual rate of reduction of at least 7.5% -which is more than triple the annual rate of reduction that was achieved between 1990 and 2015(22). Most maternal deaths are preventable as the necessary medical interventions are well known. Therefore, it is crucial to increase access of the women to quality care before, during and after child birth. Proportion of reproductive age women in Ethiopia who received antenatal care (ANC) from skilled provider has increased from 32% in 2011 to 62% in 2016. But only 34% of them had at least four ANC visit during their last pregnancy (23). According to the survey only 20% of women had their first ANC

during the first trimester of pregnancy. For many of the essential interventions in ANC, it is crucial to have identification of underlying conditions earlier- for example prevention of congenital syphilis, prevention of maternal to child transmission of HIV from mother to child, to prevent maternal and neonatal tetanus, control of anemia, and prevention of malaria complications. Hence the first ANC visit should be as early as possible in pregnancy, preferably in first trimester (24).

1.2 Statement of the Problem

Timely initiation of ANC helps health care providers to diagnose pregnancy related complications and offers timely and appropriate intervention (25). Not attending the ANC service timely has increase the risk of poor outcomes, maternal and neonatal death. Late initiation of ANC service affects the intended benefits of ANC service for pregnant mothers. Therefore, late initiation of ANC service imposes difficulty on effective implementation of the routine ANC strategies that facilitates maternal wellbeing and good perinatal outcome(24).

As reported by EDHS 2014 the major causes of maternal deaths are obstructed labor, ruptured uterus, severe pre-eclampsia or eclampsia, malaria and complications of abortion. All these mentioned causes of maternal death can be prevented by early initiation of ANC and having minimum recommended ANC visit (26).

Early ANC booking and regular follow-up of services usually provides opportunities for delivering health information and interventions (i.e. via early detection of modifiable preexisting medical conditions like Heart disease, Diabetes Mellitus, Hypertensive disorders, HIV/AIDS, and severe anemia) that can significantly enhance the health of the mother and fetus. In contrast, opportunities to provide information and other interventions pertaining to their reproductive health and the health of their unborn child are missed when a woman initiates ANC in late time of her pregnancy(27).

Pregnant women should be offered screening for HIV infection early in pregnancy since appropriate ANC interventions can reduce mother-to-child transmission of HIV infection. Intervention help the woman learn more about HIV infection and its implications for her

health, access support groups and health services that promote positive living and make choices about sexual behavior and future fertility (28).

World Health Organization (WHO) recommends that all pregnant women in areas of stable malaria transmission should receive at least two doses of Intermittent Presumptive Therapy for malaria at the beginning of second trimester or after quickening (first noted movement of the fetus) during routinely scheduled antenatal clinic visits (29). Thus, late antenatal attendance makes it difficult to implement effectively the above and other routine ANC strategies that enhance maternal wellbeing and good perinatal outcomes. In this regard, the identification of factors associated with late ANC attendance is a major public health objective. It could help come up with strategies that could improve the quality ANC service provision and timing of first ANC attendance.

Screening for syphilis should be offered to all pregnant women at an early stage in ANC because treatment of syphilis is beneficial to the mother and fetus. In pregnant women with early untreated syphilis, 70% to 100% of infants will be infected and one-third will be stillborn (30). Pregnant women also offered iron and folic acid supplementation in early pregnancy. Supplementation of iron and folic acid for pregnant women and for those who are at risk of nutritional deficiency until 12 weeks of gestation reduces the risk of a baby born with neural tube defects such as anencephaly and spinal bifida (31, 32). Screening hepatitis B should have to be offered for all pregnant women early because chronically infected person are at increased life time risk for cirrhosis and HCC. Also it is associated with high risk of maternal complication and comes with its attendant effect of both mother and child

Although the reasons for late initiation of ANC visit vary from context to context, the major ones include lack of awareness about the antenatal care services and wrong perceptions about the purpose of the antenatal care services and their timing. Some of the wrong perceptions about the timing of ANC are related to the women's low educational status, lack of knowledge of ANC, and cultural and traditional beliefs related to health care seeking practices during pregnancy (21).

Although maternal mortality worldwide drops by about 44% between 1990 and 2015, more than 800 women (99% of them are from developing countries) daily due to preventable causes related to pregnancy and child birth. (23). In Ethiopia, maternal mortality ratio is reduced from 676 to 412 maternal deaths per 100,000 live births between 2011 and 2016, and

coverage of ANC is 62% (33).Only 28% of women had their first ANC visit during the first trimester, while 32% had their first visit during the fourth or fifth month of pregnancy and 12% had their first visit during the sixth or seventh month. Two per cent of women did not receive any ANC until the eight month of pregnancy or later EDHS 2016.

Despite the fact that the ANC utilization is essential for further improvement of maternal and child health little is known about the factors affecting the use of this service timely in Ethiopia particularly in SNNPR region. Thus not attending ante natal care early makes it difficult to implement effectively the above and other routine ANC strategies that enhance maternal wellbeing and good perinatal outcomes. The identification of factors associated with not attending ANC early is a major public objective. It could come up with strategies that could improve the quality of ANC service provision and timing of first ANC attendance

Therefore, the aim of this study is to assess the prevalence and associated factors of Timely initiation of antenatal care visit and among pregnant mothers attending public health facilities, in Enamorena Ener Gurage zone, southern Ethiopia 2022.

1.3. Significance of the study

Literature has generally indicated the importance and the benefits of ANC, therefore research needs to be done to understand the reasons for not initiating antenatal attendance timely. pregnant women is at risk of pregnancy related complication. To minimize the risk timely initiation of ANC is important for essential diagnosis and treatement of the cases. But there is a gap in early initiation of ANC in our country. There is inadequate study conducted on timely initiation of ANC visit within recommended time in Enamorena Ener Woreda as far as our knowledge is concerned. It is hoped that information obtained from this study will add to the existing body of knowledge in the area of maternal and child health. The results of this study may also be of use to health policy makers and other stakeholders for developing healthy public policies as regards reproductive health. It also offers students important information for further studies. Consequently, the findings might help to enhance family and social support system for pregnant women in communities.

2 Literature Review

2.1. Prevalence of timely initiation of Antenatal Care Visit

A cross sectional study investigated in Cameroon showed that early initiation of ANC prevalence is 46% among women aged 15–49(34).

A study conducted in Buhtan showed that, Among 868 women studied, 67% (n = 584) had a late booking (after 12 weeks), and 1% (n = 13) had no booking (35).

According study done in Ethiopia public health centers, 60.5% of women were late to initiate the first antenatal care visit (36). Similarly according to the study done at Public Health Centers in Kembata Tembaro Zone, Southern Ethiopia, the proportion of respondents who made their first ANC booked late (after 12 weeks of gestation) is 269 (68.6%) while only 123 (31.4 %) booked within the recommended time (before or at 12 weeks of gestation)(37).

The study done in Shebedino woreda Sidama zone Southern Ethiopia showed that only about 21.72% of respondents have started their ANC within the recommended time and the remaining 78.28% booked lately(38).

Study done in Debre birhan health institution, central Ethiopia showed that only about 26.2% pregnant mothers started their first ANC visit early, while the rest (73.8%) started late (39).

The study done in Shebedino woreda Sidama zone Southern Ethiopia showed that only about 21.72% of respondents have started their ANC within the recommended time and the remaining 78.28% booked lately(39).

2.2. Factors associated with timely initiation of antenatal care

There are a number of studies done to establish factors relating to late antenatal attendance in the world. The related factors include place of residence, ethnicity, age, education, employment status, and parity, intention to get pregnant, use of contraceptive method, economic status and travel time(40).

2.2.1 Socio demographic factors

The level of antenatal care utilization and first ANC booking were found to be significant among women of better education, married, urban setting, older and employed women as shown by study conducted in central Uganda, Kassala, Eastern Sudan, in Lao People's Democratic Republic(40,42).

Cross sectional Study conducted in Nigeria and Cameron indicated that more educated women are more likely to book early in the first trimester (43,44)Antenatal care utilization is more common in younger women age 20- 34 and which accounts around 36 percent but, women age 35 -49 received antenatal care utilization is 27 percent(45). Maternal age is found to be a factor in the utilization of early ANC services. A study in Pakistan showed that a higher proportion of women 15–24 received ANC within the first 3 months compared to women 35–49 (51 % vs 38 %).Women of older age have late first ANC visit and fewer number of visit compared with younger one in a cross sectional study done in Nepalese(46).

Study done in Gonder reported that, pregnant mothers at younger age were 3.83 times more likely to book earlier compared to older ones (47). Similarly study done in Dilla town also showed that the same result, respondents age 35 and above were less likely to book timely as compared references (48).

Study in Indonesia shows that urban mothers reported receiving the various antenatal care services more often than rural mothers. Women in urban areas are more likely than those in rural areas to come for the first antenatal care visit before the fourth month which is 85 per cent and 76 per cent, respectively (49).

Women with no education were more likely not to receive ANC while those with at least secondary education were less likely not to receive ANC compared to those with primary education. Study in Sudan showed that women who did not use antenatal care services were those who had less education and those of rural residency and husband education ≤ secondary level were associated with inadequacy of antenatal Care (40, 50). Being an urban or rural residence can determine the use of ANC service and first visit. Generally urban dwellers are more likely to utilize ANC and booked early than the rural one (44).

2.2.2 past obstetric history

Cross sectional study conducted in Pakistan revealed that as parity increase, the mothers became late in initiating first ANC visit (60 % of women at parity one received ANC within 3 months, compared to 48 of women at parity three and 33 % of women at parity five(51).

Study done in Nigeria revealed that parity being main proximate determinant of first ANC visit. It has reported that the higher the parity, the more likely the parturient feels experienced enough in childbearing not to require early booking. But these women are actually more likely to have high-risk pregnancies with the attending problems of multi gravidity and complications of advancing maternal age (43).

Another study in Nigeria, 53.3 per cent of women were lately booked ANC and parity was indicated as influencing factor (52). But, in Indonesia, an 85 per cent of mothers received antenatal care for a first pregnancy compared with 69 per cent of mothers who were pregnant six and above pregnancy (53). A mother of an unplanned child would be 20 per cent less likely than a mother of child who wanted to initiate timely ANC and 30 per cent less likely to have three or more ANC visits during particular pregnancy ($p<0.05$ in both cases)(54).

Study conducted in Dilla town showed that respondents with parity 1 were 1.8 times more to book first Antenatal care timely as compared respondents those who had parity one and above (55), and the study in Hadiya showed that out of the obstetric factors considered, number of delivery experience and parity were found to be determinants of ANC service utilization. As the order of birth decreases utilization of ANC becomes less likely(56) similar study in Debra birhan reported that Nulliparous mothers were 3.65 times more likely to start first ANC visit early as compared to those who had at least one history of birth(57).

2.2.3 Past experience of ANC service utilization

Study done in Nigeria showed that mother's previous experience of undesired birth outcome, like stillbirth, has significant effect on early booking. It underlines that such experience forms correlation between complications in subsequent pregnancy and previous one (43). According to EDHS 2011, 46 per cent of Women were almost twice as likely to receive antenatal care from skilled provider at first births but only 23 per cent of women received ANC at birth sixth and above births(55). A 26.7 percent pregnant women complained that waiting for a long time while antenatal care utilization which hinders to ANC service

utilization(59).Similarly, other study conducted in Dilla revealed that quality of previous service and satisfaction influence booking and 28.7 per cent of women complained long waiting time as hindering factors for booking of first ANC timely(58).

Concerning husband involvement, study conducted in Japan showed that 7.3 percent of pregnant women were supported by their husbands to visit ANC by providing information (59), also another study in Pakistan reported that lack of permission from husband hinders to use ANC service. Amongst the women who did not use antenatal care 60 percent did not have permission from their husbands (60). Study in Namibia and Kenya indicated, decision-making of wife only or husband only is associated with less antenatal care utilization as compared to joint decision making(61).

2.2.4 Knowledge and awareness on timing of ANC

Among the most frequent reasons given for late attendance ANC where; women did not know that they are pregnant which accounts 21.7 per cent and women have no time to follow up as recommended by WHO which accounts 20.8 percent from women included in the study (62). The study done in bahir dar showed that, the odds of early timing of antenatal care visit among mothers who were knowledgeable on the timing of ANC visit were 2.1 times higher than the counterparts (63). According to recent systematic analysis knowledgeable women are less likely to delay their ANC booking as compared to non- knowledgeable women (21).

2.3 Conceptual framework

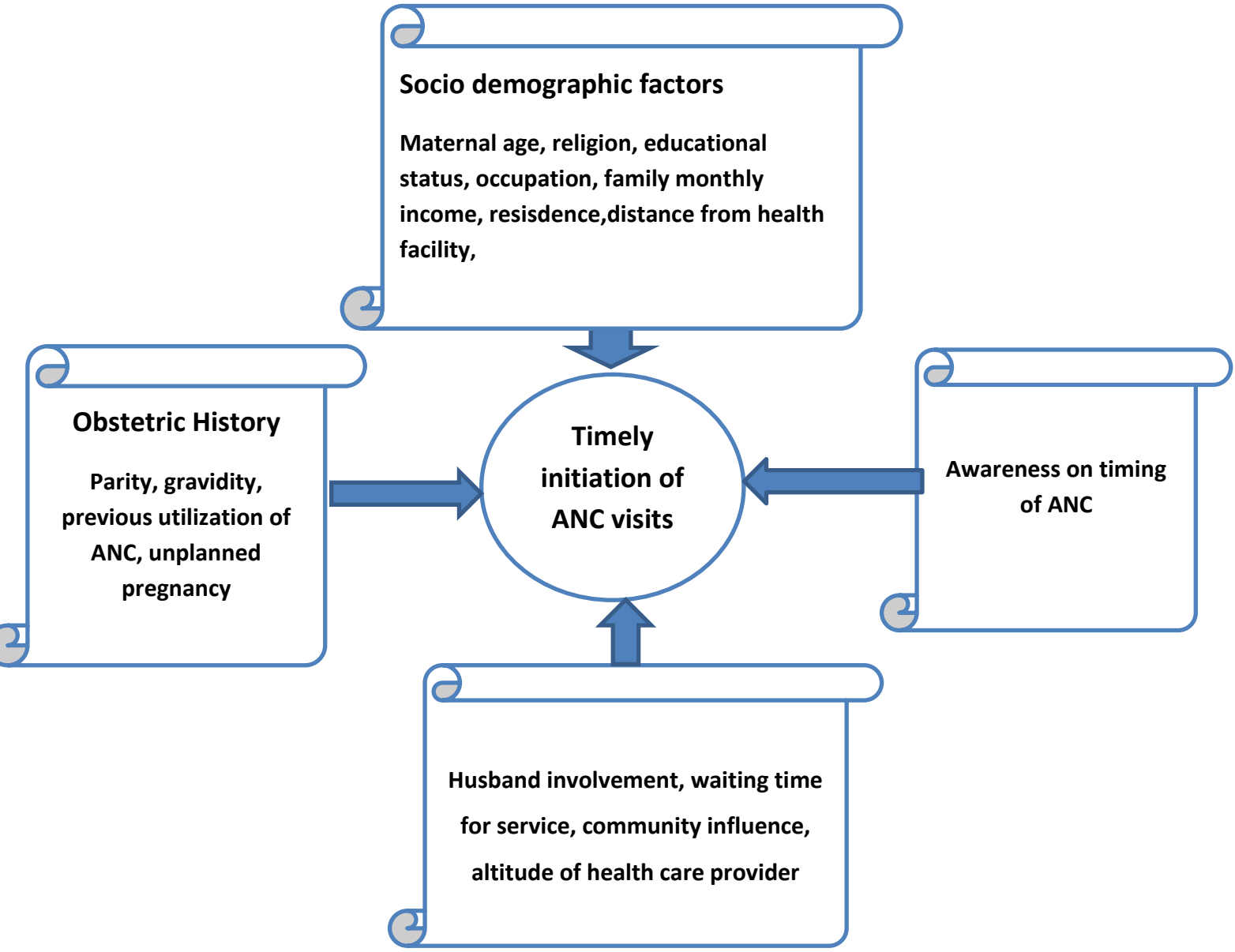

Figure 1.0 Conceptual framework on timely initiation of ANC visit and associated factors among pregnant women attending public health facilities in Enamorena Ener Woreda, Gurage zone, Ethiopia 2022

3 Objective

3.1 General Objective

To assess the prevalence of timely initiation of antenatal care visit and associated factors among pregnant women attending public health facilities in Enamorena Ener woreda, Gurage zone Southern, Ethiopia,2022

3.2 Specific objective

1. To determine the prevalence of timely initiation of antenatal care visit among pregnant women attending public health facilities in Enamorena Ener woreda, Gurage zone, Southern Ethiopia, 2022

2. To assess factors associated with timely initiation of antenatal care visit among pregnant women attending public health facilities in Enamorena Ener woreda, Gurage zone, Southern Ethiopia,2022

4. Methodology

4.1. Study area

The study was conducted in Enamorena Ener woreda Gurage zone, SNNPR Ethiopia from May 10 to June 18, 2022. The Woreda's town is called Gunchire which is located 190 km away from capital city of the Ethiopia, 301Km from capital of SNNPR (HAWASSA) and 42 km away from Wolkite, capital city of Gurage zone. Total population of woreda is estimated to be 153681. From this 75309 is female and 78372is male. The woreda has one primary hospital and nine Health centers. Among nine health centers two are under NGO. The hospital was established in 2007 and serves the entire Gunchire town population and woreda, provides both in-patient and out-patient services to the clients.

4.2. Study Design and Period

An institutional-based cross-sectional study was conducted from may 10 to June 18, 2022.

4.3 Population

4.3.1 Source population

All pregnant mothers attending ANC visit in public health facilities, in Enamorena Ener Woreda during study period

4.3.2 Study Population

Pregnant women who are attending ANC in public health facilities in Enemorena Ener woreda during data collection period

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria:

All pregnant mothers who attend ANC in selected health facilities was included.

4.4.2 Exclusion criteria:

Those who are not hearing and seriously ill during data collection period.

4.5 Sample size determination

The sample size was determined by using single population proportion formula based on the following assumption: 95% confidence level, 5% margin of error, and prevalence of timely booking was 17.5%[from the previous study conducted in Oromia region, Wollega zone [28].

ni = (zα/2)2 p(1-p)/w2;

Where n- Sample size

Zα/2- critical value =1.96 for 95% CI

P- Prevalence of timely initiation of ANC =17.5% from previous study(28).

w- Margin of error= 0.05 n= (1.96)2 0.175(1-0.175)/ (0.05)2

With the above inputs the total sample size required was 219. By adding non response rate of 10% the total sample size is 240.

4.6 Sampling Technique

Simple random sampling was used to select four public health facilities among 10 public health facilities which are found in Enamorena Ener woreda then after the total sample size will be allocated for four randomly selected public health facilities, based on average number of pregnant mothers attending ANC visit during data collection period(i.e., 119 to site 1 (N1 = 308), 32 to site 2 (N2 = 82), 48 to site 3 (N3 = 124), 41 to site 4 (N4 = 106) .Consecutive sampling technique will be used to select study participants.

The sample size for each public health facilities was calculated by multiplying pregnant mothers attending ANC in specific health facilities by total sample size (240) and dividing the product to the total pregnant mothers attending ANC at selected study area during data collection period.

nj=(n*Nj)/N

Where n = 240 (Total sample size)

N= (Total pregnant mothers attending ANC at selected study area during data collection period)

nj= (sample size to be assigned for each institution)

Nj= (Average pregnant mothers attending ANC at each institution during data collection period).

Accordingly, sample size for specific sites based on mentioned formula

1.Gunchire Primary Hospital nj=(n*Nj)/N 240*308/620 = 119 Site 1

2 Indahora Health Center nj= (n*Nj)/N 240*82/620 = 32 Site 2

3. Gusbagaya Health Center nj= (n*Nj)/N 240*124/620 = 48 Site 3

4. Terawengne Health Center nj= (n*Nj)/N 240*106/620 = 41 Site 4

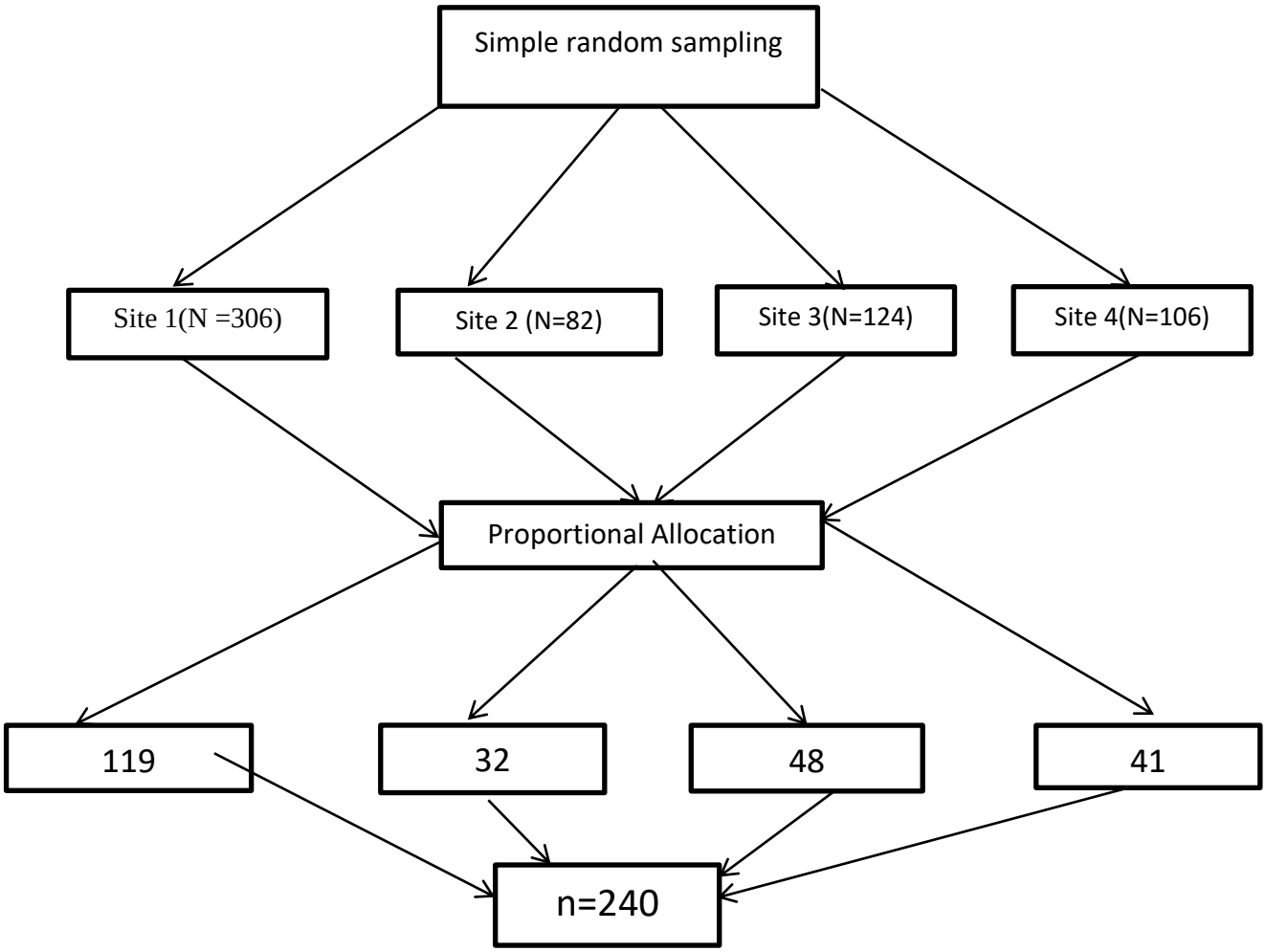

Figure 2. Sampling procedure of the study participant on timely initiation of ANC and associated factor among pregnant mother attending ANC in Public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022.

4.7. Study variable

4.7.1 Dependent variable

Timely initiation of ANC

4.7.2 Independent variables

- Distance to health facility
- Attitude towards health professionals
- Occupation
- Education
- Parity
- Age
- Obstetric history
- Knowledge of ANC services

4.8 Operational Definition

Antenatal care : Is a medical and general care that is given for pregnant mother during pregnancy(2).

Timely initiation of ANC: The pregnant mother starts or receives ante natal care service at 12 weeks of gestational age (57).

Abortion Is termination of a pregnancy before 28 weeks' period from LNMP (Last Normal Menstrual Period) and if LNMP is not known fetal weight less than 1kg, resulting in the death of the foetus in Ethiopia (64).

Still birth :The death of newborn after 28weeks of gestation and during labor (64).

Gravidity: Number of times a women is or has been pregnant regardless of pregnancy outcome (64).

Parity: Number of pregnancy reaching viable gestational age (after 28 week) including live birth and still birth (64).

Multigravidity: A woman who has been pregnant more than two times(64).

Cesarian section : A surgery to deliver one or babies(65).

4.9 Data collection

4.9.1 Instrument

Data was collected using a standardized and well-structured and pre-tested questionnaire.

4.10 Data quality control

The questionnaire was tested before starting the actual data collection for one day on 5% of population different from study area which was in wolkite university specialized hospital. In order to catch up the concept, discussion on questioner was done with group member and data collection was started: finally an ongoing super vision was made by revising the data before analysis, this was to avoid error and misunderstanding of data collection and research development.

4.11 Data processing and analysis

After data collection, each questionnaire was checked for completeness and consistency by data collectors. The data was entered and processed by SPSS version 21 statistical Software's for analysis. Descriptive statics such as frequencies, proportions and summary statistics was used to describe the study population in relation to relevant variables. The association was considered significant, when the p-value was less than 0.05. Finally the result of the study was presented by tables, graphs and frequency distributions.

4.12 Ethical consideration

Official support letter was obtained from Wolkite University college of medicine and health science to Enamorena Ener woreda Administration and health office. Further, names of respondents was excluded and confidentiality ensured for any information obtained from the patients. Oral consent was obtained from the respondents prior to the interview. The information is only used for the purpose of study.

4.13 Dissemination of Results

The findings of the study were presented to the School of Public Health, college of Medicine and Health sciences, Wolkite University Furthermore, every effort will be made to publish the thesis on international research journals.

5. Result

5.1. Response coverage

All of 240 attendants were participated in the study making 100% response rate.

5.2. Socio-demographic characteristics

Out of 240 (100%) respondents, the majority of participant mothers were age between 25-29 82(34.2%). The mean and standard deviation age of participant is 27.8(-/+ 5.22). Two hundred thirty six (98.3%) mothers were married and 89(37.1%) were house wife.

The ethnic composition of study participants shows that Gurage (82.9%) are the dominant group followed by Amhara (7.5%). The majority of participants 158(65.8%) were Muslim followers and followed by Orthodox 62 (25.8%), Protestant 18 (7.5%) and Catholic 2(0.8%). Regarding educational status of the mother, majority 103(42.9) didn't attend formal education and (38.3%) enrolled till primary and (18.8%) secondary. Majority of the respondents 136 (56.7%) were Rural residents. Nearly less than half of pregnant women (37.5%) had monthly income of 1000-2000 ETB. To get nearby health facility, for most of pregnant mother 100(41.7%) it took half hour to one hour.

Table 1 Socio Demographic characteristics among pregnant mother attending ANC in Public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022.

Variable		Frequency	Percentage
Age	15-19	14	5.8
	20-24	44	18.3
	25-29	82	34.2
	30-34	54	22.5
	35-39	38	15.8
	40-45	8	3.3
Ethnicity	Gurage	199	82.9
	Kebena	13	5.4
	Amhara	18	7.5
	Other	10	4.2

Residence	Rural	136	56.7
	Urban	104	43.3
Marital status	Married	236	98.3
	Other	4	1.7
Level of education	No formal education	103	42.9
	Primary	92	38.3
	Secondary and above	45	18.8
Religion	Orthodox	62	25.8
	Muslim	158	65.8
	Protestant	18	7.5
	Catholic	2	0.8
Family monthly income	<500	36	15
	500-1000	59	24.6
	1000-2000	90	37.5
	>2000	55	22.9
Distance in hours from health facility for pedestrian	<30 min	63	26.3
	30min-1hr	100	41.7
	1-2hr	57	23.8
	>2hr	20	8.3

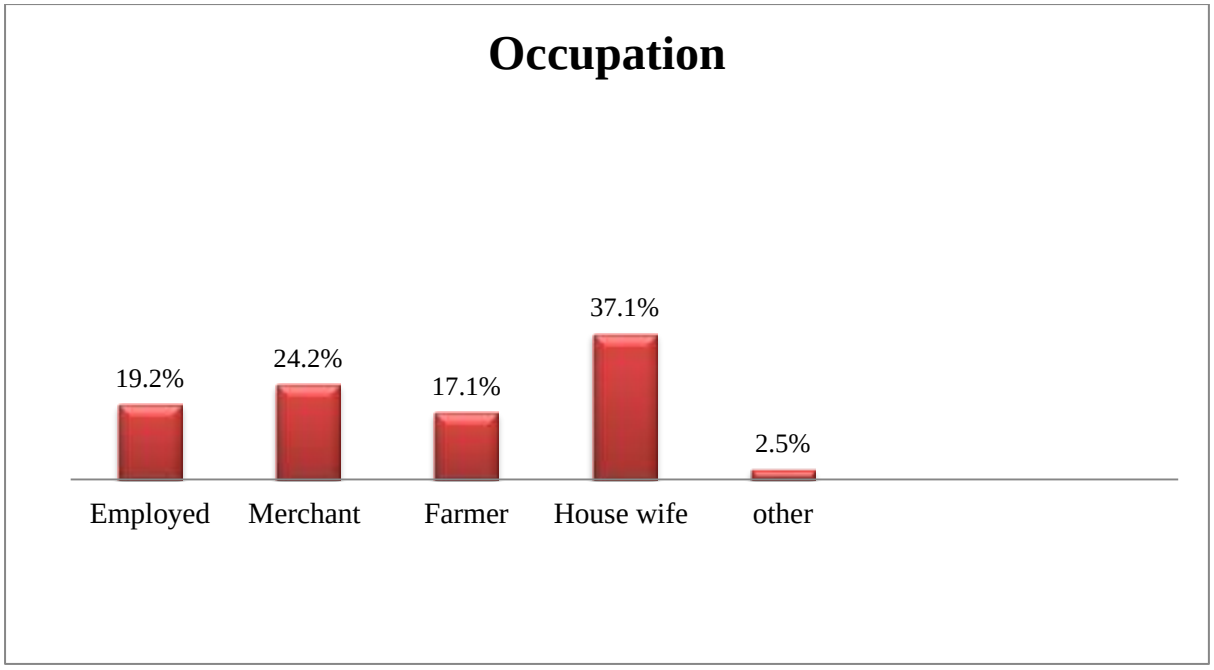

Figure 3. Occupation of pregnant mothers attending public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022

5.3 Obstetrics history

Among the total participants 202 (84.2) were multi gravid and about 166 (69.2%) were multiparous. The mean and standard deviation of number of alive birth accounted 4(-/+1.57) Still birth accounted around 12(5%) from the total birth and abortion accounted 16 (6.7%) from the total respodents. Majority of respondents 177(73.4%) reported that they didn't have other complication related to pregnancy.

Most of the mother's last child were 112 (46.5%) between the age 2-4 years and more than half of the previous and current was unplanned making it 146(60.8%),151(62.9%) respectively.

Table 2 Obstetrics history of pregnant mother attending ANC in Public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022

Variable		Frequency	Percentage
Gravidity	Prim gravid	38	15.8
	Multigravid	202	84.2
Parity	Primiparous	36	15
	Multiparous	166	69.2
If multi gravid No of alive children	1-3	90	37.5
	4-6	104	43.3
	>=7	8	3.3
Any still birth	Yes	12	5
	No	190	79.2
Any Abortion	Yes	16	6.7
	No	186	77.5
Other complication in the last pregnancy	Yes	26	10.8
	No	177	73.4
Age of last child in year	<2	27	11.2
	2-4	112	46.5
	5-6	51	21.2
	>	12	5
Any history of cesarean section	Yes	36	15
	No	166	69.2
If multi gravid,Was pregnancy planned	Yes	56	23.3
	No	146	60.8
Is the current pregnancy planned	Yes	89	37.1
	No	151	62.9

5.4 ANC utilization

From all multigravidas 195(81.3%) had ANC for the last pregnancy among this mothers 137(57.1%) had first ANC >12 weeks and from all respondents around 164(68.3%) had first ANC after 12 weeks their current pregnancy.

Most of them 148(61.7%) had 3-5 visits for their current pregnancy

Table 3 . ANC Information of pregnant mother attending ANC in Public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022

Had ANC for the last pregnancy	Yes	195	81.3
	No	7	2.9
Age of pregnancy at first ANC visit for the last pregnancy	<=12 weeks	58	24.2
	>12 weeks	137	57.1
No of ANC visit for the current pregnancy	<3	80	33.3
	3-5	148	61.7
	>5	12	5

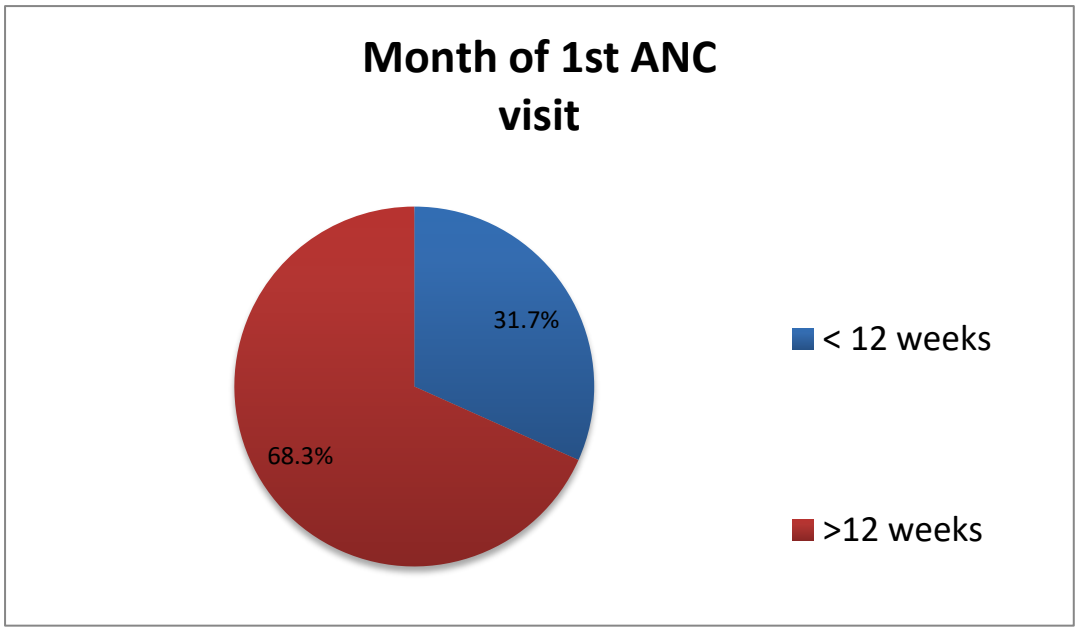

Figure 4 .Month of first ANC for the current pregnant mothers attending public health facilities in Enamorena Ener Woreda , Gurage Zone ,Southern Ethiopia

5.5 ANC Knowledge

Out of total respondents, two hundred seventeen (90.4%) reported that ANC service is important for the mother and also 224(90.3%) said that it's important for fetus. Most of them 140(58.3%) said the appropriate time to begin ANC is after 3 month.

Two hundred twelve (88.3%) participants responded as eight and above ANC visit is not needed for pregnant women during normal pregnancy.

Out of the two hundred forty respondents around 44 (18.3%) mothers reported that early initiation of ANC is only for pregnant women with a history of complication. Majority of the respondents 210(87.5%) know need for iron supplementation, 206(85.5%) know maternal condition risk for the fetus and 207(86.3%) said appropriate follow up can prevent disease.

Table 4 knowledge towards ANC of pregnant mother attending ANC in Public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022

Variable		Frequency	Percentage
Importance of ANC for mother	Yes	217	90.4
	No	23	9.6
Importance of ANC for fetus	Yes	224	90.3
	No	16	6.7
Appropriate time to begin ANC <12 weeks	Yes	100	41.7
	No	140	58.3
Times of visit >8	Yes	28	11.7
	No	212	88.3
Early initiation of ANC is only for pregnant women with a history of complication	Yes	44	18.3
	No	196	81.7
Need of Iron supplementation during pregnancy	Yes	210	87.5
	No	30	12.5
Know Maternal condition risk for the fetus	Yes	206	85.8
	No	34	14.2
Appropriate visit can prevent disease	Yes	207	86.3
	No	33	13.8

5.5 Other factors related with timely initiation of ANC

HIV testing didn't prevent most 234 (97.5%) mothers from attending ANC. Around 100(41.7%) mother were motivated by health provider and 194(80.8%) of their husbands had positive attitude towards ANC. Long waiting time prevented 41.7% of mothers from attending ANC.

Community influence didn't prevent 198 (82.2%) mothers from attending ANC from those who were influenced 26(7.1%) reported that misconception on ANC affected their attendance on ANC.

Table 5 Others factors related with timely initiation of ANC among pregnant mother attending ANC in Public health facilities in Enamorena Ener Woreda, Gurage zone, southern Ethiopia 2022

Variable		Frequency	Percentage
HIV testing prevent you from attending ANC	Yes	6	2.5
	No	234	97.5
Who motivated you to book Anc?	Husband/spouse	84	35
	Friend	25	10.4
	Media	22	9.2
	Health provider	100	41.7
	Other	9	3.8
Husbands attitude towards ANC	Supportive	194	80.8
	Not supportive	46	19.2
Factors prevent you from attending ANC	Distance to health facility	73	30.4
	Long awaiting time	100	41.7
	Negative attitude of health provider	44	18.3
	Lack of privacy	13	5.4
	Other	10	4.2
Are there community influences that prevent you from attending ANC?	Yes	42	17.4
	No	198	82.2
Community influence that stops you from ANC	Misconceptions on ANC	26	7.1
	Value attached to ANC	12	5
	Other	4	1.7

5.6 Factor associated with timely initiation of ANC

The results of bivariable analysis revealed that Age ,Residence , Occupation, educational status, Family monthly income , Distance from health facility, Number of alive children, stillbirth, Abortion ,Age of last child, , Knowledge of right time for First ANC visit ,Motivator of the mother towards ANC and presence of community influence that prevent her from attending ANC were found to be significantly associated with timely initiation of ANC.

In multivariable logistic regression: Age, Family monthly income, Knowledge of right time to begin First ANC visit and abortion are significantly associated with timely initiation of ANC. Analysis of risk factors showed that the odds of pregnant mother aged between 40 and 45 years were 7% times less likely to have timely initiation for ANC follow up than mothers with age between 15 and 19 (AOR=0.98 CI 95%, 0.34-0.99). Mother who came from family monthly income between 500 and 1000 ETB, came for first ANC 1.02 times timely than those with monthly income of less than 500ETB(AOR= 1.02 CI 95%, 1.01-11.5). Mothers who didn't informed about the timing of first ANC visit was 53% less likely (AOR=0.47, 95% CI 0.14-0.96) to initiate ANC within recommended time than their counter parts. Mothers who hadn't history of abortion were 4% times more likely to book late for ANC follow-up as compared to those who had an abortion history (AOR= 0.96, 95% CI , 0.01-0.98).

Table 6. Factor associated with timely initiation of ANC among pregnant mothers attending ANC in public health facilities In Enamorena ener woreda Gurage zoneEthiopia, 2022 GC.

variable		ANC		COR	AOR
		Timely	Lately		
Age	15-19	3	11	1	1
	20-24	16	28	2.10(1.08-3.44)	1.69(1.30-3.22)
	25-29	29	53	2.01(0.34-6.45)	1.02(2.13-3.88)
	30-34	18	36	1.83(1.14-3.27)	1.11(1.08-7.40)
	35-39	6	32	0.68(0.42-5.62)	0.43(0.26-3.15)
	40-45	4	4	3.67(2.22-4.88)	0.98(0.34-0.99) *
Residence	rural	51	85	1.90(1.07-3.35)	0.93(0.30-2.80)
	urban	25	79	1	1
Occupation	Employed	9	37	1	1
	Merchant	11	47	0.96(0.39-2.77)	0.33(0.20-26.15)
	Farmer	19	22	3.55(2.11-4.63)	1.80(0.07-11.87)
	House wife	34	55	2.54(1.17-2.92)	1.73(0.07-5.86)
	Other	3	3	4.11(1.06-6.41)	1.03(0.01-47.43)
Education level	Never been to school	37	66	2.60(1.09-6.15)	0.13(0.40-45.09)
	Primary	31	61	2.35(1.17-4.08)	0.19(0.43-2.84)
	Secondary and above	8	37	1	1
Family monthly income	<500	17	19	1	1
	500-1000	10	49	0.23(0.10-6.26)	1.02(1.01-11.5) *
	1000-2000	34	56	0.67(0.62-3.22)	1.56(0.34-3.3.1)
	>2000	15	40	0.42(0.19-3.37)	1.39 (0.36-5.94)
Distance in	<half hour	16	47	1	1

hour from health facility	Half hour -1 hour	23	77	0.88(0.12-3.35)	0.23(0.067-6.04)
	1-2 hour	27	30	2.64(1.18-2.89)	1.55(0.22-2.04)
	>2 hour	10	10	2.93(0.78-3.99)	0.78(0.08-2.34)
Knowledge of right time to begin First visit	Within 12 weeks	39	96	1	1
	After 12 weeks	37	67	1. 35(1.44-1.64)	0.47(0.04-1.96) *
No of alive children	1-3	30	60	1	1
	4-6	33	71	0.93(0.07-2.85)	0.55(0.35-11.03)
	>=7	2	6	0.66(0.29-8.67)	0.73(0.09-1.47)
Any stillbirth	Yes	2	12	1	1
	No	63	125	3.02(0.53-4.47)	1.53(0.01-8.68)
Any abortion	Yes	3	14	1	1
	No	66	121	2.54(1.16-3.98)	0.96(0.01-0.98)*
Age of last child in year	<2	6	21	1	
	2-4	43	69	2.18(0.17-2.83)	0.65(0.14-1.67)
	5-6	14	37	1.32.76(0.25-2.26)	0.37(0.19-4.05)
	>6	2	10	0.70(0.24-8.38)	0.46(0.21-16.32)
Who motivated You for Anc visit	Husband/spouse	29	55	1	1
	friend	7	18	0.73(0.51-3.62)	0.54(0.17-1.96)
	media	5	17	0.55(0.60-0.86)	0.28(0.19-3.84)
	Health provider	13	67	0.37(0.18-1.98)	0.26(0.06-2.41)
	others	5	7	1.35(0.36-9.46)	1.05(0.12-25.22)
Community influence	Yes	7	35	1	1
	No	69	129	2.67(0.26-3.79)	1.84(0.34-2.98)

Keys: *Statistically significant at p< 0.05

6. Discussion

This facility based cross sectional study identified factors that are significantly associated with timely ANC visits among pregnant women in Enamorena ener woreda, Gurage Zone ,SNNPR Ethiopia. It revealed that 68.3 % of pregnant women started their ANC follow up after 12 weeks of gestation, which is late ANC follow up initiation whereas, 31.7% initiate timely.

This study indicated that around two thirds of pregnant mother started first ANC visit after 12 weeks, despite public health facilities provide free ANC services for all pregnant women. Pregnant mothers with age category of 40-45, no history of abortion, no knowledge about right time to start first ANC visit were more likely to initiate lately. But mothers whose family monthly income between 500 and 1000 ETB started timely than those with less than 500 ETB.

The proportion of late ANC visit in this study is lower than the previous report from Ethiopia, which were 73.8% in Debre – birhan health institution(39), 78.28% in shebedino woreda , sidamo Zone , southern Ethiopia (38). The observed difference could be due to several factors, the most important factors are perhaps improvement in maternal health services and introduction of urban and rural health extension program. Geographical access to maternal health services might also factor.

On the other hand this finding nearly in line with study conducted In Bhutan which is 67 %(35), Kambata, Tembaro zone , southern Ethiopia which shows timely initiation of ANC is 31.7%(37).

Our study findings is lower than study done in Cameroon by which timely seeking of ANC is 46 %(34) and 40.2 % in Addis Ababa (68). This inconsistency might be due to difference in socio demography, knowledge of mothers about importance of Seeking first ANC visit, time gap between study periods and difference in data collection methods.

Pregnant mothers with age between 40 and 45 were 2% times less likely to book timely than those with age between 15 and 19. The study is nearly supported by study done in Tanzania (31),Kembata(37) and Gondar(67). This might be due to women in older age group are more

likely to have many children to care and many of them might have ingrained cultural biases against formal health care (66).Perhaps, they might not more informed and convincible to seek care (68).

Pregnant mothers with family monthly income between 500 and 1000 ETB 1.02 times more likely to seek ANC timely than those with less than 500 ETB. This study is supported by study conducted in public health centres in Addis Ababa(68), which showed that pregnant mother from household income <1000ETB late for ANC 82% times than those who earn >2000. Financial status determines less money to transport to health facilities to use ANC services. Another possible explanation is that women from good income have proper education and more access to mass media than their counterparts.

Mothers with no knowledge of right time to begin first ANC Visit 53% times less likely to initiate ANC timely than their counterparts. This study is supported by study conducted in Tanzania (31) and Debre birhan (38), the possible justification might be poor exposure to source of information, due to the fact that the provision of appropriate information changes health seeking behaviour of women and motivate them to visit health facility.

In this study finding, pregnant mothers who had no history of abortion were 4% times more likely to book ANC lately as compared to their counterparts. The study finding is supported by the study done in the United Arab Emirates and in Ethiopia (69,70). It could be explained by the fact that, mothers who have a history of abortion were 0.06 more likely to initiate early for ANC follow up due to fear of recurrence as well as they might get information about ANC follow up.

7. Conclusion and recommendation

7 .1 Conclusion

Late initiation of ANC is a high problem in the study area. Maternal age of 40-45, family monthly income , lack of knowledge on the right time to start first ANC, not having history of abortion were determinant factors on timing of ANC. strengthening the expansion of education on ANC, promoting health education, creating awareness, empowering women and giving appropriate advice on pregnancy and would improve late initiation for antenatal care.

7.2 Recommendations

For Gunchire primary hospital and All health centers and Community leaders in Enamorena ener woreda

-Should strengthen and maintain local information dissemination by collaborating all ANC providers at all level levels (midwives, urban health professionals and community leaders) because effective use of ANC care services by pregnant women requires efforts from the health professionals and community members.

For health care providers

-Give appropriate information on the importance of the early ANC visit need to be emphasized at the time of service provision.

Providing first ANC booking within the recommended time (within the first trimester) for the ANC visiting mothers.

7.3 Limitation of the study

This study has the same limitations as other observational studies which are based on cross sectional data. Since data on dependent and independent variables was collected at the same point in time, no causal interpretation can be made of the relationships between variables. The data are based on self-reports from women, which may be subject to recall biases. This study was carried out in public health institutions; pregnant women who attend antenatal care at private health facilities were not included in the study. Moreover, gestational age was determined based on women's reports of their last menstrual period (LNMP). Ultrasound scan to confirm gestational age was not performed; hence, this may have caused inaccuracies

in measurement of gestational age. Moreover, this is a facility based cross-sectional study whose findings are not generalized to a general population, rural community.

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English Version Questionnaire

Dear Respondents:

This questionnaire is prepared "**to assess Timely initiation of antenatal care visit and associated factors among pregnant mothers attending antenatal care in Enamorena Ener Woreda, Gurage zone, Ethiopia, 2022.**"

The assessment will be made as partial fulfillment for the requirements of Degree of Bachelor of Science in Public Health for the principal investigators. The questionnaire will take only about 15 minutes to complete. You are kindly requested to provide genuine response to the questions.

The information you provide is confidential and used only for the purpose of this study. If you have any confusion or question, please don't hesitate to ask the data collector.

Your cooperation and participation until the completion of the questionnaire is very crucial for the successful completion of the assessment.

Thank you in advance for your cooperation!!!

Questionnaire code: _____

Data collection date: _____

Data collector's name and signature: _____ _____

Supervisor's Name and signature: _____ _____

Wolkite, Ethiopia

July 202

Part -1 Socio Demographic Related Questions			
S/no	Questions	Response/Alternative	Comment
101	Age	_____(in years)	
102	Religion	1. Orthodox 2. Muslim 3.Protestant 4.Catholic	
103	Ethnicity	1.Gurage 2.Kebena 3.Amhara 4.Other	
104	Place of residence	1.Rural 2.Urban	
105	Marital Status	1.Married 2. other	
106	Employment Status	1.Employed 2.Merchant 3.Farmer 4.House wife 5.Other	
107	Mother Educational status	1.Never been to School 2.Primary 3.Secondary	
108	Family Monthly Income	1.<500 2.500-1000 3.1000-2000 4.>2000	
109	Distance in hour from home to health facility for	1.< Half hour 2.Half hour -1hour 3.1-2 hour	

	pedestrian	4.> 2 hour	

Part-2 obstetric History			
201	Gravidity	1.primigravid 2.Multigravid	
If yes for question number 201 answer question #201,202,203,204,205,206,207			
202	Parity	1.Primiparous 2. Multiparous	
203	No of alive children	……..	
204	Any still birth	1.Yes 2.No	
205	Any abortion	1.Yes 2.No	
206	Other complication in pregnancy	1.Yes 2.No	
	Age of last child	……In years	
207	Had ANC for the last child	1.Yes 2.No	
If yes for question #207 answer 208			
208	How old was your pregnancy when you made your first ANC visit	1.≤12weeks 2.>12 weeks	
209	Any history of cesarean section	1.Yes 2.No	
210	Was the pregnancy planned	1.Yes 2.No	
211	Is Current pregnancy planned	1.Yes 2.No	
212	Month of first ANC visit for the current pregnancy	……in months	
213	How many ANC visit did you have for this current pregnancy		

Part 3 Questions related to pregnant mothers knowledge towards ANC

		Yes	No
301	Do you think ANC is importance for maternal health?		
302	Do you think ANC is importance for fetus?		
303	Do you think the appropriate time to begin ANC after conception is<12weeks?		
304	Do you think a woman needs to go for ANC > 8 times?		
305	Do you think a pregnant mother need to initiate ANC early only if she had complication in her previous pregnancy?		
306	Do you think pregnant mother needs iron supplementation during her pregnancy?		
307	Do you know maternal conditions risk for the fetus		
308	.Do you think appropriate ANC follow up can prevent disease		
309	Do you know about erythroblastosis fetalis		
	If yes answer question #310		
	310. Do you think appropriate ANC follow up can prevent erythroblastosis fetalis		

4.Other factors related with not initiating ANC timely			
401	Would being tested for HIV prevent you from attending ANC	1.Yes 2.No	
402	Who motivated you to book for ANC?	1.Husband/spouse 2. Friend 3. Media 4. Health provider 5. Others (specify) ……..	
403	What was/is your husband's	1.Supportive	

	attitude towards ANC?	2. Not supportive	
404	Which of the following factors do you think could prevent you from attending ANC early?	1. Distance to health facility 2. Long waiting time 3. Negative attitude of health providers 4. Lack of privacy 5.Other(specify)…… ……	
405	Is there community influence that stop you from attending ANC	1. Yes 2. No	
If yes answer question #406			
406	What community influence could stop you attending ANC	1. Misconceptions on ANC 2. Value attached to ANC 3.Other (specify)	

THANK YOU FOR YOUR PARTICIPATION