Assessment of Timely Initiation of First ANC Visit and Associated Factors among Pregnant Mothers in Wolayita Soddo Public Health Facilities, Soddo Town, Wollayita Zone, SNNPR, Ethiopia,

Maycas Dembelu, Abigia Samuel, Kostir Andarge,
Samuel Tamirat and Mekonnen Kolcha, Arba Minch University

Abstract

Antenatal care is a health care service which is given to pregnant women and is widely used for prevention, early diagnosis and treatment of general medical and pregnancy related complications. However, late antenatal attendance makes it difficult to implement effectively the routine antenatal care strategies that enhance maternal wellbeing and good prenatal outcomes.

The objective of this study is to assess the magnitude of timely initiation of first ante natal care visit and associated factors among pregnant women attending ante natal care visit at Wolayita Soddo town health institution.

Health institution-based cross sectional study was conducted among 255 pregnant mothers in Wolayita Soddo town from May 22 up to June 6, 2016.Systematic sampling technique was used. Data was collected using pre tested and interviewer administered structured questioner. Bivariate and multivariate logistic regression analysis was used to determine independent predictors using SPSS version 20.0 statistical software.

Out of 255 pregnant mothers included in this study, 99 (39%) pregnant mothers started their first ANC visit early. In both cases, the timing of the first ANC booking ranged from 3 weeks to 32 weeks of gestation with mean timing of 17 weeks with standard deviation of 5.3 weeks. Multivariate analysis revealed that respondents with the educational level of secondary school (AOR=6.25, 95%CI; 2.16, 18.06), who had knowledge on the importance of ANC(AOR=5.51, 95% CI, 1.28-23.67), early recognition of pregnancy (AOR=3.53, 95%CI;(1.22, 10.21) and those with no previous history of parity(AOR= 2.5, 95%CI, 1.6-4.8) were significantly and independently associated timely initiation of first antenatal care visit.

The findings of this study indicated that (99) 39 % were booked timely. Thus, women's educational status, knowledge of women on importance of timely booking, early recognition of pregnancy and those with parity zero were found to be important determinant of timely initiation of first antenatal care visit. Empowering pregnant women with education, adequate knowledge, frequent follow up of those with previous history pregnancy as well as early testing of pregnancy has to be considered when antenatal care programs are planned, implemented and evaluated to ensure timely booking of first ANC.

Key words: *Antenatal Care, Timely Initiation, Pregnant Women, Wolayita Soddo Town*

1. Introduction

1.1 Background

While motherhood is often a positive and fulfilling experience, for many women it is associated with suffering, ill-health and even death. According to the 2013 estimation there were 289000 maternal deaths worldwide. More than half of these deaths occurred in sub-Saharan Africa, which is nearly 62 % (179,000) of worldwide maternal deaths (1). In Ethiopia, maternal mortality and morbidity levels are among the highest in the world. The

Maternal Mortality Ratio (MMR) in the year 2011 was 676 per 100,000 live births (2), but this number reduced to 426 per 100,000 in EDHS 2014 report (3). From the interventions used to reduce maternal mortality one is ANC (ante natal care) service. Data found from EDHS 2014 showed that only 41 % of pregnant women receive ANC from skilled provider (3).

The antenatal period provides excellent opportunities to reach pregnant women with preventive and curative care. It is revealed that, the higher the level of care obtained during pregnancy, the higher the use of safe delivery service will be. This strong positive association between level of care obtained during pregnancy and the use of safe delivery care might help explain why ANC could also be associated with reduced maternal mortality (4).

ANC is a health care, which is given to pregnant women, is widely used for prevention, early diagnosis and treatment of general medical and pregnancy related complications. The utilization of ANC has been shown to predict several birth outcomes and a number of postpartum practices. The new World Health Organization (WHO) ANC model states that every pregnant woman is at risk of complications and recommends early ANC visit. The visit is used to segregate pregnant women into 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 especial care based on their specific health conditions or risk factors on average account for 25% of all pregnant women initiating ANC (5).

Early initiating ANC has many benefits. For instance, first comprehensive health assessments including maternal baselines data such as weight, blood pressure and urinalysis will be assessed. Pregnant women will be informed about how to recognize and respond to the signs of obstetric complications as they may have little knowledge and experience in reproductive health and tetanus toxoid immunization which is lifesaving both for the mother and infant will be initiated early. Birth preparedness and complication readiness plan will be arranged and counseling on the importance of iodized salt consumption will be offered. Supplementation of pregnant women, who are at risk of nutritional deficiency with folic acid up to 12 weeks of gestation, reduces the risk of having a baby with neural tube defects such as anencephaly and spinal bifida. More, treatment of malaria, anemia, Sexual transmitted infections and prevention of mother to child transmission of HIV/AIDS can be addressed if early ANC initiations made (6).

Other interventions that can be linked to ANC include providing information on good nutrition, family planning, breastfeeding, and health benefits of delivery with the assistance of skilled health provider. Prevention of mother to child transmission of HIV (PMTCT) has recently been incorporated in the antenatal care service program. Hence early antenatal care booking is a strong predictor of positive pregnancy outcomes, and has a substantial impact on maternal and Child mortality (6, 7).

1.2 Statement of the Problem

In 2013, approximately 289,000 women died during and following pregnancy and childbirth globally. A large majority of these deaths are preventable with three-quarters directly associated to obstetric complications such as hemorrhage, infections, pregnancy induced hypertension. Almost all of these deaths (99%) occur in low-income countries (8).

Despite this recommendation from WHO, a non-negligible number of women in Sub Sahara Africa do not attend ANC services (9).

More recent Demographic and Health Survey (DHS) data illustrate that the variation in timing of ANC initiation across sub-Saharan Africa remains notable: for example, 11% of women started ANC in the first trimester in Ethiopia (2011); 16% in Nigeria (2008); 47% in Congo-Brazzaville (2005) and 55% in Ghana (2008). Moreover, amongst sub-Saharan African countries, the trend over the last 10 to 20 years in the proportion of women making at least four ANC visits varies markedly (10).

According to the 2011 Ethiopia Demographic Health Survey, 19% of women with a live birth in the five years before the survey made four or more ANC visits during their recent pregnancy, while only 11% made their first ANC visit before the fourth month of pregnancy. The median duration of pregnancy at the first visit was 5.2 months (11).

Although there is limited evidence, late booking of antenatal care has been associated with young age, premarital status, unwanted pregnancies, high parity, and lack of formal education, low socioeconomic status, and ethnicity. The quality of antenatal care might have an influence on utilization of antenatal care, leading to infrequent or late first visits to antenatal care (12).

When women initiate ANC late, they have an increased risk of poor pregnancy outcomes, maternal and neonatal mortality. Consequently, pregnant women are missing the intended benefits of ANC which include early identification and management of pre-existing health conditions and complications of pregnancy to prevent life-threatening maternal and neonatal condition. Thus, late antenatal attendance makes difficult to implement effectively the routine ANC strategies that enhance maternal wellbeing and good prenatal outcomes (12, 13).

Late initiation of ANC may lead to undetected or late detection of maternal health problems and subsequently unmanaged complication among pregnant women and thus contributes to maternal mortality (13).

Recently, the potential of the antenatal period as an entry point for HIV/AIDS prevention and care, in particular for the prevention of HIV transmission from mother to child, has led to renewed interest in access to and use of ANC services. Additionally, WHO recommends that all pregnant women in areas of stable malaria transmission should receive at least two doses of Intermittent Presumptive? Thus, late antenatal attendance makes it difficult to implement effectively the above and other routine ANC strategies that enhance maternal wellbeing and good prenatal outcomes (13, 14).

Delayed entry into antenatal care may result in missed opportunities to diagnose pregnancy induced hypertension, gestational diabetes, or sexually transmitted infections. However, use of these maternal health services is limited, especially in developing countries with high maternal and child mortality (14).

It is very likely that a good number of women will not initiate ANC early enough in pregnancy to follow the full basic component of the Focused ANC in Ethiopia. Late ANC initiation may increase the total cost of caring for a pregnant woman. A cost which arises from missed opportunities to prevent or treat problems early in pregnancy (15).

Studies demonstrating the high levels of maternal mortality and morbidity in developing countries and research identifying causes of maternal deaths have repeatedly emphasized the

need for timely initiation of antenatal care, which have a direct relation with good prenatal outcome. So, various studies identified that timely initiation of ANC has significant benefit for the mother and unborn fetus, and leads to delivery of healthy baby (16-19).

As far as our knowledge is concerned, the studies related to the magnitude of early ANC visit and associated factors are unavailable in the study area. Therefore, this study aimed at giving information about the magnitude of early ANC visit and associated factors in order to help improve the health of mothers and their fetus. The study thus set out to assess the magnitude of early ANC visit and associated factors among pregnant women attending ANC in Wolayita Soddo town, Ethiopia.

1.3. Significance of the Study

The study is aimed to assess the magnitude of timely initiation of first antenatal visits in Wolayita Soddo town by mentioning the various factors related to the utilization of this service. Therefore, the result is expected that it will enable the targeting of ANC service to improve maternal and infant health specially to increase maternal early entry into ANC in Wolayita Soddo town.

This study serves as an input for governmental and non-governmental organizations in order to intervene on problems related to ante natal care utilization. Additionally, this research will serve a raw material for allocation of resources as well as policy decision directed towards effective utilization of ANC. Finally, this research may be used by other investigators as a baseline for further research on the subject.

1.4. Objectives

1.4.1. General objective

- To assess the magnitude of timely initiation of first ante natal care and its associated factor in Wolayita Soddo town, from May 22, 2016 to June 6, 2016.

1.4.2. Specific objectives

- To determine the magnitude of timely initiation of first ante natal care visits.
- To identify associated factors for timely initiation of first ante natal care visits.

2. Methods and Materials

2.1. Study area and period

Wolayita Soddo is a town in south central Ethiopia and is the administrative center of Wolayita zone of Southern Nations, Nationalities and Peoples (SNNP) Region. It is 380 km away from Addis Ababa and 170 km far from the regional capital Hawassa.Wolayita Soddo has an altitude between 1600 and 2100m above sea level (6°54'N, 37°45'E 6.900°N, 37.75°E). Soddo possess well moderate subtropical highland climate. The area has annual rain fall of 1212m and 20°c mean monthly temperature. Based on the 2007 census conducted by Central Statistics Agency Wolayita has a total population of 1, 501, 112, of whom 739,533 are men and761, 579women. While 172,514 live in the town.Wollayitigna is spoken as a first language by 96.82% of the inhabitants. Regarding health institutions, the town has one governmental referral hospital, one private hospital, three health centers, seven health posts and therty private clinics. This study was conducted from May22 up to June 6, 2016.

2.2. Study Design

Institutional-based **cross-sectional study** was conducted.

2.3. Source Population

The source populations were all pregnant mothers who come to attend ANC at all health institution found in Wolayita Soddo town.

2.4. Study Population

The study populations were all pregnant mothers who follow antenatal care in the selected health institution during the study period.

2.4.1. Study Unit

The estimated study units were 256 pregnant women attending ANC at selected health institution.

2.5. Inclusion and Exclusion Criteria

Inclusion Criteria

- All pregnant women who are attending ANC visit were included in the study that has possible inclusive (socio-demographic, obstetric and other) characteristics.

Exclusion Criteria

- Pregnant mothers who came to health institution for other reason.
- Pregnant women with mental problem, and
- Pregnant women who were seriously ill

2.6. Sample Size Determination

Sample size for the study calculated based on single population proportion formula [$n= (Z\alpha/2)^2 p\ (1-p)/d^2$] were used to estimate the sample size, with the following assumptions. Based on findings from previous studies, the proportion of women who start ante natal care before 16 weeks was found to be 35% (4), 95% confidential interval, with margin of error 5% (d=0.05) and expected non-response rate of 10%. Computing with the formula gives a total sample size of 350.

Formula, $n= (Z\alpha/2)^2 p\ (1-p)/d^2$, where

$n= (1.96)^2\ (0.35)\ (0.65)/\ (0.05)^2=350$

Where; n=the required sample size

p=prevalence of timely initiation of ANC

z=the value of the standard normal curve score correspond to the given confidence interval 1.96

d=margin of error

By using population correction formula, n= n/1+n/N

n_f=350/1+ (350/600) =233.

Where; n=sample size

n_f=corrected sample size

N=number of women in study unit.

And by adding 10% of non-response rate, total of 256 pregnant women were used as study unit during the study period at the selected health institutions in Wolayita Soddo town.

2.7. Sampling Procedure and Technique

Among public health institutions found in Soddo town, we selected public health facilities that provide ANC service and which were willing to cooperate in the research work. Soddo Referral Hospital, Christian Hospital, Soddo Health Center, Geneme Health center and Wadu health center were included based on their client flow. Then the total sample size 256 were distributed to each of the health institutions based on their proportion of performance of the previous month, probability sampling were used; Systematic sampling method with k^{th} interval (i.e. k=N/n),k=600/256=2.34= every other interval, we selected number 1 of ANC visitors randomly and started data collection. After that pregnant women were recruited as a study unit with specified interval until the total sample size for this study will be obtained.

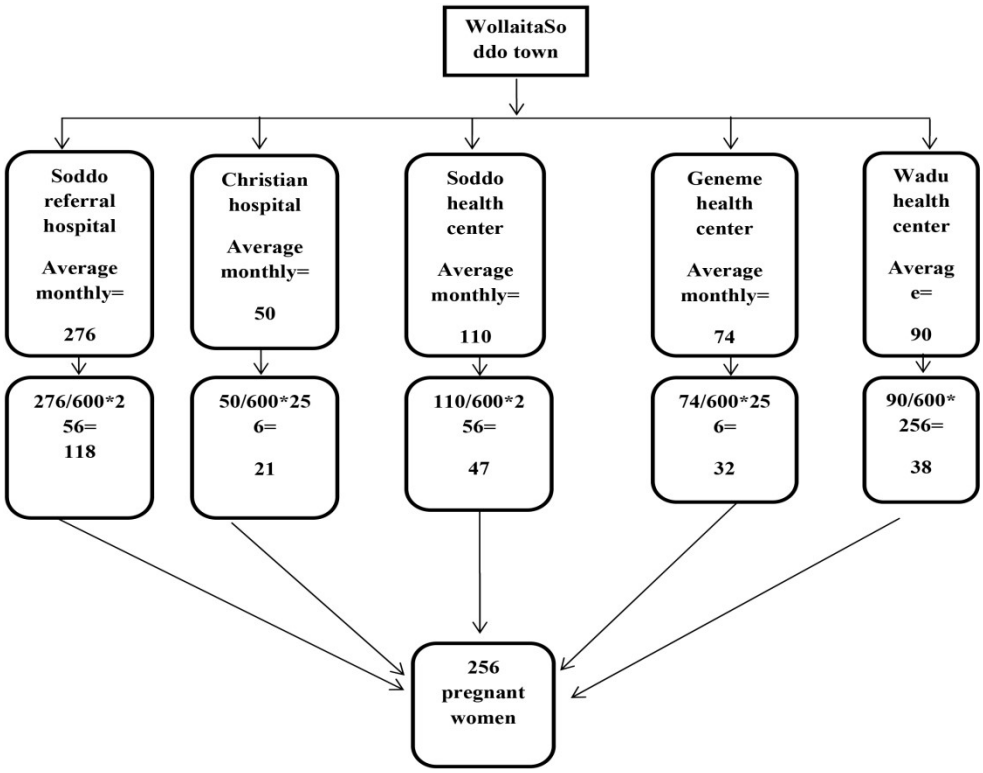


Figure 1: schematic representation of sampling techniques used for selecting the study unit in Wolayita Soddo town, SNNPR, May 2016

2.8. Study Variables

2.8.1. Dependent Variable

- Timely initiation of first ANC visit.

2.8.2. Independent Variables

- Socio-demographic variable: age, marital status, religion, ethnicity, women's educational status, occupation of respondents, household income.
- Obstetric variables: parity, no. of live births, history of abortion, history of still births, have knowledge on time of first ANC,planned pregnancy, means of approving pregnancy, and past experience; previous utilization of service, cost of maternal services.

2.9. Operational Definition

Ante Natal Care (ANC): ANC is a care which is given for a pregnant woman and her unborn baby starting from where she knows being pregnant.

Timely initiation of first ANC – booking first ANC within recommended time (around or preferably before fourth month of Pregnancy).

Late ANC visit: Refers to pregnancy-related care received from a skilled health care professional but initiated after 16 weeks of gestation.

Knowledge on ANC- implies that women are seen as well informed and that they responded to timing of first ANC visit correctly in accordance to WHO recommendation. Those who respond to 3 and above questions were correctly considered as knowledgeable, but those who answered 2 and below were not considered as knowledgeable.

2.10. Data Collection Tools

After reviewing of the relevant literature, the data collection tools were developed, as deemed appropriate to address the study objectives. The final version of the questionnaire was developed by translating the English into Amharic; then, the final or the agreed Amharic version of the questioner was translated back into English with the first to check for any inconsistency or distortion in the meaning of words in the content of the instrument. Five % of total sample respondents were interviewed during the pretest in another health institution. After this, the questionnaires were edited accordingly; and finally, the instrument had incorporated socio demographic characteristics, obstetric history, health services utilization, and knowledge related to timely initiation of first ANC visit. The questioner consisted of open-ended, partially closed and closed-ended. After adapting the final version of the questionnaire, face to face interview was conducted to collect data by using the Amharic version questionnaire from May 22 to June 6, 2016.

2.11. Data Collection Process

The data was collected by selected data collectors during the data collection. Midwife health professionals helped in translating the local language into the working language. Our advisers and volunteer instructors were supervising us during the pretest and the actual data collection process. All the group member students were also discussing on the relevance of the data during the collection process.

2.12. Data Analysis

The completeness and consistency of the data were checked, coded and entered into the Statistical Package of Social Science (SPSS) version 20 software for analysis. Descriptive

and summary statistics were carried out. Bivariate and multivariable logistic regression analyses were used to identify variables associated with early ANC visit. The statistical significance and strength of the association between independent variables and an outcome variable were measured by bivariate logistic regression model. From this value less than 0.25 was transferred to multiple logistic regression models to adjust for confounder's effects, and those variables with p-value<0.05 were considered as significantly associated in the final model. The crude and adjusted odd ratios together with their corresponding 95% confidence intervals were computed and interpreted accordingly. Finally, the results of the study were presented using tables, figures and texts based on the data obtained.

2.13. Quality Control

To increase the quality of data, the questionnaire was tested in another health institution prior to the actual data collection. Based on the finding of the pre-test, data collection tools were reoriented and the questionnaire was modified as necessary. The data collection tools were checked for the appropriateness and completeness by the advisors and we were supervised during the data collection procedure. All the data were cleaned, and cross-checked for their completeness before analysis.

2.14. Ethical Consideration

A letter of clearance was obtained from AMU, College of Medicine and Health Science, Department of Nursing. The letter handed to Wolayita Zone Health Bureau, the study area health institutions and other concerned bodies. A letter of approval was received from Wolayita Zone Health Bureau. Data was collected after explaining the rights and responsibilities of giving information and the purpose of the study to respondents and ascertaining their confidentiality by explaining that no data will be disclosed as an individual rather disseminated at community and health institution level in general. Finally informed consent was obtained from respondents after telling them that they have the right not to respond.

2.15. Plan for Dissemination of the Result

The result of this study will be disseminated to AMU, College of Medicine and Health Science library, Wolayita Zone Health Bureau, Wolayita Soddo town Health Bureau governmental and private health institutions found in Wolayita Soddo town, and to individual investigators who want to use the study results.

3. Result

Socio Demographic Characteristics of Respondents

Among pregnant women attending ante natal care, 256 women were initiated to be included in this study; two hundred fifty five (99%) women were responded to the interview.

Majority of women 154 (60.4) involved in the study were age in between 21-34; the remaining 80 (31.4%) and 21 (8.2) of them were in the category of both lower and upper age extremes respectively. The mean age of respondents was 28.2 years (±3.6SD).

The ethnic composition of the respondents was found to be Wolayita 223 (87.4%), Gamo 16 (6.2%), Gurage (3.5%). Others (2.9%). Respondents of protestant religion were found to be 161 (63.1%), followed by orthodox 60 (23.5%), catholic 21 (8.2%) and muslim 13 (5.2%).Majority 239 (93.7%) of the respondents were married. The majority of educational statuses of most respondents' were Secondary school 82(32%). Over three in five

163(64.8%) of the respondents are housewives, and the remaining 91.8(36 %) employed either self, in government, private or NGOs.

The socio-demographic characteristics of the women and their partners are described in table 1 below.

Table 1: Socio-demographic Characteristics of Pregnant Women Attending ANC Services at Wolayita Soddo Town health Institutions, Ethiopia, May 2016

Characteristics (variable)n=255		Number	Percent
Age of respondent's at time of study	≤20 years	80	31.4%
	21-34 years	154	60.4%
	≥35years	21	8.2%
Ethnicity of respondents	Wolayita	223	87.4%
	Gamo	16	6.2%
	Gurage	9	3.5%
	Others*	7	2.9%
Religion of respondents	Protestant	161	63.1%
	Orthodox	60	23.5%
	Catholic	21	8.2%
	Muslim	13	5.2%
Marital status	Single	14	5.5%
	Married	239	93.7
	Others**	2	0.8%
Educational level of respondent	No formal education	16	6.3%
	Primary school(1-8)	58	22.7%
	Secondary school(9-12	100	39.2%
	Diploma and above	81	31.8%
Occupation of the respondent	house wife	163	64.8%
	Employed	56	22%
	Daily labor	19	7.5%
	Other***	17	5.7%
Husband's educational status	No formal education	5	2%
	Primary school(1-8)	59	23.1%
	Secondary school(9-12	144	56.5%
	Diploma and above	47	18.4%
Family income	≤500 ETB	27	10.6
	501-1000 ETB	137	53.6%
	>1000 ETB	91	35.7%

N.B, others*=Hadiya, Amhara, others **= separated, widowed, divorced, other***=students, waiters

A. Timing of First ANC Visit

The proportion of respondents who made their first ANC before or at 16 weeks of gestation (within WHO recommended time for developing countries) are 99(39%), the rest 156(61%) of the respondents commenced ANC service late (after 16 weeks of gestation).In general, the timing of first ANC visit ranges from 3rdto 32thweeks of gestation. The mean timing for first ANC visit was 17 weeks (SD±5.3).

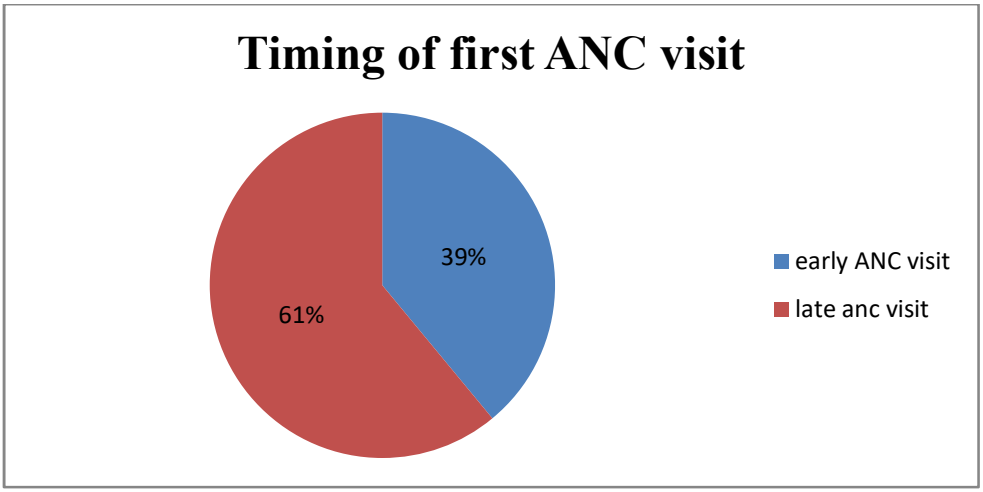


Figure 2: First ANC Timing in weeks of gestation for pregnant women attending ANC service in Wolayita Soddo town health institution

B. Obstetric History

One hundred seventeen (45.8%) of respondents were parity zero. Eighteen (7%) have had a history of abortion. Of these women who have had history of abortion, 8 (46%) were spontaneous, and about 10 (54%) were induced abortion. Nine (3.5%) had a history of at least one child death and 6 (2.4%) have had history of at least one still birth. 19 (7.5%) have history of caesarean section (C/S) delivery but the remaining 236 (92.5%) have no any operational delivery.

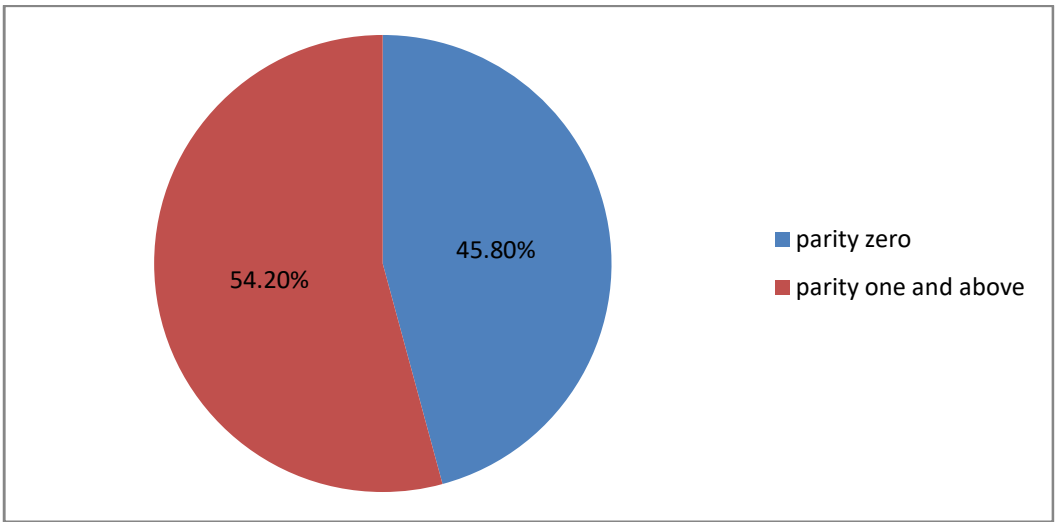


Figure 3: pie chart depicting number of pregnancies for respondents attending ANC service in Wolayita Soddo town health institution

C. Knowledge of ANC Service Utilization and Timing of First ANC Visit

Two hundred forty four (96%) of respondents rated that ANC is highly important for the health of the mother .235 (92%) of respondents rated that ANC visit is highly important for the fetus. The remaining proportion reported that, its importance is medium both for the

mother and fetus. No one complained as the importance is less or no importance for the mother, fetus or both.

Table 2: Knowledge about importance of ANC visit for both the mother and the fetus in Wolayita, SNNPR, and May 2016

Variable	Highly important		Medium		Less		Do not know	
Knowledge about first ANC visit	N	%	N	%	N	%	N	%
1.How do you rate importance of ANC for your health	244	96%	11	4.3%	-	-	-	-
2.How do you rate importance of ANC for the fetus	235	92%	20	7.8%	-	-	-	-

Two hundred nineteen (85.8%) of the respondents reported that a woman needs to attend ANC services four or more times under normal circumstances, but the remaining 36(14.2%) thought three or less times. Knowledge related to timing of first ANC visit also presented in the figure below.

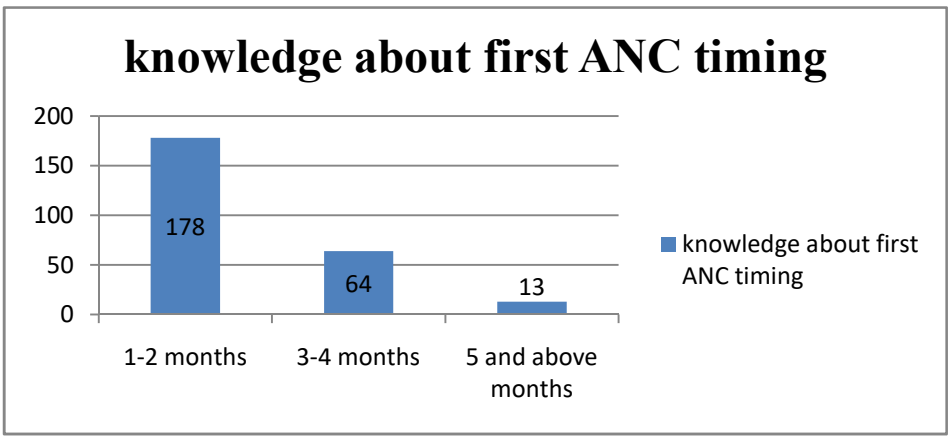
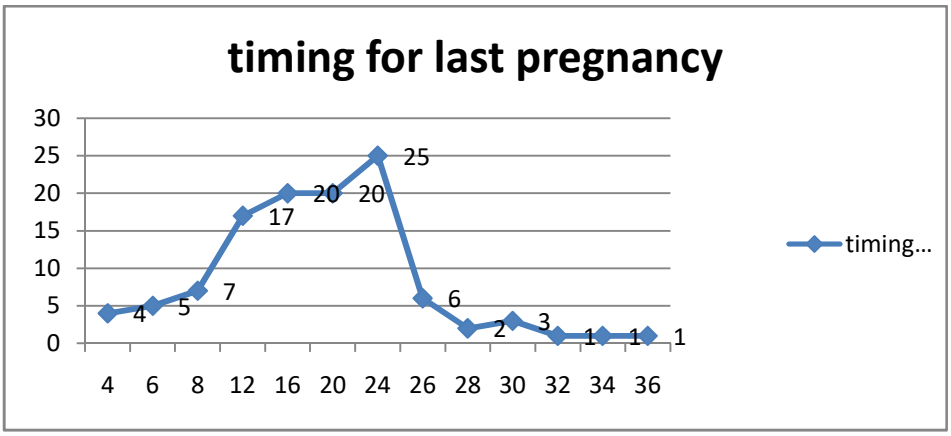


Figure 4: Bar graph showing knowledge about first ANC timing in Wolayita Soddo town, SNNPR May 2016

D. Past History of ANC Service Utilization

One hundred twelve (43.9%), have a history of attending ANC service, 143 (56%) have not. Out of 112, 69 (61.6%) started with in the first four month of pregnancy; while 43 (38.4%) started after16th weeks of gestation (see graph below).



Time of first ANC service for recent (last) pregnancy (wks)

Figure 5: Time at which the Pregnant Women Started ANC Service for the Recent (last) Pregnancy in Weeks

E. Previous Service Utilization

For the previous ANC service utilization, the median waiting time for the first visit was one and half hours and forty minutes for the repeat visit.

Majority of the respondents required no payment, except for laboratory and drug which are estimated to be 95 (85%), and 86 (77%) respectively. Out of 112 pregnant women who follow previous ANC visit, majority 108 (96.4) did not complain missed investigation.

Of all 112 who had ever attended ANC service, majority of the respondents 110 (98.2%) reported that they were satisfied with the staff approach. Additionally the satisfaction rate for charge of service, privacy, waiting time and laboratory service were 98.9%,98.1%,95%, and 97.6% respectively with different degree of satisfaction from highly satisfied to medium.

F. History of Current Pregnancy

The mean time of pregnancy was 17 weeks ranging from 3 to 32 weeks. Over one in four 61 (23.9%) of the respondents were informed by their husbands. Only 33 (12.9%) has been informed when to start ANC.

Table 3: History of current pregnancy and Timing of first ANC visit of gestation for pregnant women attending ANC service at selected health institutions in Wolayita Soddo town, Ethiopia, May 2016

Variables		Frequency	Percent
Time(duration) of pregnancy in weeks	≤20 weeks	115	45.1%
	21-34 weeks	130	50.9%
	≥35 weeks	10	4%
Timing of first ANC visit(weeks)	≤16 weeks	99	38.8%
	>16 weeks	156	61.2%
Someone who inform them about ANC use	Health extension workers	56	21.9%
	Husband	61	23.9%
	Mother	77	30.2%
	Sister neighbor	24	9.4%
	Neighbor	10	3.9%
	Friends	15	5.9%
	Others**	12	4.8%

Others**=radio, television

Table 4: Medical conditions (problems) the pregnant women experienced in current pregnancy, at selected Public health institution in Wolayita Soddo, Ethiopia, 2016

Medical condition	Frequency	Percent
Malaria	57	47.5%
Typhoid	36	30%
DM	4	3.3%
UTI	16	13.3%
Hypertension	7	5.9%
Total	120	100%

Sixty seven (26.2%) of the respondents reported that they have identified their pregnancy when they missed period once while the others106 (41.6%) alerted their pregnancy when they missed menses for more than one times. Likewise, 82(32.1%) of the respondents are confirmed by urine test.

Table 5: Method of identification of Pregnancy by Pregnant Women Attending Public Health Institution in Wolayita Soddo Town, Ethiopia, May 2016

Variable	Frequency	Percent
Missed period once	67	26.2%
Missed period twice	49	19.2%
Missed period three and more	40	15.7%
Physiological changes	17	6.8%
Urine test	82	32.1%
Total	255	100%

Out of two hundred fifty five pregnant women, 116 (45.5%) of pregnancies were planned, out of this 88 (75.8%) of the plan were in agreement with the husband.

G. Association of Respondent's Socio-demographic Factors by Timing of First ANC Booking

Analyses of socio-demographic variables on binary logistic regression showed that respondents age 35 and above were less likely to book timely visits as compared to the referents. The findings show that those with secondary school, house-wife respondents, those who earn greater than five hundred (500 ETB) per month were significantly associated with timely initiation of first ANC visit.

On the other hand, the variables marital status was not significantly associated with early initiation of first ANC.

Table 6: Association of Socio-demographic Factors by Timing of First ANC Booking in Wolayita Soddo Town, SNNPR, May 2016

Variable		Booked timely	Booked Lately	Crude OR 95%CI
		Frequency	Frequency	
Age	<20 years	31(37.3%)	49(29%)	1.64(0.2- 30)
	20-34 years	47(56.6%)	103(63.3%)	1.19(1.11, 2.6)***
	≥35years	5(6%)	13(7.7%)	1
Marital status	single	5(0.02)	9(0.04)	1
	married	92(0.36)	147(0.57)	1.13(0.7,8.2)
	others	1(0.004)	1(0.004)	1.8(0.98,13)
occupation	House wife	52(20.4%)	111(43.5%)	1
	Employed	14(5.5%)	42(16.4%)	0.71(0.33-4.2)
	Daily labor	5(1.9%)	14(5.5%)	0.8(0.2, 3.6)
	Others	8((3.1%)	9(3.7%)	1.9(0.7-4.8)
Women educational level	No formal education	7(2.7%)	9(3.5%)	1
	Primary school(1-8)	17(6.6%)	41(16%)	2.49[1.74, 8.4)***
	Secondary school(9-12)	32(12.5%)	49(19.5%)	2.09(1.3, 4.83)**
	Tertiary education (diploma and above)	29(11.4%)	71(27.8%)	1.31(0.57, 3)
Family income	≤ 500 ETB	30(11.7%)	61(23.9%)	1
	501-1000ETB	45(17.6%)	92(36.0%)	1.0(0.58-3.9)
	>1000 ETB	7(2.7%)	20(8.1%)	0.7(0.5-2.2)

NB: *1=reference category*=p-value <0.01, **=p-value <0.05, ***=p-value <0.25,*

H. Association of Respondent's Obstetric History by Timing of First Antenatal Care Booking

Bivariate analysis showed that respondents who have knowledge on timely initiation, women with parity zero, who were advised to initiate early, those who recognized their pregnancy early initiate ANC visit early than their counterparts. The detail of binary logistic regression of timing of first ANC visit is presented in table below.

Table 11: Association of Respondents' Obstetric History by Timing of First Antenatal Care Booking in Wolayita Soddo Town, SNNPR, May 2016

Obstetric characteristics		Booked timely	Booked lately	COR 95% CI
		Frequency	Frequency	
Pregnancy initiation	Planned	66(25.8%)	131(51.3%)	1.03(0.53, 6.32)
	Unplanned	19(7.5%)	39(15.4%)	1
Knowledge on timely initiation	Yes	76(29.8%)	132(51.8%)	3.02(1.4, 9.13)**
	No	4(1.6%)	21(16.8%)	1
History of abortion	Yes	11(4.3%)	17(6.7%)	1.33(0.8, 9.72)
	No	74(29.0%)	153(60%)	1
Recognition of pregnancy	1-4 months	72(28.2%)	106(41.6%)	3.55(1.64, 7.69)*
	5 and above	9(3.5%)	47(26.7%)	1
Parity	Zero	61(23.9%)	56(21.9%)	3.60(1.642, 13.454)**
	One and above	32(12.5%)	106(41.7%)	1
Advised to initiate ANC early	Yes	54(64.3)	90(52.9)	1.6(1.2, 2.74)***
	No	30(35.7)	80(47.1)	1

NB: *1=reference category, *=p-value <0.01, **=p-value <0.05, ***=p-value <0.25,*

I. Selected Factors Associated with Timing of First ANC Booking

A multivariate analysis was done to identify independent predictors of timing of first antenatal care booking. As a result, analysis revealed that respondents' education, parity, knowledge on timely booking and early recognition of pregnancy were shown to have significant association with timing of first ANC booking after controlling for confounding factors.

The study findings reveal that respondents with secondary school education were more likely to book timely as compared to those with no formal education (AOR=6.25, 95% CI; 2.16, 18.06, P<0.01), those wth primary education are 1.6 times more likely to start than those with no formal education but not found to be significantly associated with early initiation of ANC visit. Also respondents who have knowledge timely initiation were more likely to book first ANC within recommended time as compared to their counterparts (AOR=5.51, 95% CI, 1.28-23.67, p<0.05). The analysis showed that respondents with parity zero were 2.5 times more to book first Antenatal care timely as compared respondents those who had parity one and above (AOR= 2.5, 95%CI, 1.6-4.8, p<0.01). The analysis also revealed that respondents those recognize their pregnancy early were three times more to book first Antenatal care within recommended time as compared to referents (AOR=3.53, 95%CI;(1.22, 10.21), p<0.05.

Table 8: Association of Selected Factors by Timely Initiation of First ANC Booking in Wolayita Soddo town, SNNPR, May 2016

Variable		Timing of women first ANC booking		Crude odd ratio (CI)	Adjusted odd ratio (CI)
		Booked timely	Booked lately		
		Fre. (%)	Fre. (%)		
Age	<20 years	31(37.3%)	49(29%)	1.64(0.2- 30)	0.27(0.09, 1.63)
	20-34 years	47(56.6%)	103(63.3%)	1.19(1.11, 2.12)	1.16(0.45-2.99)
	≥35 years	5(6%)	13(7.7%)	1	1
Occupation	House wife	52(20.4%)	111(43.5%)	1	1
	Employed	14(5.5%)	42(16.4%)	0.71(0.33-4.2)	0.67 (0.35-1.27)
	Daily labor	5(1.9%)	14(5.5%)	0.8(0.2, 3.6)	0.23, (0.096-2.4)
	Others	8(3.1%)	9(3.7%)	1.9(1.2-4.8)	1.14 (0.65-1.99)
Women educational level	No formal education	7(2.7%)	9(3.5%)	1	1
	Primary school	17(6.6%)	41(16%)	2.49(1.74, 8.4)	1.61 (0.97-2.67)
	Secondary school	32(12.5%)	49(19.5%)	2.09(1.3, 4.83)	6.25(2.16, 18.06)*
	Tertiary(diploma and above)	29(11.4%)	71(27.8%)	1.31(0.57, 3)	0.89 (0.63-1.27)
Family income	≤500 ETB	30(11.7%)	61(23.9%)	1	1
	501-1000 ETB	45(17.6%)	92(36.0%)	1.0(0.58-3.9)	0.89 (0.57-1.39)
	>1000 ETB	7(2.7%)	20(8.1%)	0.7(0.5-2.2)	0.050,(0.01-1.23)
Pregnancy initiation	Planned	66(25.8%)	131(51.3%)	1.03(1.46, 6.32)	1.15 (0.73-1.82)
	Unplanned	19(7.5%)	39(15.4%)	1	1
Knowledge on timely initiation	Yes	76(29.8%)	132(51.8%)	3.02(1, 9.13)	5.51(1.28, 23.67)**
	No	4(1.6%)	21(16.8%)	1	1
History of abortion	Yes	11(4.3%)	17(6.7%)	1.33(1.35, 9.72)	1.06 (0.61-1.84)
	No	74(29.0%)	153(60%)	1	1
Recognition of pregnancy	1-4 months	72(28.2%)	106(41.6%)	3.55(1.64, 7.69)	3.53(1.22, 10.21)**
	5 and above	9(3.5%)	47(26.7%)	1	1
Parity	Zero	61(23.9%)	56(21.9%)	3.60(1.642, 13.454)	2.5(1.6-4.8)*
	One and above	32(12.5%)	106(41.7%)	1	1
Advised to initiate ANC early	Yes	54(64.3)	90(52.9)	1.6(1.2, 2.74)	1.19[0.47, 3.01]
	No	30(35.7)	80(47.1)	1	1

NB: 1=reference category, *=p-value <0.01, **=p-value <0.05, ***=p-value <0.25

4. Discussion

This facility-based cross-sectional study endeavored to assess timely initiation of first Ante Natal Care booking and its associated factors. The findings of this study revealed that 39% were booked timely (within the four months of pregnancy) while 61% were booked late.

Booking of first Ante Natal Care ranges from third weeks to thirty two weeks of pregnancy. The mean timing of first ANC visit of the respondent booked was 17 weeks with standard

Deviation of 5.3 weeks. This is a better performance when compared with findings of EDHS 2014, whereby only 18% of women booked timely (3). This inconsistency could be attributed to the fact that EDHS covered more remote areas where health institution could be a major predictor of ANC utilization and that of study conducted in Debre Birhan, where among the 446 pregnant women participated, only21% initiated ANC attendance within the first four months of pregnancy. This discrepancy might be due to the time variation of the studies (5).

On the contrary, the proportion of women who initiate ANC visit early was less than the finding from health centers of Addis Ababa, where 65.6% entered ANC within 16 weeks of gestation (13). This difference could be due to the fact that, Addis Ababa is the Capital of the country and the community there might have better health awareness than other parts of the country.

This finding is slightly higher than the study conducted in North West Ethiopia, where 35% of pregnant mothers initiate first ANC visit timely (4). In another study conducted in Mekelle city the proportion of pregnant women who initiated first ANC visit was around 32.7%, which is slightly lower than this study (20). Nevertheless, the findings of this study are higher when compared with a study done in Copper belt (Zambia) whereby of the women who attended ANC 28% of women booked before four months of pregnancy, which might be due to that the study conducted in Zambia included both urban and rural areas, whereas our study is conducted in health institutions found in urban areas (7).

Also, the proportion of pregnant women in this study was higher than the study conducted in Kembata Temba zone (Ethiopia), in which the proportion of pregnant women made their first ANC visit was 31.4% (15). This could be due to the socio-demographic variation between the study areas. In contrast, findings of the present study were lower than the study in Addis Ababa, where 71.8% of respondents initiate timely (28) which might be explained by the fact that the two areas are different in socio-demographic characteristics. This study finding was consistent with a study conducted in Della town, where 35.4% started first ANC visit with in 16 week of gestation (36). Even if a slight difference exists between the two findings, both study areas are found within nearly the same socio-demographic characteristics as the results indicated.

In this study, one of the important factors associated with timely initiation of first ANC visit was women's educational level, where women with secondary and higher education were 6.25 times more likely to initiate than those with primary education as well as women who didn't have formal education. In this regard, our findings were similar with a study conducted in Addis Ababa (13), where women education tended to affect timing of first ANC visit on a study conducted in Kembata Tembaro zone (15). Similarly, this study was in line with the findings from Arba Minch town (South Ethiopia). Educational level of women was significantly associated with early initiation of first ANC visit (30, 31). This finding is also consistent with the study from Dilla town, where level of education determines timely initiation of ANC (36)

This study found that different factors affect early initiation of first ANC visit. Among the other factors that affect timely initiation, one was recognition of pregnancy early by different mechanisms like missed menses and urine test. Based on these parameters pregnant women who recognize early were 3.53 times more likely to initiate than who do not. This finding is in line with the study from North West Ethiopia (4).

This study also identified other factor that affect timely initiation of first ANC visit, which was knowledge, in which pregnant women who had knowledge on timely initiation of first ANC visit 5.51 times more likely to start than who didn't have knowledge and this finding was consistent with the study conducted in Debre Birhan health institution (5). Similarly the study conducted in Addis Ababa revealed that while 65.6% pregnant mothers initiate first ANC visit timely knowledge on the importance of timely initiation was important predictor timely initiation of first ANC (13). Another study conducted in Lesotho showed that lack of knowledge leads to delay entry to ANC visit (18). This finding is also strengthened by the study conducted in Mekelle city (20). Furthermore studies conducted in Addis Ababa and Dilla town stressed on knowledge as important predictor of timely initiation of first ANC visit (28, 36). From these findings and other literature reviews, one can concluded that knowledge has positive effect towards early initiation of ANC visit.

According to this study, pregnant women with no parity before were 2.5 times more likely to initiate timely than those with one and above birth experiences. This finding was consistent with a study conducted in Kembata Tembaro Zone (15); this study finding is also supported by other studies conducted in Uganda and Pakistan which revealed that pregnant women who have no history of parity were more likely to initiate ANC visit timely than their counter parts (21, 30). This study finding was also in line with studies conducted in Malawi and Dilla, in which as parity increase there is likely hood of initiating first ANC visit lately (35,36) respectively.

Limitations

- As this is a cross-sectional study, the associations observed may not be causal enough;
- It didn't generalize the rural community; and
- There might be recall bias when asking about past experience.

5. Conclusion and Recommendations

5.1. Conclusion

More than half of the mothers did not practice timely booking of first ANC though the services are physically accessible and are being provided free of cost. the factor that significantly affect the early booking of the ANC visit in this study were those with secondary education, who have knowledge, those with on their first pregnancy experience and who were recognized their pregnancy were significantly affect timely initiation of first ANC visit.

5.2. Recommendations

Based on the findings of this study the following recommendations were made:

- Future ANC activities of Soddo town Health office should be focusing on improving women's knowledge on timing ANC.
- Health Extension Workers (HEW) should provide clear information on timely booking of ANC, and have to advise on early testing to expectant mothers;
- All stakeholders should focus on advancement of women education.
- The Zone Health Office should emphasis ever more on knowledge, means of communication about early testing and recognition of pregnancy of women on timing of ANC service when programs are planned, implemented and evaluated;

- There should be further quantitative and qualitative studies focusing on early ANC services and factors that improve timely initiation of first ANC visit.

Reference

Abebe A. Assessment of Timing of First Antenatal Care Booking and Associated Factors Among Pregnant Women Who Attend Antenatal Care at Health Facilities in Dilla Town, Gedeo Zone, Southern Nations, Nationalities, and Peoples Region, Ethiopia, 2014.

Aijaz S, Samina M, Munir B, Muhammad A. Azeem. Factors Affecting Utilization of Antenatal Care: the Opinion of Pregnant Women, Pak J Physiology 2013.

Alemayehu T, Yilma M, Zewditu K. Previous utilization of service does not improve timely booking in antenatal care: Cross sectional study on timing of antenatal care booking at public health facilities in Addis Ababa.

Amsalu N Yabo, Mitsiwat A Gebremicheal, Eshetu E Chaka. Assessment of Quality of Antenatal Care (ANC) Service Provision among Pregnant Women in Ambo Town Public Health Institution, Ambo, Ethiopia, 2013,

Amtatachew M Z, Bikes D. Bitewand Digsu NK. Prevalence and Determinants of Early Antenatal Care Visit among Pregnant Women Attending Antenatal Care in Debre Birhan Health Institutions, Central Ethiopia.(Afr J Report Health 2013; 17[4]: 130-136).August, 2011).

Birhanu D.G, Nagasa D Bedada, Fikru T Jaleta, Shimeles O Sinke. Antenatal care utilization and associated factors from rural health extension workers in Abuna Gindeberet district, West Shewa, Oromiya region, Ethiopia, 2014

Bonono R.C., Ongolo-Zogo P. 2012. Optimizing the use of ante-natal care services in Cameroon. Centre for Development of Best Practices in Health – Central Hospital Yaoundé, Cameroon.

Central Statistics Agency [Ethiopia]. 2014. Ethiopia Mini Demographic and Health Survey 2014. Addis Ababa, Ethiopia

Central Statistics Agency Addis Ababa, Ethiopia. ICF International Calverton, Maryland, USA March 2012.

Christina Leah Banda. Barriers to Utilization of Focused Antenatal Care Among Pregnant Women in Ntchisi District in Malawi Tampere School of Health Sciences (Public Health) April, 2013.

Christopher B, Arantza M, Florence W, Nana A. A, Samuel C, Lucinda M-T, Mary J. H. Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi, January 15, 2013

Dereje L, Matiyas Y, Weldesenbet S, Amanuel A, Mesfin W, Henock A, Misganaw B**.** Prevalence of Anemia Among Women Receiving Antenatal Care at Boditii Health Center, Southern Ethiopia,2015.

Ewnetu F. Dayan A. Magnitude and Determinants of Antenatal and Delivery Service Utilization in Arba Minch Town, South Ethiopia. Science Journal of Public Health, Vol. 3, No. 3, 2015

Federal Ministry of Health/ Ethiopian Health and Nutrition Research Institute,

Feleke G,Yohannes D, Bitiya A. Timing of First Antenatal Care Attendance and Associated Factors among Pregnant Women in Arba Minch Town and Arba Minch District, Gamo-Gofa Zone, South Ethiopia, September 2015Article ID 971506.

G.B. OverboschN.N.N. Nsowah-Nuamah, G.J.M. van den Boom, L. Damnyag. Determinants of Antenatal Care use in Ghana.

Gaudy et al.: Timing and factors associated with first antenatal care booking among pregnant mothers in Gondar Town; North West Ethiopia. BMC Pregnancy and Childbirth 2014

Girmatsion F, Gebremeskel M, Mulu T, Abraha W/Michael, Dejen Y, Tesfay G. Predictors of Timing of First Antenatal Care Booking at Public Health Centers in Mekelle City, Northern Ethiopia,2015.

Halle-Ekane GE, Fotabong CM, Njotang PN, et al. Quality of antenatal care and outcome of pregnancy in a semi-urban area in Fako Division, Cameroon: a cross-sectional study. *Women Health Open J*. 2015.

Isaac Banda, Charles Michelo, Alice Hazemba. 2012. Factors Associated with late Antenatal Care Attendance in Selected Rural and Urban Communities of the Copper belt Province of Zambia. Medical Journal of Zambia, Vol. 39, No. 3

Jalina L*,* Usha D Thounaojam, JinaP*,* Salona M*,* H. Sanayaima D, **(**March 2013**).** Knowledge and Practice of Ante-natal Care in an Urban Area.

JennyA, GeYu, BethanH, Joanne Farah, Angela H, Adrian R, (May 2013), Predictors of the timing of initiation of antenatal care in an ethnically diverse urban cohort in the UK.**DOI:** 10.1186/1471-2393-13-103

Jerome KM (2015) Socio Demographic and Clinical Correlates of Antenatal Care among Delivering Women of Goma, Democratic Republic of Congo. J Pediatr Neonatal Care 2(1): 00053. DOI: 10.15406/jpnc.2014.02.00053

Kidist B, Yohannes D and Desalegn W. Determinants of Maternal Health Care Utilization in Holeta town, Central Ethiopia, BMC Health Services Research 2013.

Peter C Kawungezi1, Douglas ABua, Carol A, Michael C, Anxious N, Andrew K, Elizabeth S, Eliud W. Mumbere, Carol M, Cathy T, Arabat K, Sarah N. Attendance and Utilization of Antenatal Care (ANC) Services: Multi-Center Study in Upcountry Areas of Uganda Open Journal of Preventive Medicine,2015.

Report on the 2009 Round Antenatal Care Sentinel HIV Surveillance in Ethiopia,

Serawit Y. Assessment of Late Initiation of Antenatal Care and Associated Factors Among Antenatal Care Attendees in Selected Health Centers of Addis Ababa, Ethiopia, 2015.

Sesedzai P. Knowledge and Utilization of Antenatal Care Services by Pregnant Women at a Clinic in Ekurhuleni, 09 January 2014.

SH Phafoli B Cur (I et A), MSN, PhD, EJ Van Aswegen BA Cur, M Cur, D Litt et Phi and UU Alberts BA Cur, M Cur, D Litt et Phil. Variables influencing delay in antenatal clinic attendance among teenagers in Lesotho,15 Aug 2014,DOI:10.1080/20786204.2007.10873633.

Tesfalidet T, Balcha B. Factors Associated with Late Initiation of Antenatal Care among Pregnant Women Attending Antenatal Clinic at Public Health Centers in KembataTembaro Zone, Southern Ethiopia June 2014.

Tewodros A, Jemal H, DerejeH. Utilization of antenatal care services among teenagers in Ethiopia: A cross sectional study.

Toan K Tran,Karin G, Hinh D, Henry A, Max P. Factors associated with antenatal care adequacy in rural and urban contexts-results from two health and demographic surveillance sites in Vietnam, 15 February 2012, **DOI:** 10.1186/1472-6963-12-40.

V. O. Awusi, E.B. Anyanwu, V. Okeleke. Determinants of Antenatal Care Services Utilization in EmevorVillage, Nigeria, Email: alpha.medicalcentre@yahoo.com

World Health Organization. 2014. Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, the World Bank and the United Nations Population Division.

Yared M. Patterns of maternity care service utilization in Southern Ethiopia: Evidence from a community and family survey.

Yohannes D, Mesganaw F and Michelle J H. The effects of pregnancy intention on the use of antenatal care services: systematic review and Meta-analysis Reproductive Health 2013.

Zemzem M. Assessment of Timing of First Antenatal Care (ANC) Initiation and Associated Factors among Pregnant Women in Selected Public Health Centers in Addis Ababa, Ethiopia, 2014.