Factors Associated with timely first Antenatal Care Booking among Pregnant Women attending Antenatal Clinics in Asella Town Public Health Institutions, Arsi Zone Oromia Regional State, Ethiopia, 2017

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ABSTRACT

Background: The problem of mortality is the issue of both developed and developing countries, especially in sub-Saharan Africa including Ethiopia. This is known due to the poor quality of maternal health care services. Almost all causes of maternal death are preventable, so antenatal care is the entry point to tackle those causes of maternal death as well as complications during pregnancy. However, the timely starting of the first Antenatal care visit is not well practiced in country Ethiopia according to evidence from different literature. Due to this reason many mothers died because of pregnancy complications.

Objective: To assess timely booking of first antenatal care visit and affecting factors among pregnant women attending Antenatal care clinics in Asella town public health institutions, Ethiopia, 2017

Methods: The institution based Cross-Sectional study design was conducted from March – April, 2017, on 334 pregnant women.

Results: The study revealed that only 37% of the study respondents were started first Antenatal care visit timely. Husband involvement (AOR=8.17, 3.15-2), pregnancy related complications (AOR= 2.8, 1.2-6.6), Birth experience (AOR= 2.5, 1.4-4.5), Knowledge on time begin ANC (AOR=5.6, 3.3-9), Payment of service (AOR=0.5, 0.3-0.9), waiting time (AOR=0.6, 0.3-0.9) have association.

Conclusion: Early initiation of first antenatal care booking in the area was considered to be low.

Keyword: Early initiation of first Antenatal care; Pregnancy; Antenatal care; Asella town

INTRODUCTION

Antenatal Care (ANC) is a type of care given to women during pregnancy and it is one of the bases of maternal health service. The major goals are Health promotion and disease prevention, early detection and treatment of complications and existing diseases, birth preparedness and complication readiness planning(WHO, 2002b).

The World Health Organization recommends a minimum of four antenatal visits, comprising interventions such as tetanus toxoid vaccination, screening and treatment for infections, and identification of warning signs during pregnancy(WHO, 2014). Prevention and treatment of any complications; emergency preparedness; birth planning; satisfying any unmet nutritional, social, emotional and physical needs of the pregnant woman; provision of patient education, including successful care and nutrition of the newborn; identification of high-risk pregnancy; encouragement of partner (especially male) involvement in antenatal care are the main objectives of antenatal care ((GHO), 2011.).

The new WHO antenatal care model recommends that first ANC visit should occur within the first trimester of pregnancy. The first visit offers an opportunity to establish baseline information on the general wellbeing of the mother and the pregnancy. It also helps the expectant mothers assess personally the services provided in the facility and build up their impression of the establishment ((GHO), 2011.; WHO, 2002a).

Identification of complications or risk factors for complications on timely visit enables early initiation of interventions to alleviate or mitigate the effects of such complications on the mothers and unborn babies (B, E, M, & P., 2008).

Globally, 10.7 million women have died in the 25 years between 1990 and 2015 due to maternal causes (6). Over the course of that time, however, the world has made steady progress in reducing maternal mortality(WHO, UNICEF, UNFPA, Group, & Nations, 2015). In 2015, an estimated 303,000 women died as a result of pregnancy and childbirth-related complication worldwide. Developing countries accounted for about 99% of global maternal deaths, with the maternal mortality ratio (MMR) of 239 per 100,000 live births. Despite an apparent global improvement made over the last two and half decades, the worldwide MM dropped by about 45% in 2015 which is far from the decline targeted (75%) to be achieved by 2015(WHO et al., 2015).

Moreover, majority of the countries with the highest maternal mortality are in sub-Saharan Africa, including Ethiopia (UNs, 2015). In EDHS 2016, the maternal mortality ratio in Ethiopia was estimated at 412 deaths per 100,000 live births. Most of these deaths occur unpredictably during labor, delivery, and the immediate postpartum period(EDHS & ICFI, 2016a, 2016b).Ethiopia as one of the sub-Sahara country maternal care is extremely poor. According to EDHS 2011 and 2016 only 34% and 62 % of women who gave birth in the five years preceding the survey received antenatal care from a skilled provider respectively one woman in every five (19%) made four or more antenatal care visits during the course of her pregnancy(EDHS & ICFI, 2016a, 2016b).

Many health problems during pregnancy can be prevented, detected and treated by trained health workers during antenatal care visits if the mother come on time or timely first antenatal visit (Jody RL, 2012).

The more helpful in preventing adverse pregnancy outcomes is antenatal care when it is received early in the pregnancy and continued through delivery. Under normal condition, World Health Organization recommends that a woman without complications should have at least four antenatal care visits, the first of which should take place during the first trimester (Tsegay et al., 2013.; WHO, 2014).

Failure to attend antenatal care early results in the potential for complications during pregnancy, delivery, and puerperium (WHO, 2005).

However, existing evidence from developing countries including Ethiopia indicates that few women seek antenatal care at early stage of their pregnancy.(international., 2016)

According to Ethiopia Demographic Health Survey 2011 report only 11% made their first ANC visit before the fourth month of pregnancy.

Study in Debra Berhan town, central Ethiopia revealed that only 26.2% of pregnant mothers started ANC visit early in the recommended time and another study in Ambo town showed that only 13.2% of the study respondents were started ANC timely (in the first trimester of pregnancy(Amtatachew M, Zegeye Bitew, D, & Koye, 2013; Tolera, Workineh, & Gmariam, 2015)

Many studies have identified several factors that influence the utilization of antenatal care in developing countries, although there are few studies regarding factors affecting the timing of first

ANC attendance. These factors include, among others, maternal education, husband's education, availability of health service, cost, household income, women's employment, media exposure,(Achia & Mageto, 2015; B et al., 2008; Teferra, Alemu, & M.Woldeyohannes, 2012.)and having a obstetric history like parity and mother's undesired child birth outcome; past experience of service like previous service utilization, perceived quality of service, cost of the service; awareness of care and pregnancy related complications; and other factors like influence of husband, wanted or unwanted pregnancy, unrecognized symptoms of pregnancy, and fear of parents were found to be predictors that either positively or negatively influence timing of ANC booking(Mekonnen & A, 2007).

Therefore, Timely ANC is generally acknowledged to be an effective method of preventing adverse outcomes of pregnancy and 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. So this study intended to assess timing of first antenatal care visit and associated factors among pregnant women attending ANC clinic in Asella town public health institutions, 2017.

According to Anderson and Newman Socio-behavioral model which was used to conceptualize this study, individual's access to and use of health services is considered to be a function of three characteristics. These are predisposing factors (the socio cultural characteristics of individuals that exist prior to their need of health service), enabling factors (the logistical aspects of obtaining care) and need factors (the most immediate cause of health service use, from functional and health problems that generate the need for health care services)

So, these three factors can affect directly the timing of first ANC visit and socio demographic factors can affect knowledge as well as income, husband involvement and cost of the service.

General objective

To assess factors associated with timely booking of first antenatal care visit among pregnant women attending ANC clinics in Asella town public health institutions, Ethiopia, 2017.

Specific objectives

To determine time of first antenatal care visit among pregnant women attending ANC service in the study area

To identify factors associated with timely first antenatal care visit among pregnant women attending ANC service in the study area.

METHODS

Study Area

The study was done in Asella town, Arsi zone Oromia Regional state. It is situated along 175 kilometers from Addis Ababa city. The town covers an area of 29.3 Square kilometers. The town is inhabited by people of different ethnic groups with diverse cultural back grounds. According to Asella city administrative 2012 bulletin report the total population is 74,268, from this Oromo accounts 34,989 and Amhara, 30,785,Gurage 3000, Silte 2000and 3,494 are others the dominated languages are Afan oromo followed by Amharic (Administration, 2012).

Asella town have six health facilities one is government hospital, one private hospital, two health centers, and two NGO family health clinics. Since my working area is in Asella town I make it my starting place.

Study design and study period

Institution based cross sectional study design was used from March 1, 2017- April 10, 2017

Source population

All pregnant women attending Asella public health institutions from March 1, 2017- April 10, 2017

Study population

Pregnant women who were attended ANC Clinics in Asella town during data collection period

Study Subjects

All pregnant women attending ANC during study period

Inclusion and Exclusion criteria

Inclusion criteria

All pregnant women who are attending antenatal care service in Asella town that come to health institutions during data collection period.

Exclusion Criteria

Pregnant women, who are- unable to hear and speak,

Sample size determination

The sample size was calculated by using single population proportion formula based on the following assumptions: Proportion of timely ANC visit was taken 27.1(Mekdes, Tumebo, Gultie, Megersa, & Yirga, 2015) Significant level at α= 0.05, at 95% confidence interval, Margin of error is 5%.and 10% nonresponse rate, total of 334pregnant women were recruited as study units among pregnant women who attended ANC follow up at health facilities in Asella town during study period.

Sampling procedure

In this study, all health institutions which provide ANC service were selected. Based on these, three public health institutions, (one hospital and two health centers) were included. Final sample size (334) is obtained by proportionally allocating to these selected health facilities by considering their monthly ANC follow up. Lastly, subjects (pregnant mother) were taken by systematic Random sampling.

Variables of the study

Dependent variable

Timing of first antenatal care visit

Independent variables

Socio demographic characteristic of individual (age of mother, marital status, occupation, educational status residence), previous use of service, parity, knowledge on timing of first ANC, monthly income, distance from health service, waiting time, cost of service, husband involvement

Operational definition

Timely ANC booking: booking first ANC before fourth month of pregnancy).

Lately ANC booking: booking first ANC within fourth to ninth month of pregnancy(WHO, 2002b).

Data collection tool

Data was collected using standardized and pretested questionnaires by interviewing pregnant mothers. The tool was adapted from Safe motherhood and modified from previous done researches. It has six parts, which is open to use and the author is acknowledged(Abebe, 2014; Amtatachew M et al., 2013). The first part is sociodemographic characteristics , second part is Knowledge of ANC, third part is current pregnancy and experience of health services utilization, fourth part is obstetric history of the mother, fifth part is Health service related and sixth part is women decision making .The data collection tool was first prepared in English and then translated to Afan oromo (local language) and Amharic .Then first and the second versions of

the tool was retranslated back in to the original one by language experts to evaluate its consistency. Edited final versions both Afan oromo and Amharic of questionnaires was used to collect data from respondents.

Data entry and Analysis procedure

After data collection, the questionnaire was checked for completeness and data entry was made by the principal investigator. The collected data was entered in to Epi-info version 7 and exported to Statistical Package for Social Science (SPSS) version 22 for analysis. A logistic regression was used to identify the association of the independent variables on the dependent variable and then multivariate logistic regression was used to control cofounders and statistically significant associations in between variables. And also descriptive statistics was applied to describe mean and SD. Lastly, Significant of statistical association was assured or tested using 95% confidence interval (CI) and p value (<0.05).

Data collection procedure

Interview technique was used to collect data with structured and pretested questionnaire.

Three degree midwives were recruited from other health facility in respect to his/her experience of data collection and communication skills with pregnant mothers for data collection. One day training was given for data collectors and supervisors concerning the research objective, data collection tools and procedures, and interview methods that are supposed to be applied during data collection based on prepared training manual. Trained data collectors were collected data at health facility using revised version of data collection tool from March – April, 2017 and they were interviewed the pregnant women waiting after they completed their daily visits.

Supervisors were carried out regular supervision, spot-checking and reviewing the completed questionnaire daily to maintain data quality. The overall activity was coordinated by the principal investigator.

Pretest was done at Gonde health center, Asella ZuriyaWoreda before conducting the major study on about 5 percent of the sample to check validity and reliability of questionnaire.

Data quality assurance

To assure the quality of data, the questionnaire was pre-tested. Training was given for the data collectors (BSC Midwifes) how to interview and check the questionnaires for completeness during collecting data. The supervisors and principal investigator were checked and reviewed the completeness of questionnaires and were offered necessary feedback to data collectors.

Ethical clearance

Ethical clearance was assured prior to data collection from Institutional Review Board of Addis Ababa University, College of Health Sciences, Nursing and Midwifery Department, Also authorization was obtained from Health Bureau of Asella City Administration and Directors of all health facilities. The pregnant women were provided information by data collectors after they asked for willingness and verbal consent was obtained before data collection. Each study participants (pregnant women) were informed about the purpose, methods of collection, anticipated benefit and risk of study by the data collectors. Privacy and confidentiality was maintained throughout the data collection, analysis and result dissemination.

RESULT

Response coverage

Out of the total 334, 324 pregnant women were participated in the study from 334 total populations and making 97% response rate.

Socio demographic characteristics of respondents

Out of 324 (97%) respondents, the majority, 263(81.2%) of participant mothers were between 20 and 34. The mean and standard deviation age of participant was 26.8(-/+ 4.8). Three hundred one (92.9%) mothers were married and 132 (40.7%) were daily laborer.

The ethnic composition of study participants showed that Oromo (65.7%) were the dominant group followed by Amhara (26.9%). The majority of participants152 (46.9%) Muslim followers and followed by Orthodox 109 (33.6%), Protestant 59 (18.2%) and Catholic 4(1.2%).

Regarding educational status of the mother, majority 172 (53.1%) were attended primary school and (14.2%) can't read write. Majority of the respondents 200 (61.7%) were Urban residents.

Nearly greater than half of pregnant women (58%) had monthly income of above 1000 ETB. (**Table 1**)

Table: 1 Socio demographic characteristics of pregnant women in Asella Town, May 2017.

Socio demographic variables of mother		Frequency (n= 324)	Percentages (%)
Age of mother	15-19	26	8.0
	20-24	71	21.9
	25-29	129	39.8
	30-34	80	24.7
	35-39	16	4.9
	40-44	2	0.6
	45-49	0	0
	Total	**324**	**100**
Residence	Rural	118	36.4
	Urban	206	63.6
	Total	**324**	**100**

	Orthodox	109	33.6
Religion	Muslim	152	46.9
	Protestant	59	18.2
	Catholic	4	1.2
	Total	**324**	**100**
	Oromo	213	65.7
Ethnicity	Amhara	87	26.9
	Tigre	20	6.2
	Gurage	2	.6
	Others #	2	.6
	Total	**324**	**100**
	Can't read and write	46	14.2
Educational status of the mother	primary(1-8)	172	53.1
	secondary (9-12) &above	106	32.7
	Total	**324**	**100**
Occupational status	Government employed	79	24.4
	Private employed	23	7.1
	Merchant	54	16.7
	House wife	26	8.0
	Daily laborer	132	40.7
	Other##	10	3.1
	Total	**324**	**100**
Family monthly income	< 500	61	18.8
	500-1000	75	23.1
	>1000	188	58
	Total	**324**	**100**

NB: ("**#: silte, Wolayita, ##: Student, waiter**)

Concerning the marital status of the respondents as shown on the above graph, majority of them respondents were married (92.9%) followed by single (5.6%).

Knowledge of respondents on timing of first ANC booking

Out of total respondents, two hundred eighty nine (92%) reported that ANC service is important and 26(8%) didn't know its importance. Around two hundred sixty three (81%) and 228 (70%) respondents knew as early booking of first ANC improve health of the mother and also improve fetal outcome respectively.

Concerning the knowledge of appropriate time to begin first ANC only 123(38%) mother reported that it should be within first trimester (<4th months) and 201(62%) after first trimester (>4th months).

One hundred eighty eight (58%) participants were responded as four ANC visit is needed for pregnant women during normal pregnancy.

Out of the three hundred twenty four respondents around 224 (69.1%) mothers reported that all pregnant mothers are at risk of pregnancy complications and 63.6% mother responded that there is no difference between primi and multiparous in timing of first ANC.

Obstetric history

Among the total participants, 258 (79.6%) had experienced birth and from these mothers, 211 (65.1%) were multi para who gave birth two and above and about 47 (14.5%) were primipara and para zero. Still birth accounted around 52 (16%) from the total birth and abortion accounted twenty two (6.8%) from the total respondents. From the total mothers who gave in the previous time nearly half of them 173 (53.4%) had ANC follow up and around 159 (49.1%) of these adviced when to start first ANC for the next pregnancy (Table 3).

History of current pregnancy, health service related and experience of service utilization

Majority of the respondents pregnancy was planned, 238 (73.5%) whereas around 86(26.5%) of pregnancy was unplanned and about 27(8.3%) pregnancy was unwanted.

From the total respondents about 60(18.5%) pregnant mothers initiate ANC visit because of medical complications of pregnancy. One hundred twenty four (38.3%) respondents had no information about timing of first ANC booking.

Majority of the respondents, 248(76.5%) complaining that waiting long time can hinder timing of first ANC booking, whereas about 76(23.5%) didn't agree. About two hundred one (62%) respondents reported that as they hadn't asked payment for the service they received, while 123(38%) of them complain payment for the service.

Out of the total respondents , one hundred thirty four (41.4%) mothers pay greater than five birr for transportation whereas 78(24.1%) pay 1-5 birr and 112(34.6%) hadn't paid transportation cost because they came from nearby health facility.

From the total participants 324, about 74(22.9%), 162(50%) and 153(47.2%) women were not satisfied on staff approach, privacy and service charge respectively.

Timing of first ANC booking

Out of 324 respondents only 120(37%) pregnant women booked timely (within first trimester) while 204(63%) were booked lately, after first trimester. The mean Gestational age of booked respondents was 21.2 weeks with standard deviation of 6.8 weeks and timing of first ANC booking ranged from four weeks to thirty six weeks. (Figure.1)

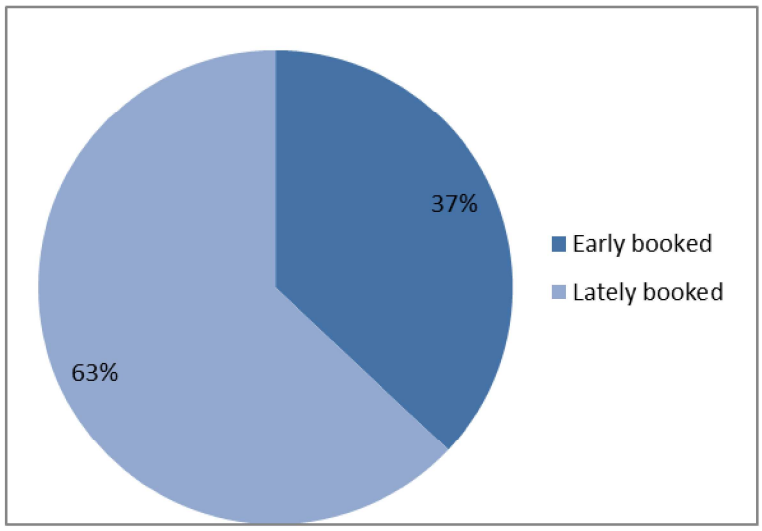

Figure 1: Timing of first Antenatal care booking among pregnant women in Asella Town, May 2017.

The above figure showed that the pattern of ANC from 4th weeks to 36th of pregnancy, the peak weeks for initiating first ANC was at 16th weeks of and few at 4th of gestational age.

Husband involvement and women decision making on timing of first ANC booking

From the total 324 respondents booked for First ANC visit , 257(79.3%) women were made decision with their husband on timing of first ANC booking and around 67(20.7%) didn't make decision.

Association of 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. After controlling the confounding factors, the multivariate revealed that the following factors have association with timing of first ANC booking: Husband involvement in timing of ANC booking, Medical complications during pregnancy, had birth experience, got information when to book ANC, Perceived right time to book and asked payment for service.

Those women who made decision with their husbands 8 times more likely (AOR=8.17, 95% CI 3.15, 21.00) to initiate first ANC timely than who didn't. Mothers who faced pregnancy complication were 2.8 times more likely start first ANC early than their counter parts. Mothers who had experienced at least birth were 2.5 times more likely to book first ANC timely than para zero. Mothers who didn't informed about the timing of first ANC booking was 0.31 less likely (AOR=0.31, 95% CI 0.178-0.54) to initiate ANC within recommended time than their counter parts. Pregnant women who were asked payment for ANC service were 0.56 less likely (AOR=0.56, 95% CI 0.35 -0.88,) to start first ANC timely. Those mothers who complaining long

waiting time to get the service were 0.56less likely (AOR=0.56, 95%CI, 0.32, 0.98)to booked timely than who get free service (Table.3).

Table: 2 Multivariate analysis (Association of selected factors by timing of first ANC booking in Asella town, May 2017

Variable		Early booked(n)	Lately booked(n)	Crude OR 95% CI	Adjusted OR 95% CI	P-value
Age	15-19	13(50%)	13(50%)	1		
	20-24	29(40.8%)	42(59.2%)	1.45 (0.587-3.572)		
	25-29	51(39.5%)	78(60.5%)	1.53(0.656-3.564)		
	30-34	18(22.5%)	62(77.5%)	**3.44(1.358-8.737) ***	3.81(1.35-10.76)	**0.012****
	35-39	7(43.8%)	9(56.2%)	1.29(0.368-4.495)		
	40-44	2	0			
Husband involvement	Yes	115(44.4%)	144(55.5%)	**9.58(3.7-24.6) ***	8.17(3.15-21)	**0.0001****
	No	5(7.7%)	60(92.3%)	1		
Preg related cmplxn.	Yes	8(13.3%)	52(86.7%)	**4.79(2.19-10.48) ***	2.83(1.21-6.58)	**0.016****
	No	112(42.4%)	152(57.6%)	1		
Birth experience	Yes	86(33.3%)	172(66.7%)	**2.13(1.23-3.68) ***	2.54(1.42-4.56)	**0.002****
	No	34(51.5%)	32(48.5%)	1		
Appropriate time to begin ANC knlwg	Within 1st TM	79(64.2%)	44(35.8%)	**7.01(4.23-11.59) ***	5.6(3.32-9.45)	**0.0001****
	After 1st TM	41(20.4%)	160(79.6%)	1		
Informed about timing of ANC	Yes	93(46.5%)	107(53.5%)	1		
	No	27(21.8%)	97(78.2%)	**0.32(0.193-0.533) ***	0.306(0.175-0.536)	**0.0001****
Payment for service	Yes	65(44.5%)	81(55.5%)	**0.557(0.353-0.879) ***	0.534(0.319-0.895)	**0.017****
	No	55(30.9%)	123(69.1%)	1	1	
Waiting time	Yes	82(33.1%)	166(66.9%)	**0.494(0.293-0.832)**	0.557(0.318-0.977)	**0.041****
	No	38(50%)	38(50%)	1	1	

Keys: *Statistically significant at p<0.2 in Bivariate, 1=Reference category **statistically significant at p<0.05 in multivariate

DISCUSSION

This facility based cross sectional study was conducted to assess the timing of first Antenatal care booking and associated factors. The findings of this study revealed that 37 % were booked timely (within fourth month) while 63% were booked lately (within fourth month of pregnancy and above).

Booking of first Antenatal care ranges from four weeks to thirty six weeks of pregnancy. The mean gestational age the respondent booked was 21.2 weeks and with standard Deviation of 6.8weeks.

World Health Organization recommends that pregnant mothers shall start ANC booking in the first trimester (before four months) of pregnancy(WHO, 2002b). However, in this study nearly two-third (63%) respondents were made ANC booking beyond the recommended time, only 37% were started timely.

This finding is lower than study shown in Indonesia (80%), Malasia (56.2%) and Addis Ababa (40.2%)(Agha & Tappis, 2016; Hodge, Firth, Marthias, & Jimenez-Soto, 2014; Tariku, Melkamu, & Kebede, 2010).This inconsistency may be due to socio demographic characteristic difference between Addis Ababa and Asella town. But, this result is higher when compared with study done in Ambo (13.2%) (Tolera et al., 2015) and EDHS 2011(11%). This inconsistency may be due to the time gap of the Research done in Ambo and almost EDHS covered remote (rural) areas of the country and may be due to sample size or study design. On the other hand this finding is nearly in line with study conducted in Dilla (35.4%) and in Gonder (35.1%)(Abebe, 2014; Belayneh, Adefris, & Andargie, 2014).

In this study, husband involvement was highly associated with timely initiation of first ANC booking. Involvement of the husband was positively influencing timely initiation of first ANC booking. This finding was in line with study conducted in Pakistan, which reported that lack of permission or discussion from husband hinders the ANC service(Sadiq et al., 2011). Also study in Namibia and Kenya indicated that, decision making of wife only or husband only is associated with less ANC utilization as compared to joint decision making(Namasivayam, Osuorah, Syed, & Antai, 2012). And also supported by study in Dilla Town(Abebe, 2014),this might be due to the fact that when mothers supported by their husbands, they seek health care timely, due to financial and psychological issues. But inconsistent with the study done Uganda, which indicated that timing and frequency of ANC visits were significantly associated with mother's autonomy in taking health decision(Kisuule et al., 2013). This inconsistency may be due to socio cultural difference between Ethiopian society and Ugandan society, there may be autonomy of the women well practiced.

The present study revealed that mothers who faced pregnancy related complication during pregnancy were more likely (AOR=2.83, 95% CI 1.21, 6.58) to initiate first ANC booking early than their counter parts. This study is supported by study conducted in Nigeria(Mangeni, Nwangi, Mbugua, & Mukthar, 2014) but inconsistent with study done Debra Berhan, indicated pregnancy related complication for current pregnancy was not significantly associated with early ANC visit(Amtatachew M et al., 2013). This variation may be due to Time gap of the study, socio cultural difference and sample size.

In this study, mothers who had experienced at least one birth were more likely (AOR=2.54, 95% CI 1.42, 4.56) to book first ANC early within recommended time when compared with their referents. This result is consistent with the study done in Nigeria(Ifenne & Utoo, 2012), whereas another finding from Debra berhan, Hadiya and Dilla contradict this study(Abebe, 2014; Amtatachew M et al., 2013; Mekdes et al., 2015). The possible reason may be, mothers who gave birth at least once well counseled about danger sign of pregnancy and appropriate time when to start first ANC booking for the next pregnancy, or due to socio cultural difference and time gap of the research done.

Another association was observed between pregnant mothers' perception of right time to start first ANC and timely booking for ANC. Mothers who knew the right time to be within 4th months were more likely (AOR=5.6, 95% CI 3.32, 9.45) to start first ANC early than those who perceived the right time beyond 4th months of pregnancy. This finding is similar with the study done in Uganda ,indicated that around of participants didn't know the right gestational age at which a pregnant woman should start attending ANC(Jennifer et al., 2015) also study done in Debra Berhan supported this finding(Amtatachew M et al., 2013).This might be due to, those who know the exact time come early than without information.

Finding in this study indicated that pregnant mothers who didn't informed about the timing of first ANC booking was less likely to start first ANC booking within recommended time than their counter parts. This study is supported by study conducted in Kham District, Japan(Jennifer et al., 2015), Nigeria (Ifenne & Utoo, 2012) also consistent with study done in Ethiopia (Debra Berhan) and Dilla (Abebe, 2014; Amtatachew M et al., 2013).

Finding observed in this study indicated that those mothers who have asked payment for ANC service were less likely to start first ANC booking early than those who received free service. This finding is in line with the study done in Tanzania and Ghana(Arthur, 2012; Mubyazi, 2010).

Another multivariate analysis was revealed that association between long waiting time and timely first ANC booking. Those mothers who complaining long waiting time for getting the services were less likely to start first ANC booking early than those who didn't complain. This result is supported by the study done in Kham District(Jennifer et al., 2015) and Dilla Town(Abebe, 2014) long waiting time is one of the hindrance of early booking of first ANC visit.

CONCLUSION AND RECOMMENDATION

Conclusion

In conclusion, timing of the first ANC booking was relatively low.Maternal decision making with her husband on initiation of timely first ANC booking ,Facing pregnancy related complications, previous history of birth experience, Having knowledge or being informed on the

right time to start first ANC visit, payment for service and waiting time were significantly associated with timely first ANC booking.

Recommendation

Asella town, health office should strengthen and maintain local information dissemination network on antenatal care and should develop a detailed and clear guideline and structure that will advance knowledge of reproductive age women on timing of Antenatal care.

Community based information education and communication on ante natal care and its right time of commencement should be organized and implemented by HEW.

Health care providers should give appropriate information on the importance of the early ANC visit need to be emphasized at the time of service provision.

Lists of Abbreviations

AOR Adjusted Odd Ratio

ANC Antenatal Care

CI Confidence Interval

COR Crude Odd Ratio

EDHS Ethiopian Demographic Health Survey

HC Health Center

MMR Maternal Mortality Ratio

MDG Millennium Development Goal

NGO Non-governmental Organization

SPSS Statistical Package for Social Sciences

SD Standard Deviation

WHO World Health Organization

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Conflicts of interest

The authors declared that they have no competing interests

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References

(GHO), WHO Global Health Observatory. (2011.). Antenatal care-situations and trends. .

Abebe, Alemu. (2014). *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.* AAU.

Achia, T. N., & Mageto, L. E. (2015). "Individual and contextual determinants of adequate maternal health care services in Kenya," *Women & Health, 55*(2), 203–226.

Administration, Asella City. (2012). Asella city Admininstration Bulletin of population report.

Agha, Sohail, & Tappis, Hannah. (2016). The timing of antenatal care initiation and the content of care in Sindh, Pakistan. *BMC Pregnancy and Childbirth, 16*(1), 190.

Amtatachew M, Zegeye Bitew, D, Bikes, & Koye, Digsu N. (2013). Prevalence and determinants of early antenatal care visit among pregnant women attending antenatal care in Debre Berhan Health Institutions, Central Ethiopia. *African journal of reproductive health, 17*(4).

Arthur. (2012). Wealth and antenatal care use: implications for maternal health care utilisation in Ghana. Health Economics Review2012 *Springer open, 2*(14).

B, Simkhada, E, Teijlingen, M, Porter, & P., Simkhada. (2008). Factors affecting the Utilization of antenatal care in developing countries: systematic review of the literature. . *J Adv Nurs., 619*(3), 244-260.

Belayneh, Tadesse, Adefris, Mulat, & Andargie, Gashaw. (2014). Previous early antenatal service utilization improves timely booking: Cross-sectional study at university of Gondar Hospital, northwest Ethiopia. *Journal of pregnancy, 2014*.

EDHS, & ICFI. (2016a). Ethiopia Demographic and Health Survey 2016, Central Statistical Agency, Addis Ababa, Ethiopia. *ICF International, Calverton, Md, USA*.

EDHS, & ICFI. (2016b). Ethiopia Demographic and Health Survey , Central Statistical Agency, Addis Ababa, Ethiopia.

Hodge, Andrew, Firth, Sonja, Marthias, Tiara, & Jimenez-Soto, Eliana. (2014). Location matters: trends in inequalities in child mortality in Indonesia. Evidence from repeated cross-sectional surveys. *PLoS One, 9*(7), e103597.

Ifenne, Dennis Isaac, & Utoo, Bernard Terkimbi. (2012). Gestational age at booking for antenatal care in a tertiary health facility in north-central, Nigeria. *Nigerian Medical Journal, 53*(4), 236.

international., ICF. (2016). Central statistical Agency EDHS, Addis Ababa (pp. 119-127).

Jennifer, Toki, Fillman, Akira Shibanuma, KyiMarWai, MasamineJimba, NweNweOo, & Saw., Yu Mon. (2015). Are Husbands Involving in Their Spouses'Utilization of Maternal Care Services.Japan,. *PLoS Med*.

Jody RL, Amy SE. (2012). A critical analysis of maternal morbidity and mortality in Liberia, West Africa. Midwifery (28), 67-72.

Kisuule, Ivan, Kaye, Dan K, Najjuka, Florence, Ssematimba, Stephen K, Arinda, Anita, Nakitende, Gloria, & Otim, Lawrence. (2013). Timing and reasons for coming late for the first antenatal care visit by pregnant women at Mulago hospital, Kampala Uganda. *BMC Pregnancy and Childbirth, 13*(1), 1.

Mangeni, JN, Nwangi, A, Mbugua, S, & Mukthar, VK. (2014). Male involvement in maternal healthcare as a determinant of utilisation of skilled birth attendants in Kenya. *East African medical journal, 89*(11), 372-383.

Mekdes, Kondale, Tumebo, T, Gultie, T, Megersa, T, & Yirga, H. (2015). Timing of First Antenatal Care Visit and associated Factors among Pregnant Women Attending Anatal Clinics in Halaba Kulito Governmental Health Institutions. *J Women's Health Care, 5*(308), 2167-0420.1000308.

Mekonnen, Y, & A, Mekonnen. (2007). Utilization of maternal health care services in Ethiopia. ORC Macro Maryland U.S.A, 2002. *URL: http:// www.measuredhs.com*.

Mubyazi. (2010). Women's experiences and views about costs of seeking malaria chemoprevention and other antenatal

services: a qualitative study from two districts in rural Tanzania. . *Malaria journal, 9*(54).

Namasivayam, Amrita, Osuorah, Donatus C, Syed, Rahman, & Antai, Diddy. (2012). The role of gender inequities in women's access to reproductive health care: a population-level study of Namibia, Kenya, Nepal, and India. *Int J Womens Health, 4*, 351-364.

Sadiq, Namrah, Waheed, Quratulain, Hussain, Mehreen, Rana, Ali Tahir, Yousaf, Zareen, Chaudry, Zunash, . . . Iqbal, Saima. (2011). Factors affecting the utilization of antenatal care among women of reproductive age in Nurpur Shahan. *JPMA. The Journal of the Pakistan Medical Association, 61*(6), 616-618.

Tariku, Alemayehu, Melkamu, Yilma, & Kebede, Zewditu. (2010). 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. *Ethiopian Journal of Health Development, 24*(3).

Teferra, A. S., Alemu, F. M., & M.Woldeyohannes, S. (2012.). "Institutional delivery service utilization and associated factors among mothers who gave birth in the last 12 months in Sekela District, North West of Ethiopia: a community—based cross sectional study," *BMC Pregnancy and Childbirth, 12*(74).

Tolera, Gudissa, Workineh, Desta, & Gmariam, Abebe. (2015). Time of Antenatal Care Booking and Associated Factors Among Pregnant Women Attending Ambo Town Health Facilities, Central Ethiopia. . *Journal of Gynecology and Obstetrics, 3*(5), 103-106. doi: 10.11648/j.jgo.20150305.12

Tsegay, Y., Gebrehiwot, T., Goicolea, I., Edin, K., Lemma, H., & Sebastian, M. S. (2013.). "Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: a cross-sectional study,". *International Journal for Equity inHealth, 12*(30).

UNs. (2015). The Millennium Development Goals Report New york.

WHO. (2002a). UNDP(UNFPA/WHO/World Bank Special programme of Research, Development and RHR, Family and community health ,WHO,Geneva ,2002. Geneva: WHO.

WHO. (2002b). UNDP(UNFPA/WHO/World Bank Special programme of Research, Development and RHR, Family and community health ,WHO,Geneva ,2002. Geneva: WHO.

WHO. (2005). The World Health Report 2005: Make Every Mother and Child Count . Geneva, Switzerland: World Health Organization.

WHO. (2014). Trends in Maternal mortality 1990–2013, Estimates by WHO,UNICEF, UNFPA, the World Bank, and the United Nations Population Division. Geneva, Switzerland: World Health Organization.

WHO, UNICEF, UNFPA, Group, World Bank, & Nations, United. (2015). Trends in maternal mortality:1990 to 2015 Estimates by Population Division.