



Magnitude and Associated Factors of Antenatal Care Utilization in Western Regions of Ethiopia: A study Based on Demographic and Health Survey Data

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Antenatal care (ANC) service is used to ensure the best health conditions for both mother and baby during pregnancy. There are marked disparities in the utilization of ANC utilization among regions of Ethiopia. Hence, this study was intended to analyze the magnitude and associated factors of ANC utilization in Western Regions of Ethiopia. The study was conducted based on 2019 Ethiopian Mini Demographic and Health Survey data. A total of 1200 women representing the three regions (Oromiya, Benishangul Gumuz and Gambela), who gave birth two years preceding the survey were included and the analysis was done by SPSS version 20. Multiple logistic regression was used to assess the net effect of associated factors of ANC utilization. Among the studied participants, 39.9%, 51.0% and 27.8% of women in Oromiya, Benishangul Gumuz and Gambela regions, respectively, received a minimum of four ANC visits from the skilled health personnel. The result from multiple logistic regression depicted that age in 5- year group, region, place of residence, maternal education and wealth index were significantly associated with the utilization of ANC service. The utilization of ANC service was higher among young women than old women while women in Benishangul Gumuz were more likely to receive ANC service than women in Gambela region. Better education attainment increases the likelihood of receiving ANC service from the skilled personnel. Urban women as well as rich women were more likely to receive ANC service

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than their respective rural and poor counterparts in the studied regions. Providing awareness creation on ANC utilization for women of fertile age is a best instrument to minimize maternal and child mortality.

Keywords: Reproductive health; Oromiya; Benishangul Gumuz; Gambela; Western Ethiopia.

1. INTRODUCTION

Maternal health is a global agenda which is one of the targets of Millennium Development Goals. One way of realizing the maternal and child health is through the sustainable provision of antenatal care service to pregnant women. Antenatal care (ANC) is the provision given by skilled healthcare professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy. The major components of ANC are risk identification, prevention and management of pregnancy related or concurrent disease, as well as health education and promotion [1]. The proportion of women utilizing ANC services reflects discrepancies in different parts of the world. Moreover, ANC application is suboptimal, particularly in the developing world [2].

Ethiopia is addressing major challenges in the health sector, including lack of human resources for health and low utilization of health services, through its innovative Health Extension Program, Accelerated Midwifery Training, Integrated Emergency Surgery and Obstetrics Task Shifting, and scaling up family planning. The Health Extension Program trains health extension workers to deliver a basic package of preventive and a few curative health services, including maternal and child health services [3]. Despite the major strides to improve the health of the population in the last one and a half decades, Ethiopia's population still faces a high rate of morbidity and mortality. Maternal mortality ratios are declining over a period of time, but the health status remains relatively poor. There are variations in using proper ANC between rural and urban as well as among regions. However, rural women were less likely than urban women to receive ANC from skilled provider.

World Health Organization (WHO) recommended a minimum of four ANC visits [4]; however, only around 50 percent of women in developing countries received adequate ANC [5]. The 2016 EDHS results show that 62 percent of women who gave birth in the five years preceding the survey received antenatal care from a skilled provider at least once for their last birth. Urban

women were more likely than rural women to have received ANC from a skilled provider (90 percent and 58 percent, respectively) and to have had four or more ANC visits (63 percent and 27 percent, respectively). Three in 10 women (32 percent) had four or more ANC visits for their most recent live birth [6]. The above figures showed that the utilization of the recommended ANC service in Ethiopia is still by far below an acceptable standard and hence, the problem still remains a challenge in Ethiopia. Perpetual findings of extensive research conducted in Ethiopia [7-12] indicate that diverse factors are associated with ANC utilization, with marked variations across the regions. According to EDHS (2016) report, only 22.1 percent of women in Oromiya region had four or more ANC visits while 42.0 and 43.4 percent of women in Benishangul Gumuz and Gambela regions, respectively, had four or more ANC visits.

In Ethiopia, though the improvement in maternal healthcare service utilization including antenatal care could be observed that, most of the women did not attend a minimum number of visits recommended by the WHO. While adequate care during pregnancy and delivery is essential, healthcare service utilization is extremely low. This low figure needs improvement through a routine research to device best health policy regarding maternal health. One procedure to realize this improvement could be looking at the factors of the variation in ANC utilization across the regions. Therefore, this study was sought to investigate the magnitude and determinants of ANC utilization in the three bordering regions (Oromiya, Benishangul Gumuz and Gambela) of Western Ethiopia. The present study would help policymakers to improve their knowledge regarding factors associated with the utilization of ANC service and subsequently can develop relevant policies for higher utilization of antenatal care services in the country.

2. METHODS

2.1 The Study Design and Data

The 2019 Ethiopian Mini Demographic and Health Survey (EMDHS) were used to analyze magnitude and factors associated with ANC

utilization in Western regions of Ethiopia. This data is the second EMDHS and the fifth DHS implemented in Ethiopia. The Ethiopian Public Health Institute conducted the survey in collaboration with the Central Statistical Agency and the Federal Ministry of Health, with technical assistance from ICF and financial as well as technical support from development partners. The 2019 EMDHS generates data for measuring the progress of the health sector goals set under the Growth and Transformation Plan, which is closely aligned to the Sustainable Development Goals. The survey was conducted from March 21, 2019, to June 28, 2019, based on a nationally representative Detailed information was collected for respondents' background characteristics, fertility determinants, marriage, awareness and use of family planning methods, child feeding practices, nutritional status of children and childhood mortality [13].

2.2 Outcome Variable and Method of Analysis

The outcome variable considered in this analysis was a binary indicator (utilization of ANC service) from skilled health personnel. This outcome variable was coded as 1 for the woman that utilizes ANC at least once, and 0 otherwise. Here, skilled personnel include doctors, nurses or midwives, health officers, and health extension workers.

2.3 Explanatory Variables

It is customary that predictor variables are selected based on their theoretical applicability and contextual literature review. So, the selected predictor variables included in the analysis were age in 5-year group, region, place of residence, marital status, sex of household head, maternal education status and wealth index.

2.4 Statistical Analysis

The data were analyzed by using the statistical software package for social sciences (SPSS) version 20. Descriptive statistics were used to describe characteristics of the studied participants. Binary Logistic regression model was used to identify factors associated with the utilization of ANC services during pregnancy in Western regions of Ethiopia. Bivariate logistic regression was carried out between the selected factors and the outcome variable. Those factors

which were significant ($P < 0.25$) in the bivariate logistic regression were selected and retained in the multiple logistic regression model. Multiple logistic regression analysis was conducted to assess the net effect of these factors on the utilization of ANC service during pregnancy. Adjusted odds ratio (AOR) with its respective 95% confidence interval is reported to show the strength of association.

3. RESULTS AND DISCUSSION

3.1 Characteristics of the Respondents

This study has been conducted on 1200 women of fertile age in Western regions of Ethiopia. Among all studied participants, around 70% of them were in the age group 20-34. More than 40% of them were from Oromiya region while the rest comprised Benishangul Gumuz and Gambela regions. Majority of the women (83.9%) were resided in rural areas and 83.6% of them were male headed households. Out of the sampled women, 43.6% of them had no formal education while 41.6% of them were attended up to primary school. However, small proportion of them (9.9% and 4.9%) attended secondary and higher educations, respectively. More than half (50.8%) of the surveyed women were in the poor wealth category (Table 1).

3.2 Magnitude of ANC Utilization

Table 2 presents number of ANC visits among the surveyed women across their respective regions. Accordingly, half of the women (51.0%) in Benishangul Gumuz received the recommended number (4 or more) of ANC visits. Although Oromiya region is among the developed regions in Ethiopia, one third of the women (29.5%) in this region had not received ANC visit at all. On the other hand, only 39.9% and 27.8% of the studied participants in Oromiya and Gambela regions, respectively, received the recommended number of ANC visits from the skilled personnel (Table 2).

3.3 Associated factors of ANC Utilization

The study used binary logistic regression to explore associated factors of ANC utilization. Univariate logistic regression was implemented to decide which variables would be retained in the multiple logistic model. Before using the model for prediction, it is normal to check the adequacy and goodness-of-fit of the model. Accordingly, omnibus test shows significance (P

= 0.000) implying that the data adequately fit to the model. Insignificance ($P = 0.716$) of the Hosmer and Lemeshow test suggested that the model is well fitted, meaning that the model prediction does not significantly differ from the observed. Of the candidate explanatory variables, marital status and sex of household head revealed insignificance in univariate model. Hence, they are dropped from the analysis of the multiple logistic regression.

Age in 5-year group, region, place of residence, education status and wealth index were found to be significant factors of ANC utilization (Table 3). Age in 5-year group is one of the significant factors of ANC utilization in the studied area. The finding further revealed that women aged 25-29 were 3.2 times more likely to receive ANC services from the skilled personnel [AOR = 3.242, 95% CI = 1.426, 7.370] than women aged 45-49. Similarly, women aged 30-34 were 2.7 times more likely to receive ANC service [AOR = 2.748, 95% CI = 1.192, 6.336] than those aged 45-49. These results indicated that young women

were more likely to receive the utilization of ANC service than old women.

Region is also among the strong significant variables associated with ANC utilization and the result of adjusted odds ratio revealed that women of fertile age in Benishangul Gumuz region were 1.9 times more likely to receive ANC service [AOR = 1.889, 95% CI = 1.249, 2.858] than women in Gambela region. A study by [14] reported that region is strong determinant of recommended ANC utilization in Ethiopia. This result is also consistent with the report of EDHS 2016. Place of residence is a crucial significant factor influencing the utilization of ANC service in Western regions of Ethiopia. Controlling for other variables in the model, urban women were 1.4 times more likely to receive ANC service from the skilled health personnel [AOR = 1.367, 95% CI = 0.421, 1.015] than their rural counter parts. This might be due to the disparities in the health facilities and the awareness of women on ANC services in urban and rural areas. Similar findings were documented in previous studies [9, 14] in Ethiopia.

Table 1. Percentage of ANC utilization by socioeconomic and demographic variables

Variables	Categories	Received ANC from skilled personnel	
		Yes %	No %
Age in 5 year group	15-19	74.0	26.0
	20-24	82.6	17.4
	25-29	80.6	19.4
	30-34	74.4	25.6
	35-39	68.8	31.2
	40-44	67.5	32.5
	45-49	48.3	51.7
Region	Oromiya	70.5	29.5
	Benishangul Gumuz	80.9	19.1
	Gambela	79.3	20.7
Place of residence	Urban	89.6	10.4
	Rural	73.6	26.4
Sex of household head	Male	75.0	25.0
	Female	82.2	17.8
Education Status	No education	65.8	34.2
	Primary	81.4	18.6
	Secondary	90.8	9.2
	Higher	94.9	5.1
Wealth index	Poor	66.9	33.1
	Medium	79.3	20.7
	Rich	90.3	9.7

Source: Author's computation

Table 2. Distribution of ANC utilization by number of visit across Western regions of Ethiopia

Western Regions	Number of ANC Visits			
	No ANC	1 ANC	2-3 ANC	≥ 4 ANC
	%	%	%	%
Oromiya	29.5	2.7	27.9	39.9
Benishangul Gumuz	19.1	2.7	27.2	51.0
Gambela	20.7	2.1	49.4	27.8

Source: Author's computation

Table 3. Multiple logistic output of associated factors of ANC utilization

Variables	Categories	Coeff.	P-value	AOR	95% C.I for AOR	
					Lower	Upper
			0.030			
Age in 5-year group	15-19	0.646	0.168	1.908	0.761	4.784
	20-24	1.074	0.014	2.927	1.238	6.923
	25-29	1.176	0.005	3.242	1.426	7.370
	30-34	1.011	0.018	2.748	1.192	6.336
	35-39	0.856	0.047	2.354	1.010	5.483
	40-44	0.743	0.109	2.103	0.847	5.223
	45-49 (Ref.)					
Region	Oromiya	-0.125	0.512	0.883	0.608	1.281
	Benishangul Gumuz	0.636	0.003	1.889	1.249	2.858
	Gambela (Ref.)					
Place of residence	Urban	0.313	0.026	1.367	0.790	2.367
	Rural (Ref.)					
Education status	No education	-1.318	0.038	0.268	0.077	0.928
	Primary	-0.691	0.270	0.501	0.147	1.711
	Secondary	-0.029	0.967	0.972	0.253	3.735
	Higher (Ref.)					
Wealth index	Poor	-1.272	0.000	0.280	0.182	0.432
	Medium	-0.716	0.005	0.489	0.295	0.810
	Rich (Ref.)					
Constant		2.221	0.004	9.218		

AOR = Adjusted odds ratio, CI = Confidence interval, N = 1200, Significance levels: 1% and 5%

Source: Author's computation

Education status is significantly associated with the utilization of ANC service and the result confirmed that women with no education were 0.3 times less likely to use ANC service from skilled personnel [AOR = 0.268, 95% CI = 0.077, 0.928] than women with higher education. Education is an important instrument that modifies women's beliefs about disease causation and cure. This helps to improve both child care practices and the use of modern health care service. Similar finding was observed in the study conducted in Southwestern Ethiopia [15]. This finding is also consistent with previous studies conducted in Pakistan [16] and in Ghana [17]. Better educational attainment of the women increases awareness of the need to

access health services by frequent antenatal care visits.

Wealth index is also one of the strong significant factors of ANC utilization. Accordingly, the result of adjusted odds ration depicted that poor women were 0.3 times less likely to receive ANC service [AOR = 0.280, 95% CI = 0.182, 0.432] than the rich women while women with middle wealth category were 0.5 times less likely to receive ANC service from the skilled personnel [AOR = 0.489, 95% CI = 0.295, 0.810] than rich women. Women with medium and rich household wealth index were more likely to be able to pay for care-seeking costs. This result is consistent with the result by [9] who discussed that women

from low wealth index households had more number of ANC visits than women from middle wealth index in Ethiopia. Similar results have been documented in the previous studies in Uganda [18] and in Nepal [19].

4. CONCLUSION

Based on the EMDHS data and an appropriate modeling approach, the study allows assessing the magnitude and factors associated with the utilization of ANC service in Western regions of Ethiopia. The descriptive result indicates the under-utilization of ANC service in Western regions of Ethiopia, compared to the global utilization to meet Sustainable Development Goals. The model result shows that young women are more likely to receive the utilization of ANC service, while women in Benishangul Gumuz region are more likely to receive ANC service than women in Gambela region. Urban women are also more likely to receive ANC service from the skilled personnel than rural women. The result further depicts that women with no education are less likely to receive ANC service, compared to women with higher education. Women with poor and medium wealth categories are less likely to receive ANC service from the skilled personnel than rich women. Hence, interventions should be in place to improve women's education and their wealth status. Providing awareness creation on ANC utilization is another instrument to minimize maternal and child mortality.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVALS

we conducted our research after obtaining proper IEC approval.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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