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Antenatal Care Service Utilization and Associated Factors in Fogera District, Northwest Ethiopia- a Community-based Cross-sectional Study

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Abstract: Background: Antenatal care (ANC) is the care that a pregnant woman receives while she is pregnant through a series of consultations with a trained health care provider. Adverse pregnancy outcomes can be minimized or avoided if antenatal care is received early in the pregnancy and continued through delivery. Despite it is a serious public health problem in Ethiopia, formation on the proportion and determinant factors of antenatal care service utilization is not well documented, particularly in the study area. This study aimed to identify determinant factors and the proportion of antenatal care service utilization in Fogera district, North West Ethiopia, 2019. Objectives: To assess antenatal care service utilization and its associated factors in the Fogera district, Northwest Ethiopia, 2019. Methods: Community- based cross-sectional study was conducted from December-01- to December-30- 2019 among mothers who gave live birth in the past one year before the study. Data were collected from 409 mothers using an interviewer-administered structured questionnaire. The data were analyzed manually and the chi-square test was used to describe relevant variables. Results: Antenatal care service utilization was 61.8% in the Fogera district. Variables such as age, Parity, Previous ANC visit, planned recent pregnancy, History of abortion were found to be associated with antenatal care service utilization with (df=2, x^2=17.035 and p<0.001), (df=2, x^2=10.50 and p<0.01), (df=1, x^2=39.7 and p<0.001), (df=1, x^2=31.91 and p<0.001) and (df=1, x^2=6.39 and p<0.02) respectively. Conclusion: In this study, the proportion of antenatal care service utilization among mothers who gave live birth in the past one year, in Fogera district was found to be 61.8% and age, parity, history of abortion, planned recent pregnancy, previous ANC visit was found to be significantly associated with antenatal care service utilization. Recommendation; Based on this research every pregnant mother should receive the recommended antenatal care visits as it is important in identifying risk factors for adverse pregnancy outcomes, both for the mother and newborn and in providing preventive and promotive health services.

Keywords: Antenatal Care, Factors, Community-based Study, Ethiopia

1. Introduction

Antenatal care is an important determinant of high maternal mortality rate and one of the basic components of maternal care on which the life of mothers and babies depend. [1].

Antenatal care (ANC) can be defined as the care provided by skilled health-care professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy. The components of ANC include risk identification; prevention and management of pregnancy-related or concurrent diseases; and health education and health promotion [2]. A significant number of women develop pain and bleeding in early pregnancy and require timely assessment and sensitive management in a specialist setting. Poor clinical outcomes are linked to inappropriate management It includes routine follow up provided to all pregnant women at primary care level from screening to intensive life support during pregnancy and up to delivery [3].

Antenatal care (ANC) is the care that a pregnant woman receives while she is pregnant through a series of consultations with a trained health care provider, i.e., midwives, nurses, and medical doctors [4]. Millennium Development Goal 5 (MDG5), calls for the improvement in maternal health, with a target of reducing the maternal mortality ratio (MMR) by three-quarters over the period 1990-2015. Ethiopia is a major contributor to maternal deaths in the world with a maternal mortality ratio of 673 per 100,000 live births and 19,000 maternal deaths annually. However, improvements have been reported about infant and child mortality reduction, there has been slow progress regarding achieving Millennium Development Goal 5 [5].

The quality of antenatal care (ANC) is dependent on the qualifications of health providers and the number and frequency of ANC visits. The content of services received and the kinds of information given to women during their ANC visits are also important components of quality care. These services raise awareness of the danger signs during the pregnancy, delivery, and postnatal period, improve the health-seeking behavior of women, orient them to birth preparedness issues, and provide basic preventive and therapeutic care [6].

Adverse pregnancy outcomes can be minimized or avoided altogether if antenatal care is received early in the pregnancy and continued through delivery (3). The World Health Organization (WHO) recommends that a woman without complications should have at least four antenatal visits, the first of which should take place during the first trimester [2]. one in every four (24 percent) women reported that they were informed of signs of pregnancy complications during their ANC visit (3).

Accordingly, the Federal Ministry of Health (FMOH) has applied a multi-pronged approach to reduce maternal and newborn morbidity and mortality by improving access to and strengthening facility-based maternal and newborn services [7].

In the year 2009/10, Ethiopia had launched a Community Based Health Care System, i.e., the Health Extension Program with the focus to improve the accessibility of family planning, safe abortions, ANC, skilled delivery and postpartum care in the community where Health Extension Workers are the Frontlines [8].

A trend analysis of the Ethiopian Demographic and Health Survey from 2000 to 2014 showed that there was a significant increase in the proportion of women who had at least one ANC from 27% in 2000 to 74% in 2019. The increase was significant during the period 2005 to 2019 [9]. The proportion of women informed of signs of pregnancy complications varies widely by region from a low of 17 percent in Amhara to 73 percent in Addis Ababa. The proportion of women informed of signs of pregnancy complications increases with education and household wealth [10].

A cross-sectional study was done in Tigray Region, Ethiopia showed that the utilization of antenatal care service was significantly associated with marital status, education, the proximity of health facility, and husband's occupation [11]. Another study was done in Dembecha district, Ethiopia also showed that maternal age, husband's attitude, family size, maternal education, and perceived morbidity were significantly associated with antenatal care service utilization [12].

There are no studies previously conducted on mothers' antenatal care service utilization and its associated factors among mothers who gave live birth in the past one year before study in Fogera district, Northwest Ethiopia. Therefore, this study aimed to identify determinant factors and the proportion of antenatal care service utilization in Fogera district, North West Ethiopia, 2019.

2. Methods and Materials

2.1. Study Design, Subjects, and Setting

Community- based cross-sectional study was conducted from December-01- to December-30- 2019 among mothers who gave live birth in the past one year before the study. The study was conducted in the Fogera district in the South Gondar zone of the Amhara region, Ethiopia. It is located 57 km to the north of Bahir Dar. The district had -32- cluster kebeles. Based on clusters' 2018/2019 annual plan; its total population was estimated to be 257,160; of this 130,712 are males and 126448 are females. The district has 9 health centers, 45 health posts, 13 private clinics, and 1 private drug store (13).

2.2. Sample Size and Sampling Procedure

The sample size was determined by using the formula for a single population proportion. The following assumptions were made; 95% level of confidence, 5% margin of error, and 41% of the proportion of antenatal care service utilization in Adet district (14), and 10% of sample size were added to compensate non-respondents.

$$N = \frac{z^2 \times p(1-p)}{w^2} \tag{1}$$

$$N = \frac{(1.96)^2 \times 0.41\,(1-0.41)}{(0.05)^2} = 372.$$

Adding 10% of non-response rate compensation the final sample size was 409.

The district had a total of 32 cluster kebeles and health posts. The first three kebeles were selected by using a simple random sampling technique. Then, a list of mothers who had children less than one year was identified, using the community health management information system (CHMIS) folder list in the health posts. The name, Kebele, and Gott of each mother having children less than one year were identified and registered with the collaboration of Keeble's health extension workers by using the CHMIS family folder list. Then a simple random sampling technique with a table of random numbers was used to select study participants. All sampled mothers who had children age less than one year and lives in the area for six months during the study period were

then interviewed at their home and three visits were done for those who were absent during the visits.

2.3. Data Collection Procedure

A pre-tested, structured, face-to-face interviewer-administered questionnaire was used for data collection. The questionnaire was prepared in the English language then translated to the Amharic language, and back to English by language experts to check for its consistency. Ten data collectors who had a diploma in nursing and two supervisors who had first-degree health officers were recruited to participate in data collection based on set criteria and trained for data collection and supervision. Data collectors directed questions for mothers at their homes.

2.4. Data Quality Assurance

To keep the quality of data, the questionnaires were pretested on 5% of the total sample size selected from one of the non-selected cluster Kebele (at Quahara Abo Kebele). The Supervisors checked the completeness of the questionnaire filled each day and he returned incomplete questionnaires to the data collector to refill by revisiting the next day.

2.5. Study Variables

2.5.1. Dependent Variables
Antenatal care service utilization.

2.5.2. Independent Variables
Socio-demographic characteristics such as (Age, Income, Place of residence, Occupation, Educational status, Religion, Ethnicity, etc.).

Reproductive history such as (Gravidity, parity, previous ANC visit, history of abortion, planned recent pregnancy).

2.6. Data Processing and Analysis

The data were analyzed manually; descriptive analysis was done with Frequencies, percentages by using tables and figures. Chi-square tests were used to identify relevant variables associated with antenatal care service utilization.

2.7. Ethical Consideration

Ethical clearance was obtained from the research and publication office of Rift Valley University. The committee reviewed the aforementioned project proposal with special emphasis on all ethical principles considered (respect for persons, beneficence, and justice), the objective of study ethically achievable, and method ethically sound. Then permission letter was obtained from zonal and district health offices. The questions from the questionnaire were proved not to affect the morale and personality of study participants. Informed verbal consent was obtained from each study subject after an explanation of why they take part in the research. They were also informed participation is volunteer-based. Confidentiality shall be ensured from all the data collectors, supervisors, and investigators side using code

numbers than names and keeping questionnaires locked. Each respondent was assured that the information provided by them were confidential and use only for research. Moreover, there would be no risk or harm that was anticipated from the participation of the study.

3. Result

3.1. Socio-demographic Characteristics of Respondents

In this study, 409 mothers who gave live births within the past one year were interviewed with a response rate of 100%. The mean age of the participants was 29 year with a standard deviation of 0.75 years. Most of the participants (79.2%) were within the age range of 20-34 years. Almost all of the participants (92.9%) were orthodox Religion followers and only (3%) and (4.1%) of responding mothers followed Protestant and Muslim religion respectively. Almost half (54.5%) of the mothers had no education and (56%) of respondents were housewives (Table 1).

Table 1. *Socio-demographic characteristics of mothers who gave live birth in the past one year before study in Fogera district, South Gondar, Amhara Region, Northwest Ethiopia.*

Variables	Category	Frequency	Percent
	<20	23	5.6
Age	20-34	324	79.2
	35-49	62	15.2
	Orthodox	380	92.9
Religion	Muslim	17	4.1
	Protestant	12	3
Ethnicity	Amhara	409	100
	No education	223	54.5
Maternal education	Primary education	165	40.4
	Secondary education	21	5.1
	Housewife	229	56
Maternal occupation	Government employee	23	5.6
	Merchant	43	10.4
	Farmer	114	28
Residence	Rural	409	100

3.2. Obstetric Characteristics of Respondents

Half of the respondents (49.9%) have had pregnancy between 1and 2 and 50.1% of respondents were Pregnant more than two times with the mean numbers of pregnancies 3 per woman and with a standard deviation of 0.1 pregnancies. (63.1%) of mothers was delivered 1-2 times. In this study (61.8%) of women utilized ANC service. The mean numbers of delivery were 2.6 per woman with a standard deviation of 0.1 deliveries (Table 2).

Table 2. *Obstetric history of mothers who gave live birth in the past one year before the study.*

Variables	Category	Frequency	Percent (%)
	1-2	201	49.1
Gravidity	3-5	185	45.2
	≥6	23	5.7
	1-2	258	63.1
Parity	3-5	138	33.7
	≥6	13	3.2

Variables	Category	Frequency	Percent (%)
History of abortion	Yes	49	12
	No	360	88
Planned recent pregnancy	Yes	313	76.5
	No	96	23.5
Previous ANC visit	Yes	239	58.5
	No	170	41.5
Current ANC visit	Yes	253	61.8
	No	156	38.2

Variables	Category	Frequency	Percent (%)
	None	156	38.2
	1	134	32.8
Number of Current ANC visit	2	119	29.1
	3	71	17.3
	4	67	16.4
	Total ANC	253	61.8

Figure 1. *The frequency and percent of Antenatal Care services received by mothers who gave live birth in the past year in Fogera district, South Gondar, Amhara Region, Northwest Ethiopia.*

3.3. Chi-square (x^2) Analysis of Factors Affecting Utilization of ANC service

Chi-square (x^2) Analysis of factors affecting utilization of antenatal care services in table 3 indicates; age, Parity, Previous ANC visit, planned recent pregnancy, History of abortion were found to be associated with antenatal care service utilization in mothers who gave live birth in the past one year in Fogera district with (df=2, x^2=17.035 and p<0.001), (df=2, x^2=10.50 and p<0.01), (df=1, x^2=39.7 and p<0.001), (df=1, x^2=31.91 and p<0.001) and (df=1, x^2=6.39

and p<0.02) respectively.

Based on the current study mothers in the age range of 20-34 years were utilized ANC service more significantly than any other age group. Mothers who deliver 3-5 times, mothers who faced abortion previously, mothers who have had previous ANC visits, and mothers who planned recent pregnancy were also utilized Antenatal care services more significantly than the other respective categories. Religion, maternal education, maternal occupation, and gravidity were found to be no association with ANC service utilization (table3).

Table 3. *Factors affecting utilization of antenatal care services in mothers who gave live birth in the past year before study in Fogera district, South Gondar, Amhara Region, Northwest Ethiopia.*

Variables	utilization of antenatal care services and its associated factors using x^2 test									
	Positive frequency		Negative frequency		Total observed frequency	Total expected frequency	df	X^2 tabulated	X^2 calculated	p-value
	observed	expected	observed	expected						
Age										
<20	5	14	18	9	23	23				
20-34	227	200	97	124	324	324	2	5.991	17.035	<0.001**
35-49	21	38	41	24	62	62				
Total	253	253	156	156	409	409				
Religion										
Orthodox	241	235	139	145	380	380				
Protestant	5	7	7	5	12	4	2	5.991	2.179	>0.2
Muslim	7	11	10	6	17	7				
Total	253	253	156	156	409	409				
Maternal education										

Variables	utilization of antenatal care services and its associated factors using x^2 test									
	Positive frequency		Negative frequency		Total observed frequency	Total expected frequency	df	X^2 tabulated	X^2 calculated	p-value
	observed	expected	observed	expected						
No education	123	138	100	85	223	223				
Primary education	114	102	51	63	165	165				
Secondary education	16	13	5	8	21	21	2	5.991	3.73	<0.1
Total	253	253	156	156	409	409				
Maternal occupation										
Housewife	131	142	98	88	229	229				
Government employee	20	14	3	9	23	23				
Merchant	32	27	11	16	43	43	3	7.815	4.349	>0.2
Farmer	70	70	44	43	114	114				
Total	253	253	156	156	409	409				
Gravidity										
1-2	126	125	75	76	201	201				
3-5	121	114	64	71	185	185	2	5.991	5.008	>0.1
≥6	6	14	17	9	23	23				
Total	253	253	156	156	409	409				
Parity										
1-2	141	160	117	98	258	258				
3-5	108	85	30	53	138	138	2	5.991	10.50	<0.01**
≥6	4	8	9	5	13	13				
Total	253	253	156	156	409	409				
History of abortion										
Yes	43	30	6	19	49	49				
No	210	223	150	137	360	360	1	3.841	6.39	<0.02*
Total	253	253	156	156	409	409				
Planned recent pregnancy										
Yes	232	194	81	119	313	313				
No	21	59	75	37	96	96	1	3.841	31.91	<0.001***
Total	253	253	156	156	409	409				
Previous ANC visit										
Yes	205	148	55	91	239	239				
No	48	105	101	65	170	170	1	3.841	39.7	<0.001***
Total	253	253	156	156	409	409				

Significant at *P value<0.05, **P value<0.01 and ***P-value<0.001.

4. Discussion

This study revealed that 61.8% of pregnant women were received at least one ANC service in the Fogera district. The finding was in line with a study conducted in a rural area of Bangladesh, Dodoma Municipal Tanzania, Ethiopian Mini Demographic and health survey 2014 in Amhara region, Womberima woreda, Dembecha district where 62.5%, 60%, 63%, 64.3%, 60% of mothers received ANC service respectively [12, 15-18]. The result of this study was similar to the above studies probably the population were rural population, the educational status of those studies were similar.

The finding of this study was lower than studies conducted in Semi-urban area in Fako Division, Cameroon, rural area of Nepal, Tigray region of Ethiopia, Oromia health bureau of Ethiopia, shashemene town of Ethiopia where 99%, 68%, 76%, 73%, 67.4% of mothers received ANC services respectively [6, 11, 19-21]. The probable reason may be due to variation in residence as our study was conducted on a rural population whereas those studies were conducted in the urban population, the quality of services given was different, accessibility of services was different.

The finding of this study was higher than studies conducted in urban squatter of Pakistan and Ethiopian

demographic and health survey 2011 in the Amhara region where 51% and 42% of mothers received ANC services respectively [10, 22]. The variation may be due to differences in the study period, the difference in population educational status, and the quality of service.

The study identified five variables as associated factors for pregnant mothers' antenatal care service utilization:

The first variable identified was the age of the mother and the current study shows mothers in the age range of 20-34 years were utilized ANC service more significantly than any other age group. The finding was following studies conducted in Womberima Woreda, were mothers whose age was 30-34 years and ≥35were 5.10 and 5.75 times more likely to utilize ANC services compared to mothers below the age of 30 respectively [18].

The current study shows that mothers who gave birth 3-5 times were more likely to utilize ANC service than those who had 1 or 2 and ≥6 births. The finding was almost the following studies conducted in Womberima Woreda, where mothers who had more than two were 5.18 times more likely to utilize ANC services than those who had two or one births [18].

The current study shows mothers who had a history of abortion were more likely to utilize ANC service compared to those who had no history of abortion. This was also the

following studies conducted in Womberima Woreda, were rural mothers with a history of abortion were 6.01 times more likely to utilize ANC service compared to mothers with no history of abortion [18].

Mothers who have had previous ANC visits and mothers who planned recent pregnancy were also utilized antenatal care services more likely than the other respective categories. This finding was also in line with studies conducted in Womberima Woreda, were rural mothers with 3.72 and 1.92 times more likely to utilize ANC services than their counterparts were [18].

5. Conclusion

In this study, the proportion of antenatal care service utilization among mothers who gave live birth in the past one year, in Fogera district was found to be 61.8% and age, parity, history of abortion, planned recent pregnancy, previous ANC visit was found to be significantly associated with antenatal care service utilization. Based on this research each pregnant mother should receive the recommended antenatal care visits, as it is important in identifying risk factors for adverse pregnancy outcomes, both for the mother and newborn and in providing preventive and promotive health services.

Consent for Publication

Not applicable.

Availability of Data and Material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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