

Magnitude and Associated Factors of Late Booking for Antenatal Care in Public Health Centers of Adigrat Town, Tigray, Ethiopia

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Abstract

Background: Antenatal care (ANC) is attention given to a pregnant mother from the time of conception until the beginning of labor. It has an impact on the development of the fetus as well as the health of the mother. It can be achieved through early booking and regular attendance of antenatal clinic.

Objective: This study assessed the magnitude and associated factors for late booking for antenatal care in Adigrat town.

Methodology: A facility based cross-sectional study was employed to collect data from 415 pregnant women using face-to-face interview. Descriptive statistics, Bivariate and multivariate binary logistic regression analysis were used to identify associated factors with late booking for ANC.

Result: Two hundred fifteen (51.8%) pregnant women booked their first ANC late. The multivariate logistic regression analysis showed that pregnant women who had parity one and above, unplanned pregnancy and those who had a perception time to book ANC is after four months of gestational age were increased but having no history on abortion decreased the likelihood of late booking than the reference category.

Conclusion: The prevalence of late booking for ANC was found high in Adigrat and the possible factors for this were parity one and above, had no history of abortion, unplanned pregnancy and perception the time to book ANC. To improve this addressing the identified factors by community mobilization and promoting the importance of early booking for ANC are mandatory.

Keywords: Antenatal care; Late booking; Women; Adigrat; Factors; Magnitude

Introduction

Antenatal care (ANC) refers to the care that is given to an expectant mother from the time that conception is confirmed until the beginning of labor; adequate utilization of antenatal care is associated with improved maternal and neonatal health outcomes¹. Antenatal care is expected to have impact on the development of the fetus and the infant as well as on the health of the mother and this can only be achieved through early booking and regular attendance of antenatal clinic [1-3]. Getting ANC within 0-3 months of pregnancy are considered as early booking and getting after four months are considered as late pregnancy.

Globally, each year about 210 million women become pregnant, of these only 71% ever receive any ANC and 135 million have live births [3,4]. Each year in Africa 30 million women become pregnant, and about 250,000 of them die from pregnancy-related causes and in sub-Saharan Africa in 2010 there were an estimated (162,000) maternal deaths with maternal mortality rate (MMR) of 500 per 100,000 live births [5,6]. Receiving sufficient number and timely ANC visit helps to improve maternal health outcomes but in sub-Saharan Africa the ANC

utilization is low; the pregnant women who have at least one ANC visit were 69%, at least four ANC visit were 44% and pregnant women who gets ANC within 0-3 months of pregnancy were only 20%, which is low coverage comparing to other parts of the world [3,7].

The main obstacle in improving maternal health care and reducing maternal mortality is the lack of adequate ANC [8]. In Ethiopia about 22,000 women die each year as a consequence of complications happen during pregnancy or childbirth, and more than 500,000 women suffer from pregnancy-related disabilities [9].

According to 2011 Ethiopia Demographic and Health Survey (EDHS) report about six in every ten Ethiopian women (57%) did not receive any antenatal, 34% had at least one antenatal visit, 19% had four or more ANC visits during the length of their pregnancy and only 11% of women made their first ANC visit before the fourth month of pregnancy [10].

Different studies revealed the following as factors for late booking of ANC; maternal education, husband education, age, parity, type of pregnancy, unemployment, ethnic origin, lack of knowledge or misconceptions about the value/purpose of antenatal care, marital status, socio economic status, financial constraints, afraid of perceived enemies who may harm the pregnancy, problems in the last delivery/pregnancy [11-23].

According to the Ethiopia ministry of health annual performance report for 2011 the coverage of first antenatal care coverage of Tigray region was about 85% which was above the national target and according to the Adigrat Health Office annual report for the year of 2005 E.C the coverage of first antenatal visit of the town was 95% but these two reports didn't include the timing of the first antenatal care [24-31]. Therefore this study tried to fill the gap on the information of the magnitude and factors associated with late booking of antenatal care that enable the health care stakeholders to determine the factors causing late booking for antenatal care and how to eradicate it.

Materials and Methods

Study area

Adigrat Town is the capital city of Eastern Zone of Tigray Region with estimated population of about 66,765 according to the 2007 population and house hold survey [32-36]. The town is divided in to 6 kebelles. There are one district hospital, 2 governmental health centers, and 4 private clinics (2 medium and 2 higher). This study will be conducted in all the governmental health centers of the town.

Facility based cross sectional study design was employed to collect data on early or late initiation of ANC over a period from Jan 27 to April 01, 2014 among pregnant women in Adigrat Town using systematic random sampling technique.

All pregnant women who live in Adigrat town administration and using the public health centers for ANC were the source population. The sample size for this study was calculated using the formula for a single population proportion. The assumptions considered were the following:- A 95% confidence level, margin of error (0.05), since there was no prevalence related study before at Adigrat on timing of first ANC visit, a prevalence of 50% was taken to estimate the sample size.

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2}$$
$$= \frac{(1.96)^2 (0.5)(0.5)(1)}{(0.05)^2} = 384$$

Where n= Required sample size

Z= Critical value for normal distribution at 95% confidence level which equals to 1.96

P=Estimated prevalence rate 50% (.50)

d= 0.05 (5% margin of error)

Adding 10% non-response rate give the required minimum sample size of 423.

This study was conducted in all the governmental health centers found in the town, where the ANC service is free of charge. First the total number of pregnant mothers who visited the health institutions during the study period was calculated by multiplying the average daily ANC users by the total study period then systematic random sampling was employed to select each study subjects. The sampling fraction of every 4th pregnant women was determined separately for both health centers. If an individual does not satisfy the inclusion criteria, then the next participant was included in the study.

Inclusion criteria was pregnant women who live in Adigrat town for six months and above but pregnant women who do not know the

duration of pregnancy and mentally instable were excluded from the study.

The questionnaire was adapted from previous similar studies 11-16 and modified based on the research setting, first developed in English and then translated to local language (Tigrigna). Training of data collectors on information about the research objectives, data collection tools and procedures, and interview methods was conducted for one day. The questionnaire incorporates both the close ended and open-ended types of questions. The questionnaire was pre-tested one week before the actual data collection on 5% of the calculated sample size in Mekele health center in pregnant mothers attending ANC. The data collectors were not an employee of the health centers and they were not wearing the uniform while they were interviewing. The questionnaire comprises of three parts; the first part includes demographic and socioeconomic characteristics of pregnant mothers, second part consist of knowledge and perception on timing of ANC related variables and the third part consists of obstetric related variables and the questionnaire were administered by two trained diploma level nurses. The data collection technique was face to face interviewing and conducted at exit after the pregnant women finishing their ANC visit. To control double count of the pregnant mothers the data collectors were made a sign in the interviewed mother client card.

The dependent variable was timing of first ANC; pregnant women who come for first ANC after 4 months of their gestational age are considered as late booking for ANC and coded as "1" otherwise coded "0". This reference was taken from the last menstrual period of the pregnant women.

The following explanatory variables were identified using literature reviews: Demographic and Socio-economic variables: Age, marital status, maternal education, husband education religion/ethnicity, occupation, monthly income of the household, transportation cost and residence/kebele; Knowledge and perception factors: Awareness on importance of ANC and Perceptions timing of ANC; and Obstetric factors: Parity and Type of pregnancy (Wanted or Unwanted), Past obstetric problems.

Data analysis

The data were entered, coded, cleaned and analyzed using SPSS for windows version 20. Descriptive statistics of frequencies and percentages were calculated for categorical variables and presented in the form of figures, tables and texts. Bivariate and multivariate binary logistic regression analyses were used to identify predictors associated with late booking for ANC. Variables significantly associated in bivariate binary logistic regression were entered into the multivariate binary logistic regression model. Stepwise backward elimination model development method was used and variables with p-value<0.05 in Wald chi-square test were considered as significantly associated outcome variable. Moreover, in this data analysis confounding, interaction and multicollinearity were checked, and we found no confounding effect, interaction and multicollinearity. Confounding and interaction were checked using change on the coefficient of the regression, if the change is >15% and the interaction term is significant, considered as effect modifier, but if not significant considered as a confounder. Multicollinearity was checked using varinace infaltion factor (VIF), if it VIF is >5 considered as collinear.

An ethical clearance was obtained before conducting this research from College of Health Science ethical committee of Mekelle University. The health centers were included in this study after the

permission received from the Adigrat Health Office using formal letter. Written Informed consent was obtained from clients who were participated in the study. Confidentiality of response was maintained at all time. Personal privacy and cultural norms were respected properly.

Result

Demographic and socio-economic characteristics

From 423 questionnaires were administered, 98% were returned. Of these 154(37.1%) of the pregnant women were in the age group of 20-24 years followed by 128(30.8%) in the age group of 25-29. Among the pregnant women 395(95.4%) were Tigray ethnic group and 381(92.0%) orthodox in religion. From all the pregnant women 361(87%) were married, 101(46.0%) attained secondary school education and 251(60.5)% family income were less than 1000 ETB (Table 1).

Variable	Number	Percent
Age		
15-24	190	45.8
25-34	190	45.8
35-39	35	8.4
Ethnicity		
Tigray	395	95.4
other	19	4.6
Religion		
Orthodox	381	92
other	33	8
Marital status		
single	16	3.9
married	361	87.0
living together	32	7.7
divorced or widowed	6	1.4
Maternal education of the mother		
Primary and below	169	40.7
Secondary and above	246	59.3
Husband educational status		
Primary and below	109	27.3
Secondary and above	290	72.7
Occupation of the mother		
employed(wedged)	158	38.1
house wife	257	61.9
Family Income		

<400 Ebirr	68	16.4
401-1000 Ebirr	183	44.1
>1001	164	39.5

Table 1: Demographic and socio-economic characteristics of pregnant mothers at Adigrat, 2014.

Knowledge and perception on timing of ANC

All the pregnant women 415(100%) perceived that ANC was important for the health of the mother and fetus while 405(97.6%) pregnant women rated the importance of ANC as highly important. Three hundred twenty one (78.5%) of pregnant mothers perceived that the right time to book ANC was before four months of gestational age and 260(63.3%) perceived that 4-6 times of ANC visit were necessary (Table 2).

Variable	Number	Percent
Perception of impotence of ANC		
Yes	415	100
Rating the importance of ANC		
Highly important	405	97.6
Medium	10	2.4
Perception on timing of ANC		
Before and at 4 months of gestation	321	78.5
After 4 months of gestation	88	21.5
Perceived number of ANC visit per pregnancy		
one to three visits	97	23.6
four to six visits	260	63.3
more than six visits	54	13.1

Table 2: Knowledge and perception on timing of ANC by pregnant mothers, Adigrat Town, 2014.

Obstetric history

Two hundred sixty four (63.6%) of pregnant women were multi-gravid, 358 (86.3%) pregnant women were with no history of abortion, 247(59.5%) with one and above parity, 15(6.1%) with history of child death, 238(96.3%) assisted by spontaneous vaginal delivery and 12(4.8%) reported as they were exposed to pregnancy related problem in their last pregnancy (Table 3).

Variables	Number	Percent
Number of pregnancy N=415		
prime gravid	151	38.4
multi gravid	218	52.5
grand gravid	46	11.1
History of Abortion		

Yes	57	13.7	Yes	377	98.9
No	358	86.3	No	4	1
Type of abortion N=57			Pregnancy Wanted By Mother- N=22		
Spontaneous	48	84.2	Yes	20	90.9
Induced	9	15.8	No	2	9.1
Parity N=415			Telling about pregnancy for1st time N=415		
No parity or zero parity	168	40.5	Husband	356	85.7
Para one and above	247	59.5	Mother	22	5.3
History of child death N=247			Sister	22	5.3
Had no history of child death	232	93.9	Friend	15	3.6
Had history of child death	15	6.1	Advice from significant others		
History of still birth N=247			Yes	231	55.6
No history of still birth	240	97.1	No	184	44.3
Had history of still birth	7	2.8	From whom you get advice? N=231		
Method of delivery N=247			CHW	91	39.3
Spontaneous vaginal delivery	238	96.3	Husband	71	30.7
Cesarean section	9	3.6	Mother	17	7.3
Any pregnancy related complication N=247			Sister	18	7.8
Yes	12	4.8	Friend	9	3.9
No	234	95.1	Neighbor/WHDA/	25	10.8
Type of the pregnancy related problem N=12			Did he/she informed you when to start? N=231		
APH	2	18.2	Yes	187	80.9
Intra uterine fetal death	1	9.1	No	44	19
Mal presentation	1	9.1	Advice when to start ANC N=187		
Morning sickness	1	9.1	Advice to seek care before 4 & at 4months	184	98.4
Poly hydroamniouse	1	9.1	Advice to seek care after 4 months	3	1.6
PPH	1	9.1			
Preterm labor	1	9.1			
Retained placenta	1	9.1			
RH-VE	1	9.1			
Uterus prolapsed	1	9.1			
Means to confirm pregnancy					
Missed period 1-3 menses	279	67.2			
Missed period above 4 and other factors	136	32			
Pregnancy planned-415					
Yes	393	94.6			
No	22	5.3			
Did the plan include your husband?-N=381					

Table 3: Variables Related to obstetric history Adigrat Town, 2014.

Timing of first ANC visit

The proportion of pregnant women who booked their first ANC after four months of gestational age were 215(51.8%). Among the pregnant women 246(59.4%) reported the reason for the specific time for first ANC visit perceiving as appropriate time (Figure 1).

Factors associated with booking time for ANC in Adigrat Town, 2014

In the bivariate binary logistic regression analysis the following variables found to be significantly associated with late booking for ANC at p-value<0.05, maternal age, maternal education, husband education, parity of the mother, gravidity, previous experience on abortion, type of pregnancy, advice from significant others and perception on timing of ANC.

From the variables associated with late booking for ANC in the bivariate binary logistic regression; parity of the mother, previous experience on abortion, type of pregnancy and perception on timing of ANC were statistically significant with late booking for ANC in the multivariable binary logistic regression.

When all the other variables in multivariable regression adjusted the following results found. Pregnant women who had parity one and above were almost 3 times more likely to book late for ANC than mother with zero parity (AOR=2.78; 95%CI, 1.715-4.494). Pregnant women who had no history on abortion were 71.1% times less likely to book late than pregnant women who had history on abortion (AOR=0.29; 95%CI, 0.137-0.607). Mothers with unplanned pregnancy were 16 times more likely to book late comparing to pregnant women with planned pregnancy (AOR=16.04; 95%CI, 3.445-74.639). Those who had a perception the time to book ANC is after four months of gestational age were 39 times more likely to book late than women who had a perception to start ANC is before four months of gestation (AOR=39.10; 95%CI, 11.884-128.638) (Table 4).

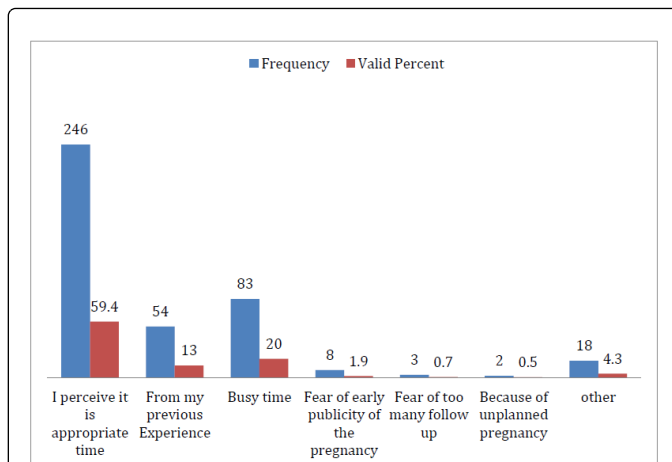


Figure 1: Reasons for the specific time of first ANC of Adigrat Town, 2014

Variables	Early attendants	Late attendants	Crude OR(95%CI)	Adjusted OR(95%CI)
Age in the last birth				
15-24	105(55.3%)	85(44.7%)		
25-34	85(44.7%)	105(55.3%)	1.526(1.018-2.287)	
35-39	10(28.6%)	25(71.4%)	3.088(1.406-6.785)	
Maternal education				
Illiterate	17(42.5%)	23(57.5%)		
primary(1-8)	44(34.1%)	85(65.9%)	1.428(0.612-2.949)	
Secondary	103(53.9%)	88(46.1%)	0.631(0.317-1.257)	
College diploma and above	36(65.5%)	19(34.5%)	0.390(1.69-0.902)	
Husband education				
Illiterate	9(50.0%)	9(50.0%)		
primary(1-8)	31(34.1%)	60(65.9%)	1.935(0.698-5.371)	
Secondary	89(48.9%)	93(51.10%)	1.045(0.397-2.753)	
college diploma and above	65(60.2%)	43(39.8%)	0.662(0.243-1.80)	
Number of pregnancy				
prime gravid	90(56.6%)	61(40.4%)	1	
multi gravid	93(42.6%)	125(57.3%)	1.983(1.301-3.023)	
grand gravid	17(36.9%)	29(63.0 %%)	2.517(1.274-4.974)	
Parity				
parity zero	103(61.3%)	65(38.7%)	1	1
Para one and above	97(39.30)	150(60.70.9%)	2.45(1.639-3.663)	2.776(1.715-4.994)
History of abortion				

Yes	160(44.7%)	198(55.3%)	1	1
No	40(70.2%)	17(29.8%)	0.343(0.188-0.629)	0.289(0.137-0.607)
Pregnancy plan				
Yes	198(50.4%)	195(49.6%)	1	1
No	2(9.1050)	20(90.9%)	10.154(2.342-44.026)	16.035(3.445-74.639)
Advise to start ANC				
YES	125(54.1%)	106(45.9%)		
No	75(40.8%)	109(59.2%)	1.714(1.158-2.536)	
Perception on timing to start ANC				
Before 4 months of gestation	195(59.5%)	133(40.5%)	1	1
After 4 months of gestation	3(3.7%)	78(96.3%)	38.12(11.784-123.318)	39.098(11.884-128.638)

Table 4: Multivariate logistic regression analysis result for variables associated with late booking for ANC among pregnant mothers attending ANC service in Adigrat town, 2014.

Discussion

The study attempted to assess the magnitude and associated factors of late booking for antenatal care (ANC) at Adigrat Town. This study reported 51.8% pregnant women were booked late. According to the World Health Organization (WHO) recommendation for developing countries, more than half of the women in this study booked late (booked after the four months of gestational age). A similar result was reported by the study conducted at North Central Nigeria (53.3%) [13]. The proportion of those who booked after the first trimester (70.1%) was even worse if this commonly used period was the estimate and this result was similar to study conducted at Niger Delata, Nigeria (73.6%) [12].

The proportion of pregnant women who booked late was found lower compared to a study done in Hadiya Zone (91.3%) and Yem (87.5%) in Southern Ethiopia in 2009 and in Debrebirhan in central Ethiopia (73.8%) in 2012 [20,32,33]. This gap might be because of differences in the study population which is the above studies included both urban and rural residents whereas this study was done on urban residents only.

The proportion of pregnant women who booked late was higher comparing to a study done in Addis Ababa (60%) in 2008 [19]. Pregnant mothers resident of big city are more likely to get an access for health service and health information than residents of small towns.

Parity was a factor for late booking for ANC. Mothers with parity one and above were more likely to book late for first ANC compared to those with parity zero. This finding was similar with those of studies done in Addis Ababa, Debrebirhan-Ethiopia, and Nigeria [19-21]. These women may feel that they do not need to attend as early because they already know what to expect during pregnancy and childbirth. These women may also have difficulty of arranging childcare for other children in their home in order to attend antenatal care.

Pregnant mothers who had a history on abortion were less likely to book late than those who had no history on abortion and this was similar result with the study conducted at South Western Nigeria [21].

The pregnant mothers might perceive that bad obstetric history makes one susceptible to bad pregnancy outcomes. They might also get focused counseling about their next pregnancy ANC visit at the time of abortion from health care workers.

Pregnant mothers with unplanned pregnancy were more likely to book late for ANC than with planned pregnancy ones. This finding was agreed with studies done in Addis Ababa, Debre-Birhan, Nigeria, Malawi and Tanzania [17,19,20,22]. Pregnant women with unplanned pregnancy may probably have less love to such pregnancy and It could also be detected later by the mother, therefore possible that they may not seek proper care for healthy development of their pregnancy and might not be interested to get information about ANC from significant others.

Pregnant mothers may have right or wrong perception on the gestational age to book for ANC. This study revealed that those who had a perception on booking time after four months of gestational age more likely to book late than those who had the perception on booking for ANC before four months. This find is similar with studies conducted in Addis Ababa and Malawi [19,22]. Usually human being practice what they perceive therefore effort is needed to have all the mothers the right perception on timing of first ANC.

The obstacles like time constraint and the wrong perception on the right time to book for ANC, cultural beliefs like fear of early publicity of the pregnancy, fear of too many follow up were forwarded all most by all late attendants and this had a similar with study conducted in Niger Delta, and North Central Nigeria [12,13].

Limitations

The governmental public health centers were preferred to conduct this study due to their accessibility to majority of the community of the town however there might be pregnant mothers who attend in private and hospitals. Therefore this study lacks to address the pregnant mothers who attend in private and hospitals because they may made socio demographic difference. And since this study is facility based study it may lacks generalization about all pregnant mothers of the town.

Conclusions

The study has explored the magnitude and factors associated with late booking for ANC among women of Adigrat town. The study has reported that high prevalence of late booking for ANC. The factors associated with late booking of ANC were including: high Parity, unplanned pregnancy, no history of abortion and perception on timing of ANC.

Significant number of pregnant mothers' reason out for the specific time for first ANC visit as time constraint, fear of early publicity of pregnancy, fear of too many follows up and others.

These results reflect the presence of inadequate knowledge in the pregnant women about the right knowledge of modern ANC services.

Recommendations

From these results we recommend that community mobilization should be strengthened at all levels to address the cultural barriers and low awareness of FANC. Mobilization of community should include groups of pregnant women to disseminate the information easily, specifically on the correct time to book ANC and dangers on late booking for ANC in time. This would empower them with the right knowledge on ANC services. There should be a continuum of ANC from the community to health facilities to offer tremendous opportunities to pregnant women. There must be effective collaboration of ANC providers at all 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.

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