Prevalence and Factors Associated with Late Antenatal Care Visit in Ethiopia: A population-based study using the 2016 Ethiopia Demographic and Health Survey

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Research note

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Abstract

Objectives Maternal health care services are important for the survival and wellbeing of both mother and infant. In 2015, an estimated 303,000 women died from pregnancy-related complications. The Ethiopian government has implemented strategies to enhance maternal health service utilization, and reduce maternal morbidity and mortality. However, only 20.4% of women initiated the first antenatal care visit before 16 weeks of gestation. Therefore, this study assessed factors associated with late antenatal care visit in Ethiopia. A community based cross-sectional study design was used to examine 4,740 women from the 2016 Ethiopia Demographic and Health Survey data. Odds ratios with corresponding 95% confidence intervals (CI) were computed to examine the strength of an association. In the multivariable analysis, variables with p-value <0.05 were considered as statistically significant. Result The prevalence of late initiation of first antenatal care visit in Ethiopia was 67.3% (65.0%,69.6%). Living in rural areas (AOR= 95% CI:1.19,2.56) and fifth or above birth order (AOR=1.5;95% CI:1.10,2.00) were significantly associated with late antenatal care visit. Consequently, increasing the access and utilization of family planning, and raise an awareness on the benefit of early initiation of first antenatal care visit is recommended.

Introduction

Pregnancy is a happy period for the woman, husband, family, and community when it is wanted or intended (1). Maternal health care services are important for the survival and wellbeing of both the mother and the infant and reduce the morbidity and mortality rate during pregnancy, childbirth, and the postpartum period (2). Antenatal care (ANC) is a complex of interventions that a pregnant woman receives from organized health care services, and provides a platform for important health care functions, including health promotion, screening and diagnosis, and disease prevention. The first ANC visit should occur in the first trimester, around or preferably before 16 weeks of gestational age (3). In developing countries, complication during pregnancy and childbirth are the leading cause of death and disabilities among women of the reproductive age group (4, 5). In 2015, an estimated 303 000 women died from pregnancy-related causes, 2.7 million babies died during the first 28 days of life and 2.6 million babies were stillbirth (6). Almost all of the maternal (99%) and child (98%) deaths occur in low and middle-income countries. Of which, two-thirds (66%) were occurred in sub-Saharan Africa (7, 8). The Ethiopia Demographic and Health Survey (EDHS) 2016 reported that maternal mortality ratio (MMR) is estimated to be 412 deaths per 100,000 live births which is high among rural women (2).

Evidence showed that not attending or delayed initiation of ANC increase the risk of poor birth outcomes, maternal and neonatal death (9). Most maternal complications which occurs during pregnancy and childbirth are preventable or treatable. Crucially, ANC provides the opportunity to communicate with and support women, families, and communities at a critical time in the course of a woman's life (10).

In Ethiopia, the proportion of reproductive age women who received ANC from skilled provider has increased from 34% in 2011 to 62% in 2016, and 37% of women in Ethiopia had no ANC visits (2). Early

entry to antenatal care is important for early detection and treatment of adverse pregnancy related outcomes (11). Even though the ANC coverage of Ethiopia is 62%, only 20.4% of women start ANC visit before 16 weeks of gestation (1). Despite the fact that ANC utilization is essential for further improvement of maternal and child health, little is known about the factors affecting the use of antenatal care service timely in Ethiopia. Therefore, the aimed to assess the prevalence and determinants of late initiation of ANC visit in Ethiopia.

Methods

Data source, sampling and data collection

Data for the study was extracted from the Ethiopia EDHS 2016, is the fourth and most recent in the Demographic and Health Survey series in Ethiopia. The survey was conducted in nine regional states and two city administrations of Ethiopia. A detailed description of National Health and the Nutrition Examination Survey (NHANES) study design and methods are available in EDHS, 2016 (2).

A total of 15,683 women aged 15-49 years were interviewed in the 2016 EDHS, of which 7,590 women had at least one live birth in the last 5 years prior to the survey. Women who had no ANC follow up (n=2,818) were excluded. The remain, 4,772 women were checked for the timing of first ANC visit for the most recent pregnancy and women who were responded 'don't know' their first ANC visit were excluded(n=32). The final analytic sample for the study included 4,740 women.

Outcome variable

Late antenatal care visit: the initiation of first antenatal care visit in health facility which has skilled health professional after 16 weeks of gestation for the most recent pregnancy.

Independent variables

The covariates included sociodemographic and economic factors (residence, marital status, mother's age, mother's education, husband's education, mother's currently working status, exposure to media and household wealth quantile), obstetrics factors (history of pregnancy termination, pregnancy wantedness and birth order) and facility related factors (distance from nearby health facility).

Statistical analysis

Data were analyzed using SPSS version 20 statistical software (12). Sampling weight was applied for all analysis procedure to account for complex survey design and unequal probabilities of selection. Rao-Scott chi-square test was used to examine the bivariate associations between each covariate and institutional delivery. Descriptive statistics were employed to show the distribution of background

characteristics. Both bivariate and multivariable logistic regression analysis were performed to identify factors associated with late initiation of antenatal care. Odds Ratios with their corresponding 95% confidence intervals (CI) was calculated to see the presence and the strength of associations. Variables in the bivariate logistic regression with a p-value less than 0.2 were fitted into the multivariable logistic regression to control the possible effects of confounders. Multicollinearity was checked using a variance inflation factor (VIF). Using a conservative threshold VIF value of 4, no collinearity was detected. In the multivariable analysis, variables with a p-value <0.05 were considered as statistically significant.

Result

Sociodemographic and economic characteristics

A total of 4,730 women who had antenatal care follow up for the most recent pregnancy in the 5 years prior to the survey were included in the analysis. The mean (standard error) age of women was 26.74 (0.15) years. Most (81.6%) of mothers were lived in rural area. Approximately, 93.4 and 72.1% of women were currently married, and between the age of 20 to 34 years, respectively. More than half of mothers were illiterate and 68.1% were not currently working. Nearly (75%) of mothers were not exposed to media (read a newspaper, listened to the radio, or watched television, at least once a week). Furthermore, 22.7% of mothers were found in the richest household wealth quantile (Table 1).

Table 1: Sociodemographic characteristics of participants in Ethiopia (n=4,740)

Health facility and obstetrics related characteristics

Half of the women perceived the distance to a nearby health facility as a big problem for utilization of maternal health services. The majority (76%) of pregnancies were planned, and 90.8% of women had not a history of abortion, miscarriage, and stillbirth. About 23% of the most recent child was the first birth. For 36.6% of women, the most recent birth was the fifth or more birth order. Regarding the antenatal care, 32.7% women were initiated first antenatal care before 16 weeks of gestation (Table 2).

Table 2: Health facility and obstetric related characteristics of participants in Ethiopia (n=4,740)

The prevalence of Late ANC visit

The prevalence of late initiation of antenatal care (ANC) visit in Ethiopia was found to be 67.3% (95% CI: 65.0%, 69.6%).

Factors associated with Late ANC visit

Both bivariable and multivariable logistic regression analyses were done to see the association between the selected variables with late antenatal care visit in Ethiopia. As it's presented in Table 3: numerous

socio-demographic, economic, facility and obstetrics related characteristics were considered in the bivariable analysis. In the bivariable analysis, residence, marital status, mother's education, wealth status, exposure to media, distance from a nearby health facility and birth order showed that a p-value less than 0.02 and fitted in the multivariable analysis. The result of the multivariable analysis showed that residence and birth order were significantly and independently associated with late ANC visit.

The odds of late ANC visit were 1.7 times (AOR=1.7; 95% CI:1.19,2.56) higher among women who lived in the rural areas compared to women who lived in the urban areas. Compared to the first order of birth, fifth or above order of birth were 1.5 times (AOR=1.5;95% CI:1.10,2.00) more likely to late initiation of ANC visit (Table 3).

Table 3: Bivariable and multivariable analyses for late antenatal care visit of participants in Ethiopia (n=4,740)

Discussion

The prevalence of late antenatal care follows up for the most recent pregnancy in Ethiopia was found to be 67.3% (65.0%,69. 6%). This finding was lower than those of other studies in Kenya 86% (13), Malawi 70% (14) and Uganda 79% (15).The possible difference might be the variation of time trends in which the government of the countries, and World Health Organization (WHO) increase the accessibility of health facilities with time to prevent maternal and child morbidity and mortality. However, this prevalence is higher than others studies in Rwanda, 60% (16) and Systematic and Meta-analysis in Ethiopia, 64% (17). The possible discrepancy with Rwanda might be due to the variation in socioeconomic and cultural difference. Furthermore, the Rwanda Demographic and Health Survey (RDHS) considered late antenatal care among women who gave birth in the last 5 years prior to the survey as a denominator. The possible discrepancy with systematic and meta-analysis in Ethiopia might be due to the variation in selecting study setting, in which almost all studies were conducted in urban areas only. While EDHS also conducted in rural area which more educated women are concentrated, and more accessible to health facilities. Commonly, women who lived in rural areas are less educated, work overloaded, and affected by cultural taboos.

As compared to women who lived in urban areas, women who lived in rural areas were found at increased odds of having late antenatal care visit. This finding was supported by studies from Malawi (14), and Systematic and Meta-analysis in Ethiopia (17). Women living in rural areas are less expose to social medias help to raise an awareness on the benefit and timing of ANC visit initiation. Women who are living in rural areas are work loaded and have poor decision-making power to receive ANC follow up timely. In addition, maternal health services are less accessible near to their home which needs to travel a long distance and costly transportation.

In addition, higher order of birth was one of the predictors for late antenatal care visit. This study was supported by those of other studies in Kenya (13), United States (18), and High-income countries (19). The possible reason might be women with high birth order or high parity does not feel their pregnancy

early which prone to delay the time of first antenatal care visit. Similarly, high parity women might difficult to arrange childcare for other children in their home resulting difficult to seek antenatal care service. Moreover, higher order of birth is more likely to be unwanted and unplanned pregnancy which affect the timing of first antenatal care visit (20-22) and missing familial or partner to support that engenders good healthcare seeking behavior.

Conclusion

The prevalence of late antenatal care visit was high in Ethiopia which is the major public health problem. Residence and order of births were significantly associated with late ANC visit. Therefore, creating awareness and providing family planning service to reduce unintended pregnancy, and large family size. Raising awareness on the importance of early initiation of first antenatal care visit and increasing the accessibility of maternal health service used to book first antenatal care early.

Strength and limitations

One of the strengths of the study is the use of large national probability sample. As a cross-sectional study, causal relation between independent variables with late antenatal care visit cannot be assessed. Additionally, this finding is may prone to recall and socially desirability bias because of data was collected based on self-reporting of participants.

Abbreviation

ANC: Antenatal Care; AOR: Adjusted Odds Ratio; CI: Confidence Interval; DHS: Demographic and Health Survey; EDHS: Ethiopia Demographic and Health Survey; NHANES: National Health and the Nutrition Examination Survey; VIF: Variance Inflation Factor; WHO: World Health Organization

Declarations

Ethics approval and consent to participate

The publicity available data set was obtained from the DHS website (<https://dhsprogram.com/>) through registering with the DHS website and as such, no ethical approval was not required.

Consent for publication

Not applicable.

Availability of data and materials

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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Authors' contributions

EAK, AAD and LBZ, were designed and drafted the research question. EA performed the research analysis with assistance from ADD and LBZ. All authors prepared the initial draft of the manuscript and critically revised the manuscript. All authors approved the final version of the manuscript.

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Tables

Table 1: Sociodemographic characteristics of participants in Ethiopia (n=4,740)

Variable	Number	Percentage
Residence		
Urban	874	18.4
Rural	3,866	81.6
Marital status		
Currently unmarried	291	6.1
Currently married	4,449	93.9
Mother's age		
≤19 years	744	15.7
20-34 years	3,415	72.1
≥35 years	580	12.2
Mather's education		
No education	2,555	53.9
Primary school	1,571	33.2
Secondary and higher school	814	12.9
Mother's currently working		
No	3236	68.3
Yes	1,504	31.7
Husband's education		
No education	1,774	39.9
Primary school	1,805	40.6
Secondary and higher school	846	19.0
Don't know	25	0.6
Exposed to media		
Not exposed	3541	74.7
Exposed	1,199	25.3
Wealth status		
Poorest	787	16.6
Poorer	931	19.6
Medium	984	20.7
Rich	963	20.3
Richest	1,075	22.7

Table 2: Health facility and obstetric related characteristics of participants in Ethiopia (n=4,740)

Variables	Number	Percentage
Distance from a nearby health facility		
No big problem	2,358	49.7
Big problem	2,382	50.3
Planned pregnancy		
Yes	3,604	76.0
No	1,136	24.0
Ever had a termination of pregnancy		
No	4,305	90.8
Yes	435	9.2
Birth order		
One	1,111	23.4
2-4	2,083	44.0
5+	1,545	32.6
Time of first ANC visit		
Before 16 weeks	1,550	32.7
16 or above weeks	3,190	67.3

Table 3: Bivariable and multivariable analyses for late antenatal care visit of participants in Ethiopia (n=4,740)

Variable	Late ANC visit		COR (95% CI)	p-value	AOR (95% CI)
	Yes Number (%)	No Number (%)			
Residence					
Rural	447(9.4)	427(9.0)	2.3(1.80,3.02)	0.000	1.7(1.19,2.56)*
Urban	2,743(57.9)	1,123(23.7)	1.0		1.0
Marital status					
Currently unmarried	172(3.6)	118(2.5)	0.7(0.46,1.03)	0.072	0.8(0.50,1.19)
Currently married	3,018(63.7)	1,431(30.2)	1.0		1.0
Mother's age					
≤19	744	15.7	1.0		1.0
20-34	3,415	72.1	0.96(0.73,1.27)	0.761	
≥35	580	12.2	1.1(0.74,1.51)	0.772	
Mother's education					
No education	1,818(38.4)	737(15.5)	2.1(1.60,2.84)	0.000	1.2(0.86,1.70)
Primary	1,043(22.0)	529(11.2)	1.7(1.26,2.30)	0.001	1.2(0.83,1.61)
Secondary or higher	330(7.0)	284(6.0)	1.0		1.0
Mother's currently working					
No	2,198(46.4)	1,038(21.9)	1.1(0.90,1.33)	0.382	
Yes	993(20.9)	512(10.8)	1.0		1.0
Wealth status					
Poorest	552(11.6)	235(5.0)	1.9(1.44,2.56)	0.000	1.2(0.76,1.80)
Poorer	676(14.3)	255(5.4)	2.2(1.58,2.98)	0.000	1.3(0.85,2.02)
Medium	688(14.50)	295(6.2)	1.9(1.44,2.53)	0.000	1.1(0.77,1.72)
Rich	683(14.4)	280(5.9)	2.0(1.49,2.67)	0.000	1.3(0.85,1.87)
Richest	591(12.5)	484(10.2)	1.0		1.0
Exposed to media					
Not exposed	2,458(51.9)	1,083(22.9)	1.45(1.18,1.77)	0.000	0.9(0.69,1.13)
Exposed	732(15.4)	466(9.8)	1.0		1.0
Distance from nearby health facility					
Big problem	1,684(35.5)	698(14.7)	1.4(1.12,1.66)	0.002	1.1(0.86,1.34)
No big problem	1,506(31.8)	852(18.0)	1.0		1.0
Planned pregnancy					
No	780(16.5)	356(7.5)	1.1(0.84,1.40)	0.521	
Yes					

es	2,410(50.8)	1,194(25.2)	1.0		1.0
ever had termination of pregnancy					
es	301(6.4)	134(2.80)	1.0(0.83,1.47)	0.503	
lo	2,889(60.9)	1,416(29.9)	1.0		1.0
Birth order					
one	680(14.4)	431(9.4)	1.0		1.0
-4	1,354(28.6)	729(15.4)	1.2(0.94,1.47)	0.149	1.1(0.85,1.35)
+	1,156(24.4)	389(8.2)	1.9(1.43,2.48)	0.000	1.5(1.10,2.00) *

***p-value less than 0.05**