Timing of First Antenatal Care Attendance and Associated Factors among Pregnant Women at Public Health Facilities of Hawassa City, Sidama, Ethiopia

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Abstract

Background: Timely initiation of antenatal care can reduce pregnancy-related problems and save the lives of mothers and babies. The African region has large intraregional disparities in terms of coverage of basic maternal health interventions like antenatal care. This study was aimed at assessing the timing of first antenatal care and associated factors among pregnant women who attend antenatal care clinics at public health centers in Hawassa city. **Methods:** An institution-based cross-sectional study was carried out in Hawassa city public health centers from September 1 to 30, 2022. A total of 235 randomly selected mothers who attend at ANC clinic were included in the study. An interviewer-administered questionnaire was used to collect the data. Descriptive statistics was used to summarize the data. A logistic regression model was used to analyze the data using statistical package for social sciences version 26. An adjusted odds ratio with a 95% confidence interval and a corresponding p-value <0.05 was used to determine factors associated with the outcome variable. **Result:** Among the respondents, 173 (73.6%) initiated their first antennal care after 16 weeks of gestation, and 62 (26.4%) initiated it before 16 weeks of gestation. Having no information about ANC service (AOR=0.06, 95% CI: 0.01, 0.58, (late previous first antenatal care attendance (AOR=0.037, 95% CI: 0.01, 0.11), and unplanned pregnancy (AOR=0.07, 95% CI: 0.01, 0.39) were significantly associated with late antenatal care. **Conclusion:** The prevalence of late first antenatal care was high in the study area. We have identified different factors affecting the late antenatal care visit. Interventions should focus on reducing those risk factors.

Keywords: Associated factors; Antenatal care; Late ANC initiation; Hawassa

Introduction

Antenatal Care (ANC) is defined as the care provided by skilled health care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy [1]. The components of ANC are risk identification, prevention and management of pregnancy-related or concurrent diseases, health education, and health promotion. The World Health Organization (WHO) recommends that pregnant women in developing countries initiate early prenatal care before the end of the fourth month of pregnancy. ANC in the first trimester is fundamental and decisive in identifying and evaluating the risk factors usually present before pregnancy [2]. However, in developing countries, the coverage and early initiation of ANC are lower than in developed countries. A significant number of pregnant women started their first ANC visit during the second and third trimesters because of different factors in different developing countries [3].

Worldwide, 85 percent of pregnant women received antenatal care with skilled health care providers at least once, and only 49 percent received at least four antenatal visits in sub-Saharan Africa [4]. Globally, more than half a million women are still dying annually as a result of complications of pregnancy and childbirth, and ninety-nine percent of these occur in developing countries [5]. Of these deaths, 50 percent occurred in sub-Saharan Africa [6]. According to the 2016 Ethiopian Demographic and Health Survey Report (EDHS), 62 percent of women who gave birth in the five years preceding the survey received antenatal care from a skilled health care provider at least once for their last birth, and only 32 percent had four or more ANC visits for their most recent live birth [7]. The lifetime death risk of a woman from pregnancy-related causes in sub-Saharan Africa is 1 in 16, which is 500 times higher than for a woman in northern Europe [8].

Age, a woman's place of residence, level of education, employment status, intention to get pregnant, economic status, health insurance, parity, and traveling time are among the most cited factors related to late ANC visits.

Proper care during pregnancy and delivery is important for the health of both the mother and the baby. Antenatal care from a skilled provider is important to monitor pregnancy and reduce morbidity and mortality risks for the mother and child during pregnancy, delivery, and the postnatal period. In developing countries, however, only 50 percent of pregnant mothers receive the recommended number of antenatal care visits and start late in their pregnancy. To our knowledge, there are limited studies conducted on ANC and its associated factors in the study area. Thus, the aim of this study was to assess the magnitude and factors associated with the timing of antenatal care attendance in Hawassa city, Sidama, Ethiopia.

Materials and Methods

Study setting and design

A facility-based cross-sectional study was conducted at Hawassa city, the capital of the Sidama region, which is located 275 kilometers south of Addis Ababa. The total population of the city is 394,057. There are 4 public hospitals (Hawassa University Comprehensive Specialized Hospital, Adare General Hospital, Motite Primary Hospital, and Tula Primary Hospitals), 4 non-governmental hospitals, 11 governmental and 1 non-government health centers, and 7 diagnostic laboratories in the city [9]. Of these, three randomly selected health centers were included in the study.

Study population and sample size

Mothers who were following ANC at the health centers of Hawassa city administration were included in the study. Women who were mentally and physically incapable of being interviewed, including those who were ill, were excluded from the study. Three health centers (Tula, Alamura, and Millennium) were randomly selected among the eleven

health centers found in the city. A systematic random sampling technique was used to select study participants. A single population proportion formula was used to calculate the sample size. Using the assumptions, the level of significance is 5%, the margin of error is 5%, and the prevalence of late initiation of ANC is 82.6% [10]. A contingency of 10% was considered for non-respondents. Finally, a total of 235 pregnant mothers participated in the study.

Data collection tools and procedures

The questionnaire was developed after reviewing literature that has similar study objectives and the EDHS tools. The questionnaire was developed in English first and then translated into Amharic by a translator to ensure its consistency. Finally, it was translated back into English. A structured questionnaire, which contains questions on the socio-demographic characteristics of the mothers, their knowledge of ANC, their past history of ANC service utilization, their current pregnancy, their current utilization of antenatal care, and the timing of their first ANC-related measures, was used to collect the data. The timing of the ANC visit was explained as a categorical variable with two possible values: Early beginning of the ANC ("yes") or late initiation ("no") of the ANC visit. Information regarding the study was explained to study participants before the interview. Data was collected from mothers through direct interviews conducted in Amharic face-to-face at the exit of the ANC clinic. Data collection was conducted by four trained BSc midwives on day and night rotations to address the assigned sample size. To minimize bias and ensure the high quality of the information, training was given to data collectors and supervisors. Before data collection, 5% of the sample was pretested, and corrections were made outside of the study area. Throughout the data collection process, monitoring of the data collection, timely feedback, and checking for questionnaire completeness and consistency were done.

Statistical analysis

The data cleaning and analyses was done using the Statistical Package for Social Science (SPSS) version 26. Descriptive statistics was used to summarize the data. Logistic regression model was used to analyze the data. Bivariable analysis was conducted to identify candidate variables for the final model, considering p-value <0.25. An Adjusted Odds Ratio (AOR) with a 95% confidence interval was used to determine factors associated with the outcome variable with a p-value <0.05, to declare statistical significance.

Results

Socio demographic characteristics of the study participants

A total of 235 study subjects participated in this study, with a response rate of 100%. The mean age of the respondent was 27 years, and it ranges from 15 to 39 years. The majority of

the respondents, 89 (37.9%), were in the age group of 25-29 years. Regarding their ethnicity, about 105 (44.7%) was Sidama, followed by Wolyta, which was 57 (24.7%). More than half of the respondents, 133 (56.6%) were Protestant, 76 (32.3%) were Orthodox, 19 (8.1%) were Muslims, 3 (1.3%) were Catholic, and others were 4 (1.7%). Out of 235 respondents, 232 (98.7%) were married, 2 (0.9%) were unmarried, and the rest (1.4%) were widowed.

More than half of the respondent's educational level was secondary school (9-12 grade) and college (university), which accounts for 87 (37.0%) and 75 (31.9%), respectively. The net incomes of 185 (78.7%) respondents were greater than 2000 ETB, and only 12 (5.1%) respondents' incomes were found to be between 500 and 1000 ETB per month (Table 1).

Table 1: Socio-demographic characteristics of pregnant women who come for the first ANC visit in three selected health centers from September 1 to 30, 2022, n=235.			
Variables	Categories	Frequency (n)	Percent (%)
Age of the mother	15-19	9	3.8
	20-24	74	31.5
	25-29	89	37.9
	30-34	46	19.6
	≥ 35	17	7.2
Ethnicity	Sidama	105	44.7
	Wolyta	57	24.3
	Oromo	GD16	6.8
	Amhara	29	12.3
	Gurage	20	8.5
	Other	8	3.4
Religion	Orthodox	76	32.3
	Protestant	133	56.6
	Muslim	19	8.1
	Catholic	3	1.3
	Other	4	1.7
Marital status	Married	232	98.7
	Unmarried	2	0.9
	Widowed	1	0.4
Education of women	Illiterate	8	3.4
	Primary school (1-8 grade)	65	27.7
	Secondary school (9-12 grade)	87	37
	College/University	75	31.9
Occupation of women	Governmental employee	66	28.1
	Private employee	7	3
	Private business	40	17
	House wife	98	41.7
	Student	24	10.2
Educational of husband	Primary school (1-8 grade)	17	7.2
	Secondary school (9-12 grade)	46	19.6
	College/University	172	73.2

Occupation of husband	Governmental employee	167	71.1
	Private employee	16	6.8
	Private business	49	20.9
	Daily laborer	3	1.3

Economic and pregnancy related factors of pregnant women who come for the first ANC visit

Based on their income, more than three-fourths 185 (78.7%) of the respondents were getting net income per month of >2000 ETB, while only 12(5.1%) were getting 500-1000 ETB net income per month. About 173 (75.9%) of the respondents had no payment for transportation and 154 (65.54%) of the respondents were paying <20 ETB for transportation. Concerning their number of pregnancy, about 98 (41.7%) of the respondents had once, while 32 (13.6%) of the respondents had four and more times. About 204 (86.8%) of the respondents had no history of abortion. Based on their number of parity, 106 (45.1%) of the respondents had none, and 8 (3.4%) of the respondent had 4 and more times. The majority, 23 (98.3%) of the respondents had the history of stillbirth (Table 2).

Table 2: Economic and pregnancy related factors of pregnant women who come for the first ANC visit in three selected health centers from September 1 to 30, 2022.

Variables (n=235)	Category	Frequency	Percent (%)
Net income per month	500-1000 ETB	12	5.1
	1001-2000 ETB	38	16.2
	>2000 ETB	185	78.7
Payment for transportation	Yes	55	24.1
	No	173	75.9
Amount of money paid for transportation	<20 ETB	154	65.54
	>20 ETB	81	34.46
Number of pregnancy	Once	98	41.7
	Twice	62	26.4
	For three times	43	18.3
	For 4 and more times	32	13.6
History of abortion	Yes	31	13.2
	No	204	86.8
Number of parity	Once	67	28.5
	Twice	35	14.9
	For three times	19	8.1
	For 4 and more times	8	3.4
	None	106	45.1
History of still birth	Yes	4	1.7
	No	231	98.3

The knowledge status of pregnant women towards ANC service

Among the respondents, all of them (100%) responded that ANC is important for them. The time perceived by the respondents to initiate the first ANC after amenorrhea was different. About 4 (1.7%) responded that it is better if the first ANC is initiated in the first month, 28 (11.9%) responded that it should be initiated in the second month, 105 (44.7%) responded that it should be initiated in the third month, 91 (38.7%) responded that it should be initiated in the fourth month, and the rest (7.0%) responded that it should be initiated in the fifth and above month. Only 3 (1.3%) of respondents believe that the frequency of ANC is two times, 30(12.8%) believe it is three times, the majority of

respondents (136, 57.9%) believe it is four times, and the rest (66, 28.1%) believe it is five or more times over the pregnancy. Regarding knowledge of danger signs, 121 (51.5%) respondents had no knowledge of danger signs that may occur during pregnancy, while the rest, 114 (48.5%) of the respondents, had knowledge. The majority of respondents mention vaginal bleeding and cessation of fetal movement as danger signs. From those who got ANC during a previous pregnancy, 30 (23.3%) respondents did not have knowledge of danger signs, while 99 (76.7%) had knowledge (Table 3).

Table 3: The knowledge status of the pregnant women towards the ANC service who come for the first ANC visit in three selected health centers from September 1 to 30, 2022.

Variable (n=235)	Category	Frequency	Percent (%)
Importance of ANC service for the mother	Yes	235	100
	No	0	0
The time perceived by the mother to initiate first ANC booking after amenorrhea	First month	4	1.7
	Second month	28	11.9
	Third month	105	44.7
	Four	91	38.7
	Five and above month	7	3
The time perceived by the mother for the women needs to go for ANC during pregnancy	Two times	3	1.3
	Three times	30	12.8
	Four times	136	57.9
	5 or more times	66	28.1
Knowledge on danger sign	Yes	137	58.3
	No	98	41.7
Mentioned danger signs by the mother	Vaginal bleeding	47	34.3
	Cessation of fetal movement	42	30.7
	Persistent headache	26	19
	Face and leg edema	17	12.4
	Blurred vision	5	3.6

Past history of ANC service utilization among pregnant women

During the previous pregnancy, 8 (5.8%) respondents did not utilize ANC services, while the rest (129, (94.2%)) did. From those who had a history of ANC utilization, 53 (41.1%) respondents initiated their first ANC visit within 16 weeks of gestation, while 75 (58.9%) respondents initiated their first ANC visit after 16 weeks of gestation. Even though the service is given free of charge, some respondents paid money for some services. Three respondents were paid money for ultrasound, which ranges from 100-200 ETB (Table 4).

Table 4: Past history of ANC service utilization of pregnant women who come for the first ANC visit in three selected health centers from September 1 to 30, 2022.

Variables (n=235)	Category	Frequency	Percentage (%)
Previous ANC utilization	Yes	129	94.2
	No	8	5.8
The time the mother start her first ANC visit	≤ 16 weeks	53	41.1
	>16 weeks	76	58.9
Payment during previous pregnancy	Yes	3	2.3
	No	126	97.7

The service paid during check up	Card	0	0
	Laboratory	0	0
	Ultrasound	3	100
	Drugs	0	0
	Other	0	0
Maximum birr asked for the service	<100 ETB	0	0
	100-200 ETB	3	100
	>200 ETB	0	0

History of current pregnancy

Among the total respondents, 131 (55.7%) knew their pregnancy by missed periods, 81 (34.5%) knew it by laboratory, 21 (8.9%) knew it by physiological and physical changes of the body, and the rest (2.9%) knew it by ultrasound. 62 (26.4%) respondents initiated their first ANC visit within 16 weeks of gestation, and the rest 173 (73.6%) respondents initiated their first ANC visit after 16 weeks of gestation during this pregnancy. From 235 respondents, 137 (58.3%) had information about antenatal care services, while 98 (41.7%) did not have any information.

Of the total respondents, 188 (80.0%) used family planning, and 47 (20.0%) did not use family planning before this

pregnancy. Injectable and implants were the most commonly used family planning methods, with 100 (53.2%) and 66 (35.1%), respectively. Regarding the plan of pregnancy, 202 (85.5%) of the respondent's pregnancy was planned, with all 202 (86.0%) of the husband's involvement in the pregnancy planning, and the rest, 33 (14.0%), was not planned, with only 28 (82.4%) of the husband's acceptance after the occurrence of an unplanned pregnancy. Regarding pregnancy plans, 202 (86%) respondent's pregnancies were planned with their husband's involvement, and the rest, 33 (14.0%), were not planned (Table 5).

Table 5: Current pregnancy history of pregnant women who attend ANC clinic for the first ANC visit in three selected health centers from September 1 to 30, 2022.

Variable	Category	Frequency	Percent (%)
Means to know pregnancy	Missed period	131	55.7
	Laboratory	81	34.5
	Physiological change	21	8.9
	Ultrasound	2	0.9
Gestational age of this pregnancy	Less or equal to 16 weeks	62	26.4
	>16 weeks	173	73.6
Information about ANC service	Yes	137	58.3
	No	98	41,7
History of family use	Yes	188	80
	No	47	20
Type of family planning used	Condom	2	1.1
	Pills	12	6.4
	Inject able	100	53.2
	Implant	66	35.1
	IUCD	3	1.6
	Natural	5	2.7
Planned pregnancy	Yes	202	86

	No	33	14
Involvement of husband on pregnancy planning	Yes	202	100
	No	0	0
Acceptance of unplanned pregnancy by the husband	Yes	29	87.9
	No	4	12.1

Current ANC service utilization of pregnant women

Among the study subjects, 198 (84.3%) of respondents came to the ANC clinic for a pregnancy checkup, and 37 (15.7%) of respondents came to take the TT vaccine. The majority, 218 (92.8%) of respondents, come to the clinic by themselves, while the rest (17.2%) are sent by another person (health extension workers). More than two-thirds (68.9%) of respondents came to the ANC clinic for their first ANC after 16 weeks of gestation. The reason for coming after 16 weeks of gestation for the first ANC visit was health professional's advice not to come to ANC early before four months. 84 (51.5%), absence of problems during pregnancy for 30 (18.4%) of respondents, acceptance that it is the right time to start ANC for 41 (25.2%) of respondents, work load in the office and business area for 15 (11.8%) of respondents, and 8 (4.9%) of respondents. The place where they will give birth was assessed. Out of a total of 235 respondents, 216 (91.9%) prefer health institutions, and 4 (1.7%) prefer to deliver their child at home. But 15 (6.4%) of the respondents had not decided where to give birth (Table 6 and Figure 1)

Table 6: Current ANC service utilization of pregnant women who come for the first ANC visit in three selected health centers September 1 to 30, 2022.

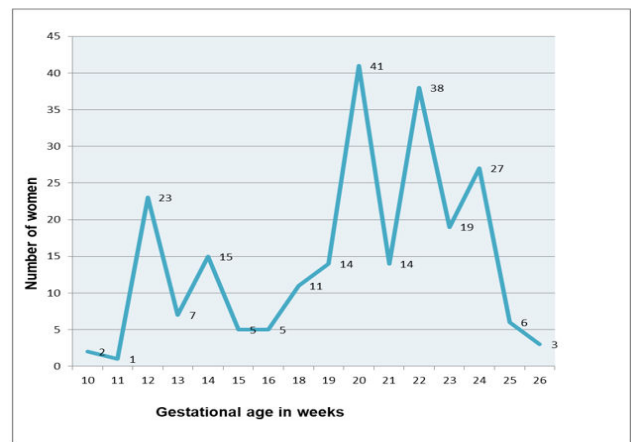| Variables	Category	Frequency	Percentage (%)
The reason given by the women to come to ANC clinic during this pregnancy	Check up	198	84.3
	To take TT vaccine only	37	15.7
Decision making power of the women	Yes	218	92.8
	No	17	7.2
The reason given by the mother for late initiation of ANC in current pregnancy	Health professionals advice not to come early before 4 month	119	50.6
	No health problem	45	19.15
	Right time to start	39	16.59
	Work load	32	13.66
Plan for delivery	At health institution	216	91.9
	At home	4	1.7
	I did not decide	15	6.4

Figure 1: Gestational age at first antenatal care initiation of pregnant mother who attend antenatal clinic in public health centers from September 1 to 30, 2022.

Factors associated with the late initiation of the first ANC visit

Bivariate logistic regression was conducted to identify candidate variables for the final model, considering a p-value <0.25. In our study, previous late first ANC initiation, having no information about ANC service, and unplanned pregnancy were identified as factors that have an association with the timing of current late first ANC initiation (Table 7).

Table 7: Bi-variable analysis of factors associated with late initiation of first antenatal care among pregnant women who attend ANC clinic late for the first ANC visit in public health centers from September 1 to 30, 2022.

Variables	Time of first ANC initiation, n=235		Crude OR (95% CI)	P-value
	≤ 16 weeks of gestation	>16 weeks of gestation		
Age of the women				
15-19	1 (11.1%)	8 (88.9%)	0.14 (0.02,1.38)	0.093
20-24	21 (28.4%)	53 (71.6%)	0.45 (0.15,1.31)	0.446
25-29	18 (20.2%)	71 (79.8%)	0.26 (0.96,0.84)	0.285
30-34	14 (30.4%)	32 (69.6%)	0.60 (0.19,1.86)	0.6
35-39	8 (47.1%)	9 (52.9%)	1	
Educational level				
Illiterate	1 (12.5%)	7 (87.5%)	0.32 (0.04,2.78)	0.303
Primary (1-8)	17 (26.2%)	48 (73.8%)	0.81 (0.38,1.68)	0.556
Secondary (9-12)	23 (26.4%)	64 (73.6%)	0.82 (0.41,1.61)	0.552
College/University	21 (28.0%)	54 (72.0%)	1	
Monthly income				
<500 ETB	0	0	0	
500-999 ETB	1 (8.3%)	11 (91.7%)	0.23 (0.03,1.79)	0.16
1000-2000 ETB	10 (26.3%)	28 (73.7%)	0.89 (0.41,1.96)	0.771
>2000 ETB	51 (27.6%)	134 (72.4%)	1	
History of abortion				
Yes	9 (29.0%)	22 (71.0%)	1	
No	53 (26.0%)	151 (74.0%)	1.11 (0.48,2.55)	0.809
History of still birth				
Yes	1 (25.0%)	3 (75.0%)	1	
No	61 (26.4%)	170 (73.6%)	0.89 (0.09,8.71)	0.919
Number of birth				
Once	16 (23.9%)	51 (76.1%)	1.02 (0.49,2.09)	0.964
Twice	13 (37.1%)	22 (62.9%)	1.92 (0.84,4.34)	0.12
Three times	5 (26.3%)	14 (73.7%)	1.89 (0.67,5.32)	0.228
Four and above	3 (37.5%)	5 (62.5%)	1.93 (0.43,8.73)	0.385
None	25 (23.6%)	81 (76.4%)	1	
Information about ANC service				
Yes	55 (40.1%)	82 (59.9%)	1	
No	7 (7.1%)	91 (92.9%)	9.26 (3.99, 21.47)	0.000*
Previous time of first ANC initiation				
≤ 16 weeks	32 (60.4%)	21 (39.6%)	1	
>16 weeks	5 (6.6%)	71 (93.4%)	15.02 (5.79,38.94)	0.000*

Pregnancy planned				
Yes	61 (30.2%)	141 (69.8%)	1	
No	1 (3.0%)	32 (97.0%)	4.33 (1.27,14.72)	0.019**
Decision by the mother to start ANC				
Yes	61 (28.0%)	157 (72.0%)	1	
No	1 (5.9%)	16 (94.1%)	1.82 (0.51,6.53)	0.363

Interpretation of the multivariable analysis result

In the current study, pregnant mothers who have no information about ANC visits were 9 times more likely to initiate ANC after the recommended time of first ANC compared to pregnant mothers who have information (AOR=0.06; 95% CI: 0.01, 0.58). Mothers who initiate their first ANC after 16 weeks of gestation in a previous pregnancy were 15 times more likely to initiate their first ANC in this pregnancy than mothers who initiate early in the previous pregnancy (AOR=0.04; 95% CI: 0.01, 0.11). Mothers whose pregnancy was unplanned were 4 times more likely to initiate first antenatal care late as compared to mothers whose pregnancy was planned (AOR=0.07; 95% CI: 0.01, 0.39) (Table 8).

Table 8: Factors associated with late initiation of ANC among pregnant women who come for the first ANC visit in three selected health centers from September 1 to 30, 2022.

Characteristics	Time of first ANC initiation, n=235		Crude OR (95% CI)	AOR (95% CI)
	<16 weeks of gestation	>16 weeks of gestation		
Information about ANC service				
Yes	55 (40.1%)	82 (59.9%)	1.00	1.00
No	7 (7.1%)	91 (92.9%)	9.26 (3.99, 21.47)	0.06 (0.01,0.58)*
Previous time of first ANC initiation				
<16 weeks	32 (60.4%)	21 (39.6%)	1.00	
>16 weeks	5 (6.6%)	71 (93.4%)	15.02(5.79, 38.94)	0.04 (0.02, 0.12)*
Pregnancy plan				
Yes	61 (30.2%)	141 (69.8%)	1.00	
No	1 (3.0%)	32 (97.0%)	4.33 (1.27, 14.72)	0.07 (0.02, 0.39)**

Discussion

Our study was conducted in health centers, considering it is the first place where the majority of pregnant women prefer to get maternal health services compared to hospitals and other private clinics. In our study, 235 pregnant women participated. The majority 173 (73.6%) of the participants initiate their first antenatal care after 16 weeks of gestation, while 62 (26.4%) of respondents initiate it before and at 16 weeks of gestation. The World Health Organization (WHO) recommends every pregnant woman start the first antenatal care visit before or at 16 weeks of gestation. Our study indicates that a considerable proportion of pregnant women initiate their first antenatal care visit after 16 weeks of gestation. The result of this study is greater than the results of studies done in Mekele (67.3%), Halaba (72.8%), and Dilla, Ethiopia (50.3%) and Tanzania (71%), respectively. However, our study result is less than the results of studies conducted in Wollega (81.5%), Ambo (86.8%), and Arbaminch, Ethiopia (82.6%), respectively [11-15]. This difference may be due to the differences in socio-demographic characteristics and economic and cultural factors among respondents. Mothers who are illiterate, have a monthly net income of less than 500-1000 Ethiopian birr, gave birth twice or more, and have no history of stillbirth or abortion are more likely to initiate their first antenatal care after the recommended period of gestation. The reasons given by the mother for their late first antenatal care initiation are health professionals' advice not to come early before 4 months to initiate first antenatal care, no health problems, the right time to start first antenatal care, and work load in the office (work place). Additionally, the majority of women who attended antenatal care clinics during their previous pregnancy did not have knowledge of danger signs, the timing of their first antenatal care, or the recommended frequency of antenatal care visits. This indicates the

negligence of health providers towards antenatal care service delivery. This is the first area to focus on to prevent these problems.

In this study, women's status of information about antenatal care services was significantly associated with timely initiation of antenatal care. Women who have no information about antenatal care services were more likely to initiate their first antenatal care visit late than those who had information. Our finding is similar to the results of study conducted in Halaba, Ethiopia [16]. The possible justification could be that a lack of information delivery for mothers who have come for antenatal care previously and the absence of information about antenatal care in different media.

This study revealed that there was a statistically significant association between previous late first antenatal care initiation and the timely initiation of first antenatal care. Women who initiated first antenatal care late during a previous pregnancy were 15 times more likely to initiate late in this pregnancy than women who initiated early during a previous pregnancy. A similar finding was identified in studies done in Ethiopia [17,18]. The possible reason might be due to the advice of health professionals for pregnant women not to come early to the antenatal care clinic to initiate first antenatal care before 4 months of pregnancy, a lack of information about the timing and visits of antenatal care, the negligence of the mother towards the service, and a lack of awareness of danger signs.

In the current study, unplanned pregnancy was significantly associated with the timely initiation of antenatal care services. Women with unplanned pregnancies were more likely to initiate antenatal care after the recommended time of pregnancy. This finding is supported by studies done in Ethiopia [19,20]. This is might be due to a lack of knowledge about the pregnancy plan and a reluctance to seek proper care for the health and development of the pregnancy.

Conclusion

This study assessed the timing of first antenatal care and the associated factors among pregnant women who come to antenatal clinics in public health centers. The study has reported a high prevalence of late-first antenatal care. In our study, 73.6% of respondents initiated first antenatal care after the recommended time, while the rest, 26.4%, initiated first antenatal care within the recommended time. The major identified factors that contributed to the late initiation of first antenatal care were lack of information about antenatal care, previous late initiation of first antenatal care, and unplanned pregnancy. The main reasons raised by the mother for the late initiation of first antenatal care were health professional`s advice not to come early before 4 month to the clinic for the first antenatal care, no health problems, and work load in the office (work area). Accordingly, it is important to provide continuous health education on importance of early antenatal care visits at health facility.

Limitation of the Study

For those mothers who did not remember their last normal menstrual period, it was challenging to estimate the gestational age of the pregnancy. Our study was conducted in health centers; private clinics and hospitals were not included in our study, so the results could not be generalized to general populations. Furthermore, it was difficult to establish cause-effect relationship between variable since it was a cross-sectional study.

Ethical Consideration

Ethical clearance was obtained from research review and ethics committee of Hawassa College of Health Sciences. Legal permission was obtained from the health centers. The respondents were informed about the purpose of the study and their right to withdraw at any time. Furthermore, written consent was obtained from each respondent. Informed assent was obtained from a parent or guardian for study participants younger than 18 years of age. Confidentiality was maintained throughout the study by excluding personal identifiers, such as names and addresses.

Conflict of Interests

The authors declare that they have no conflict of interests regarding the publication of the current manuscript.

Authors' Contribution

SK, ST, AA, BH, AF, and TB conceived and designed the protocol, contributed for data analysis, and wrote the paper. All authors read and approved the final manuscript. We all contributed equally to this work.

Data Availability

The original datasets generated and/or analyzed during the current study are available upon reasonable request from the corresponding author.

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