Time of Antenatal Care Booking and Associated Factors Among Pregnant Women Attending Ambo Town Health Facilities, Central Ethiopia

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Abstract: *Back ground*: Antenatal care is a key intervention for reducing maternal and child mortality if initiated during early pregnancy. However, the existing evidence from developing countries, including Ethiopia indicates that most pregnant women attending ANC in their late pregnancy. Therefore, the objective of this study was to assess the time of antenatal care booking and associated factors among pregnant women attending Ambo town health facilities, central Ethiopia. *Methods:* A facility based cross-sectional study design was conducted among pregnant women attending Ambo town health facilities from February 1 to March 30 of 2012. A total of 379 pregnant mothers were interviewed at exit from antenatal clinic by using structured and pre-tested questionnaire. The data was analyzed using SPSS version 16 and a logistic regression data analysis was carried out. *Results*: The study revealed that only 13.2% of the study respondents were started ANC timely (in the first trimester of pregnancy). Women's education (2.10, 95% CI =1.13, 3.82), women's residence (2.86, 95% CI =1.11, 4.38), family monthly income (1.98, 95% CI =1.03, 4.31) and awareness on time of booking (3.86, 95% CI =1.11, 2.38) were found to be a significant predictors for time of ANC booking. *Conclusion*s: Timely entry to antenatal care was low in the study area. In order to improve the situation, it is important to provide community based information, education and communication on antenatal care and its right time of initiation. In addition, investing on women education is very important for increasing their decision power to use focused ANC service effectively.

Keywords: Antenatal Care, Time of Booking, Trimester, Ambo Town

1. Introduction

Worldwide up to 358,000 women die each year in pregnancy and childbirth related complications. Of this, 99% of maternal deaths occur in developing countries where 85% of the populations live. More than half of these deaths occurred in sub-Saharan Africa. In Ethiopia, maternal mortality and morbidity levels are among the highest in the world. The Maternal Mortality Ratio (MMR) in the year of 2011 was 676 per 100,000 live births [1-3].

The new WHO antenatal care model and the national institute for health and clinical excellence guidelines recommend that first antenatal care booking within the first trimester of pregnancy. Among the several examinations and tests recommended by WHO, timely booked mothers offered screening for HIV infection, which helps early detection and prevention of the transmission [4-6]. On the other hand, provision of micronutrient supplements especially iron and folic acid during early pregnancy and if possible before conception is among strongly recommended interventions. It is well known that folate deficiency in early pregnancy is associated with congenital malformations such as neural tube defects and increased DNA damage. Besides such birth defects, babies of mothers with folate deficiency are more likely to be small for gestational age, delivered pre-term, develop sever language delay and even are at high risk for mortality [7-8].

Though basic ANC services were provided free in Ethiopia, according to Demographic and Health Survey of 2011, only 34% and 11.2% of women made at least one visit and their first ANC visit before the fourth month of

pregnancy respectively [3]. Therefore, the aim of this study was to find out the proportion of women who were timely booked and to identify factors contributing for timely booking of ANC.

2. Methods

A facility based cross-sectional study design was conducted among pregnant women attending ANC clinic of Ambo town health facilities from February 1 to March 30 of 2012. Ambo town is the capital city of West Shoa Zone, which is located 110 kilometers away from the capital city of Addis Ababa and Ambo town has six kebeles (small administrative units) with a projected population of 60,754 in 2007 Ethiopia population census report. In Ambo town, there are two health centers and one zonal hospital owned by the government. All pregnant mothers who came for ANC visit for the current pregnancy were included in the study and mothers who were sick during the study period were excluded.

The sample size was calculated using single population proportion formula by considering prevalence (p) 42.2% of ANC booking within first trimester taken from study in Ethiopia [14] and 95% confidence interval and 5% margin of error and 5% non-response rate. All the total three public health facilities found in Ambo town were included and a number of pregnant mothers who visit each health facilities were identified based on their previous year client flow. Then using proportion to size allocation, the total sample was shared to all selected health facilities. Then using systematic sampling every other pregnant woman who came for ANC during data collection period was interviewed.

Data were collected through face-to-face interviews using a structured and pre-tested questionnaire. The questionnaire was first prepared in English then translated to Afan Oromo and back to English again by language expert in order to maintain the consistency of the instrument. A pre-test was conducted on 18 (5%) pregnant mothers in one health center out of the study area called Guder Health Center before the main data collection and the instruments were amended accordingly. Three diploma nurses had conducted the face-to-face interviews and one BSc. degree Midwife had supervised the data collection process. Training was given to the data collectors and supervisor before the actual data collection regarding the aim of study, data collection tool and procedures.

In this study, gestational age means the age of the fetus in weeks from the last normal menstrual period of the mother. The dependent variable was time of ANC booking. If the mother came for ANC visit before or at 16 weeks of gestation for the first time during the pregnancy, she will be considered as having early booking (within the recommended time) unless she is considered as late attendance.

Data entry was done by using EPI Info version 3.4.3 and exported to SPSS version 16.0 software package for analysis. The data was first analyzed using bivariate logistic regression and then all explanatory variables that had p-value ≤ 0.05

were entered into multivariate logistic regression model to determine the effect of various factors on the outcome variable and to control confounding effects. The results were presented in the form of tables, figures and texts using frequencies and percentage to describe the study population in relation to relevant variables. The strength of association between independent and dependent variables was assessed using the odds ratio with 95% confidence interval.

Ethical clearance was obtained from the ethical review committee of Jimma University, college of public health and medical sciences and formal letter of permission was obtained from the health administrative body to all the selected health facilities.Then finally, an informed verbal consent was secured from the study participants after brief information about the purpose of the study.

3. Results

3.1. Socio-demographic Characteristics of the Study Population

Table 1. *Distribution of ANC client by Socio-demographic characteristics, Ambo town, May 2012.*

Variables		Frequency (379)	Percentage
Age in years	15- 19	50	13.2
	20-24	170	44.9
	25-29	99	26.1
	30-34	43	11.3
	35-39	17	4.5
Residence	Town	260	68.6
	Rural	119	31.4
Ethnicity	Oromo	346	91.3
	Amhara	30	7.9
	Tigre	3	0.8
Marital status	Married	371	97.9
	Single	8	2.1
Religion	Orthodox	210	55.4
	Protestant	162	42.8
	Muslim	7	1.8
Education	Can't read and write	45	11.9
	Only read andwrite	46	12.1
	Grade 1 to 8	148	39.1
	Grade 9 to 12	67	17.7
	Above grade 12	73	19.3
Occupation	House wife	133	35.1
	Daily labourers	25	6.6
	Merchants	40	10.6
	Students	11	2.9
	Farmers	115	30.3
	Civil servants	55	14.5
HusbandEducation	Can't read and write	44	11.9
	Only read and write	58	15.6
	Grade 1 to 8	108	29.1
	Grade 9 to 12	43	11.6
	Above grade 12	118	31.8
Husband Occupation	Daily labourers	67	18
	Merchants	56	15
	Private workers	20	5.4
	Farmers	112	30.4
	Civil servants	116	31.2
House hold monthly income	< 400 EBR	171	45.1
	400 -1000 EBR	113	29.8
	> 1000 EBR	95	25.1

A total of 379 pregnant women were involved in the study

with a response rate of 96.7%. The mean age of the respondents was 24.4 + 4.6 years. The majority 260 (68.6%) of the study respondents were from urban residence and 346 (91%) of study respondents were Oromo by ethnicity. Three hundred seventy one (98%) of study participants were married and 210 (55.4%) were orthodox religious follower. One hundred forty eight (39.1%) of the study participants were primary education attendants and one hundred sixteen (31.3%) were civil servants in occupation. One hundred seventy one (45.1%) of the respondents were their family monthly income of less than 400 Ethiopian birr per month (Table 1).

3.2. Past ANC Service Utilization History and Time of ANC Booking

From the total 379 study participants, 225 respondents were had history of previous pregnancy and among those who had history of pregnancy185 (82.6%) had experience of ANC for the pregnancy preceding the current. Among 185 respondents who were experienced ANC service utilization in the past pregnancy, 32 (17.3%) were booked their previous ANC within the first 16 weeks of gestational age while the rest 153 (82.7%) were booked their previous ANC service after 16 weeks of gestational age(Table 2).

Table 2. *Distribution of past ANC service utilization history and awareness on booking, Ambo town, May 2012.*

Variables		Frequency	Percentage
Past pregnancy	Yes	225	59.4
history	No	154	40.6
Hx of ANC utilization for the pervious pregnancy			
Yes		185	82.6
No		40	17.4
Time of ANC booking in the preceding pregnancy			
Within 16 weeks of GA		32	17.3
After 16 weeks of GA		153	82.7

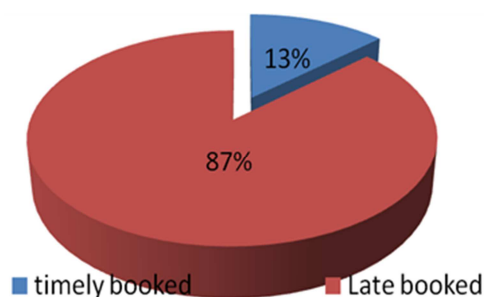### 3.3. Time of First ANC Booking

Figure 1. *Distribution of study respondents by time of ANC booking, Ambo town, May 2012.*

The study shows only 50 (13.2%) of the study participants were booked timely for ANC service; whereas the majority 329 (86.8%) of the respondents were booked late. The pattern of ANC booking ranged from 4 weeks to 36 weeks of pregnancy, the peak being at 20th week of pregnancy. The

mean time of ANC booking among the respondents was 4.7 + 1.3 months (figure 1).

3.4. Factors Associated with Timely Booking of ANC

The final multivariate regression model shows the association remained statistically significant even after controlling the possible confounders were; respondents residence, education, family monthly income and awareness on time of ANC booking. As above mentioned, this variables were more likely to start ANC service within the recommended time compared to their counter parts with (AOR = 2.86 95% CI 1.11- 4.38), (AOR = 2.10 95% CI 1.13-3.82), (AOR =1.98 95% CI 1.03- 4.31) and (AOR = 3.86 95% CI 1.11- 2.38) respectively (Table 3).

Table 3. *Predictors for time of ANC booking among ANC attendants, Ambo town, 2012.*

VARIABLES	Crude OR(95%CI)	AOR(95%CI)
Residence Urban	1	2.86 (1.11, 4.38)
Rural	5.86 (2.05, 8.68)	1
Education Can't read and write	1	1
Read and write	5.35 (2.09, 7.92)	1.62(0.09,4.10)
Primary education	3.75 (2.56, 6.09)	1.03(0.28,3.76)
Secondary education	2.57 (1.48, 5.54)	0.96 (0.03,3.81)
Above grade 12th	7.70 (2.65, 9.25)	2.10 (1.13, 3.82)
Family monthly income		
< 400(EBR)	1	1
400 – 1000(EBR)	2.23 (1.59, 6.56)	1.75 (0.65,4.70)
> 1000 (EBR)	4.76 (2.08,8.34)	1.98 (1.03, 4.31)
Awareness on time of ANC booking		
Yes	5.59 (3.25,8.37)	3.86 (1.11, 2.38)
No	1	1

4. Discussion

According to the WHO and the National Institute for Health and Clinical Excellence recommendations; every pregnant mother should start ANC booking during the first trimester of pregnancy. It is also more effective in preventing adverse pregnancy outcomes when it is started in early pregnancy and continued throughout until delivery [9, 10]. However, in this study only 13.2 % of the respondents were booked for ANC service timely(within the recommended time; whereas the rest about 86.8% of the respondents were started the ANC service during their second and third trimesters which were late according to WHO recommended focused ANC service for developing countries [11].

This finding is consistence with the study conducted in Kenya, which showed that 12.6% of pregnant women were booked for ANC service during their first trimester of pregnancy [12]. However, this finding was lower than the study conducted in Addis Ababa; which showed that 42% of the pregnant women were booked for ANC within the first trimesters of pregnancy [14]. This difference is may be due to the socio-demographic characteristics found among the two study participants and accessibility of different IEC

materials.

The respondents' education and residence were the predictors for time of ANC booking. This finding is consistence with study conducted in Nigeria; which showed that women residence, women education, age women age, women occupation and family income were factors associated with timely booking of ANC services (13).

The finding also showed that women awareness on time of ANC booking was a predictor for the time of ANC booking. Pregnant Women who got information on time of ANC booking were nearly four times more likely to attend ANC timely than those women who did not got information on time of booking. This study is consistence with the study finding in Addis Ababa, which showed that awareness on time of ANC booking increases the timely initiation of ANC service by pregnant women [14].

5. Conclusion

Only one eighth of the study respondents were initiated ANC service within the recommended time and respondents residence, education, awareness on time of booking and family monthly income were statically significant factors for time of ANC booking. It is important to provide community based information, education and communication on antenatal care and its right time for initiation. In addition, investing on women education is very important for increasing their decision power to use focused ANC service effectively.

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