

Research Article

Utilization and Determinants of Antenatal Care Visits in East African Countries: A Multicountry Analysis of Demographic and Health Surveys

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Background. The health care a woman receives during pregnancy is important for her survival and baby, both at the time of delivery and shortly after that. In the context of high maternal morbidity and mortality in sub-Saharan Africa, fewer than 80% of pregnant women receive antenatal care visit services. Receiving antenatal care visits at least four times increases the likelihood of receiving effective maternal health interventions through the antenatal period. This study aimed to identify the utilization and determinants of attending at least four visits in 12 East African countries. **Methods.** The study used the demographic and health survey data from 12 East African countries from 2008 to 2018. The DHS program adopts standardized methods involving uniform questionnaires, manuals, and field procedures to gather information comparable across countries globally. A multivariable logistic regression model was fitted to identify the determinants of completing at least four antenatal care services. With their 95% CI obtained from the adjusted multilevel logistic regression model, the adjusted odds ratio was presented to show the magnitude of the relationship between the independent variable and completing antenatal care visits. **Results.** The pooled utilization of attending at least four antenatal care visit in the East African region was 52.44% (95% CI: 52.13, 52.74), with the highest attending at least four or more antenatal care visit visits in Zimbabwe (75.72%) and the lowest attending at least four or more antenatal care visit visits in Ethiopia (31.82%). The significant determinants of completing at least four ANC visits were age category (24–34 (AOR = 1.24, 95% CI: 1.18, 1.31) and 35–49 (AOR = 1.42, 95% CI: 1.32, 1.53)); being married women (AOR = 1.11, 95% CI: 1.105, 1.16); education levels of primary education (AOR = 1.20, 95% CI: 1.13, 1.27), secondary education (AOR = 1.24, 95% CI: 1.24, 1.47), and higher education (AOR = 1.91, 95% CI: 1.62, 2.14); birth order (2–4 (AOR = 0.75, 95% CI: 0.70, 0.79) and 5+ (AOR = 0.63, 95% CI: 0.58, 0.68)); planned pregnancy (AOR = 0.81, 95% CI: 0.75, 0.86); contraceptive utilization (AOR = 1.36, 95% CI: 1.29, 1.43); wealth status of middle (AOR = 1.11, 95% CI: 1.05, 1.17) and rich (AOR = 1.25, 95% CI: 1.18, 1.32); having no problem accessing health care (AOR = 1.095, 95% CI: 0.89, 0.97); and living countries. **Conclusions.** The coverage of completing the recommended antenatal care visit was low in the region. Age, marital status, mother's and partner's education, women's occupation, birth order, planned pregnancy, contraceptive utilization, wealth status, healthcare accessibility, and living countries were the major determinants of completing recommended antenatal care visits. Therefore, intersectoral collaboration to promote female education and empowerment, improve geographical access to health care, and strengthen implementation of antenatal care policies with active community participation is recommended. In addition, creating a conducive environment in entrepreneurial activities for poor women is needed.

1. Introduction

Antenatal care (ANC) coverage is an indicator of access to and use of health care during pregnancy. The antenatal period grants opportunities for pregnant women with interventions that may also be necessary for their infants' well-being and infants. ANC frequently provides the first contact opportunity for a female to connect with services, thus imparting an entry factor for built-in care, merchandising healthful domestic practices, influencing care-seeking behaviors, and linking women with pregnancy complications to a referral system. Receiving antenatal care at least four times increases the likelihood of receiving effective maternal health interventions through the antenatal period [1, 2].

In 2017, approximately 295,000 maternal deaths occurred worldwide, and every day 810 women died from preventable motives associated with being pregnant and childbirth. The majority of these deaths (94%) happened in low-resource settings, and most may want to have been prevented. In the same year, sub-Saharan Africa alone accounted for roughly two-thirds (196,000) of maternal deaths, while Southern Asia accounted for almost one-fifth (58,000) [3].

According to the Fragile States Index of 2017, 15 countries have been viewed to be at an excessive risk of maternal death (South Sudan, Somalia, Central African Republic, Yemen, Syria, Sudan, the Democratic Republic of the Congo, Chad, Afghanistan, Iraq, Haiti, Guinea, Zimbabwe, Nigeria, and Ethiopia). These 15 countries had MMRs in 2017, ranging from 31 (Syria) to 1150 (South Sudan) [4].

A recent multination randomized control trial governed by the WHO, and a scientific review showed that essential interventions would be provided over four visits at specified intervals, a minimum for healthy mothers with no underlying medical problems. This review has prompted the WHO to define the new approach of ANC-supported four goal-oriented visits. The recommended number of ANC visits for limited-resource settings depends not only on effectiveness but also on costs and barriers to ANC access [1, 5, 6]. The risk of maternal mortality is the highest for adolescent women younger than years old. The risks during pregnancy and childbirth are more significant among adolescent females aged 15–19 than females aged 20–24 [7, 8].

Women may die as a result of complications during the pregnancy and perinatal period. Most of these problems improve throughout being pregnant, and most are preventable or treatable. Other issues can also exist before being pregnant but are worsened for pregnancy duration, especially if not managed as part of the woman's care [9]. Teenage girls who are pregnant will be less likely to use ANC compared with older pregnant women [10, 11].

There is a wide variance between industrialized (98%) and low-income (68%) countries in its coverage. Although ANC services' coverage increases in many African countries, coverage alone does not provide sufficient information on the service [12]. There is a substantial-quality gap in ANC

services in sub-Saharan Africa. While coverage of at least one ANC visit is relatively high at 71%, many women attending ANC do not receive the full range of evidence-based components during pregnancy. This quality gap demonstrates key missed opportunities within health systems [13, 14].

In many low-income countries, numerous obstacles exist in the provision of ANC services. Like other developing countries, an unsatisfactory proportion of women receive antenatal care from a trained health professional during their pregnancy time in East Africa [15, 16]. This is often related to an insufficient number of skilled healthcare providers, particularly in rural and remote areas. Socio-economic and cultural influences are among important barriers. Providing qualified ANC services is a major problem for the country's poor health system [17, 18].

However, the World Health Organization (WHO) issued a new approach in 2016 that recommends eight ANC (antenatal care) contacts; focused antenatal care is still in practice in many African countries [19]. The four ANC visits' minimum requirement is influenced by geographical, socioeconomic, religious, cultural, and demographic factors [20, 21]. Besides, the health system can also be affecting access to healthcare services for pregnant women. Identifying the region's significant determinants and building a strong and integrated health system are important for improving maternal health outcomes. Therefore, this study aimed to assess the utilization and determinants of attending antenatal care at least four visits in 12 East African countries.

2. Methods

2.1. Data Source, Tool, and Sampling Procedure. The data were obtained from the MEASURE DHS program after preparing the concept note about the project. The DHS program adopts standardized methods involving uniform questionnaires, manuals, and field procedures to gather information comparable across countries globally. DHSs are nationally representative household surveys that provide data from a wide range of monitoring and impact evaluation indicators in population, health, and nutrition with face-to-face interviews of women aged 15 to 49. The surveys employ a stratified, multistage, random sampling design. Information was obtained from eligible women aged 15 to 49 years in each country [22]. Detailed survey methodology and sampling methods used in gathering the data have been reported elsewhere [23]. The Demographic and Health Survey (DHS) data were pooled from the 12 East African countries from 2008 to 2017. The recent DHS of the country-specific data set was extracted during the specified period. The 12 East African countries in which data extracted include Burundi, Ethiopia, Kenya, Comoros, Madagascar, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe. Each country's DHS data year was varied from 2008 (Madagascar) to 2018 (Zambia). From the 12 East African countries, only one year of DHS data with a limited sample were recently taken for this study (Table 1).

TABLE 1: The DHS years of study and study participants attending at least four ANC visits in the 12 East African countries from 2008 to 2018.

Eastern region of Africa	DHS year	Study participants
Burundi	2010	8,940
Ethiopia	2016	7,590
Kenya	2014	14,438
Comoros	2012	1,891
Madagascar	2008/09	8,526
Malawi	2015/16	13,515
Mozambique	2011	7,726
Rwanda	2014/15	2962
Tanzania	2015/16	7,078
Uganda	2011	10,152
Zambia	2018	9,316
Zimbabwe	2013/14	4,987
Total sample size	100,224	—

2.2. Variables

2.2.1. Outcome Variable. The outcome variable for this study was whether a mother completed four or more antenatal care visits or not. The variable is generated using the WHO-recommended antenatal care service [24].

2.2.2. Independent Variables. Based on known facts and literature works [25–28], the independent variables included in this study were a country, residence, age group, marital status, educational status, literacy level, husband education, occupational status, accessing health care, pregnant wontedness, birth order, contraceptive utilization, and wealth index.

2.3. Operational Definition

2.3.1. Accessing Health Care. Most studies have isolated the travel time and transport cost when looking at access to health facilities. In the DHS data, women were asked whether a range of factors would be a big problem for them accessing health care. We generated a binary composite variable using each country's DHS standard questions. The following questions are included:

- (a) Getting permission to go for treatment (v467b = 1)
- (b) Getting money for treatment (v467c = 1)
- (c) Distance to the health facility (v467d = 1)
- (d) Not wanting to go alone (v467f = 1)
- (e) At least one problem accessing health care (one or more of the above)

The definition of a “serious” problem of accessing health care was defined as (e) At least one problem accessing health care (one or more of the above) [23].

2.3.2. Wealth Index. The wealth variable was generated from the wealth index for the households. In the data set, the index has five quintiles, such as the lowest quintile (poorest), 2nd quintile (poorer), 3rd quintile (middle), 4th

quintile (wealthier), and the 5th quintile (wealthiest). In this study for ease of analysis, this variable was categorized as follows: “poorest” and “poorer” were coded as (1) “poor,” the middle was coded as (2) “middle,” and “wealthier” and “wealthiest” were coded as (3) “rich.”

2.4. Statistical Analysis. All statistical analyses were conducted using Stata, version 14.0. Multilevel models were fitted using “svy” survey commands to adjust for the variables of clustering survey design (Country), sampling weights, and standard errors (SE). A pooled analysis was conducted to increase the sample size of completing four or more antenatal care service users in the 12 East African Countries from 2008 to 2018. A stepwise backward elimination process was performed at each stage, and determinants associated with completing four or more antenatal care service users were retained. In the univariable analysis of a p -value, ≤ 0.25 were declared as a candidate variable for multivariable analysis [29]. The adjusted odds ratio (AOR) and associated 95% confidence interval (Cis) obtained from the adjusted multilevel logistic regression model were used to declare that determinates associated with completing four or more antenatal care visit services in the East African countries.

3. Results

The WHO East Africa region has 20 member states. In history, only 14 countries had DHS data; for this study, 12 countries were included. In two of the 14 countries, their DHS was conducted outside of the study period (Figure 1).

3.1. Inclusion and Exclusion Criteria of Study Countries in East Africa. A total of 100,224 births born to women in East African countries were included in this study (Table 1). Of this, 52,331 (52.21%) completed the recommended at least four ANC visits in the 12 East African countries. The largest study participants, 13,515 (13.49%), were from Malawi, and the smallest study participants, 1,891 (1.89%), were from Comoros. The majority of 76,335 (76.16%) of respondents were rural residents. The study participants' median age group was 28 years with an interquartile range of 24 to 34 years, with almost half of them 46,197 (46.47%) under the age group of 25 to 34 (Table 2).

3.2. Pooled Prevalence Attending at Least Four or More ANC Visits. The pooled prevalence of hearing at least four ANC visits in East African countries was 52.44% (95% CI: 52.13, 52.74), with the highest attending at least four ANC visits in Zimbabwe (75.72%) and the lowest attending at least four ANC visits in Ethiopia (31.82%) (Figure 2).

3.3. Determinates of Recommended Antenatal Care Visits. The age group had a significant effect on the recommended antenatal care visit. The odds of completing at least four ANC visits among mothers of age group 24–34 and 35–49 were increased by 24% (AOR = 1.24; 95% CI: 1.18, 1.31) and

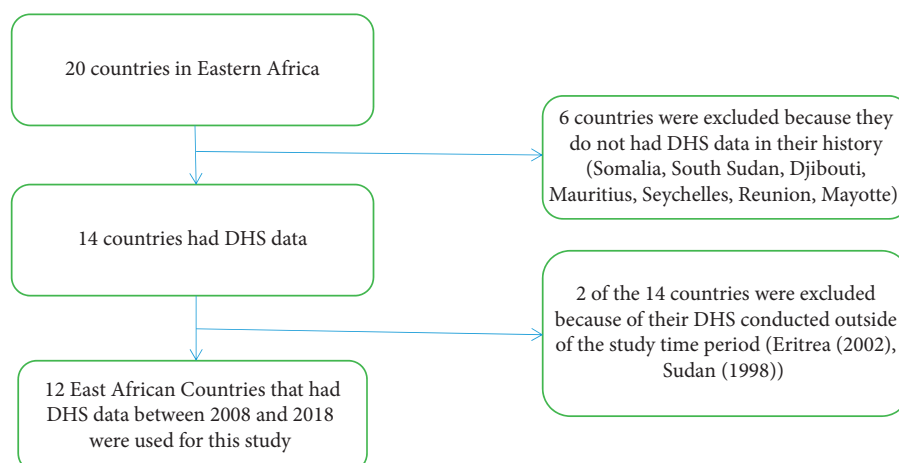


FIGURE 1: Schematic diagram of selection of study countries among East African countries.

TABLE 2: Individual- and country-level distribution of variables in 12 East African countries from 2008 to 2018.

Variables	Frequency (N = 100,224)	Percent
<i>Country</i>		
Burundi	8940	8.92
Ethiopia	7590	7.57
Kenya	14438	14.41
Comoros	1891	1.89
Madagascar	8526	8.51
Malawi	13515	13.49
Mozambique	7726	7.71
Rwanda	6059	6.05
Tanzania	7078	7.06
Uganda	10152	10.13
Zambia	9316	9.30
Zimbabwe	4987	4.98
<i>Residence</i>		
Urban	23889	23.84
Rural	76335	76.16
<i>Age group</i>		
15–24	30894	30.83
25–34	46,197	46.47
35–49	23,132	23.08
<i>Marital status</i>		
Single	30853	30.78
Married	69,370	69.22
<i>Educational status</i>		
No education	21871	21.83
Primary	53,271	53.16
Secondary	21,283	21.24
Higher	3787	3.78
<i>Husband education (N = 81,838)</i>		
No education	16604	20.29
Primary	40,065	48.96
Secondary	20520	25.07
Higher	4648	5.68
<i>Literacy level</i>		
Illiterate	35,309	35.25
Literate	64,846	64.75
<i>Maternal occupation (92,572)</i>		
Unemployed	25936	28.02
Employed	66636	77.98

TABLE 2: Continued.

Variables	Frequency (N = 100,224)	Percent
<i>Birth order</i>		
1	22,140	22.09
2–4	48,600	48.49
5+	29,482	29.42
<i>Pregnant wanted (N = 86,272)</i>		
Yes	78226	90.67
No	8046	9.33
<i>Contraceptive utilization (N = 92,661)</i>		
No	19,306	20.84
Yes	73,354	79.16
<i>Wealth index</i>		
Poor	42960	42.86
Middle	19503	19.46
Rich	37759	
<i>Accessing health care</i>		
Not serious problem	44387	44.22
Serious problem	55837	55.77

42% (AOR = 1.42; 95% CI: 1.32, 1.53) compared with teenage mothers. Marital status is associated with the recommended antenatal care visits.

The odds of completing at least four ANC visits among married mothers increased by 11% compared with a single (AOR = 1.11; 95% CI: 1.05, 1.16). The odds of completing at least four ANC visits among mothers who had primary, secondary, and higher education levels increased by 20% (AOR = 1.20; 95% CI: 1.13, 1.27), 35% (AOR = 1.35; 95% CI: 1.24, 1.47), and 91% (AOR = 1.91; 95% CI: 1.62, 2.14) as compared with mothers who had no education, respectively.

The odds of completing at least four ANC visits among mothers whose husbands had primary, secondary, and higher education levels increased by 9% (AOR = 1.09; 95% CI: 1.0, 1.15), 22% (AOR = 1.22; 95% CI: 1.14, 1.31), and 51% (AOR = 1.51; 95% CI: 1.35, 1.70) as compared with mothers whose husband had no education, respectively. The odds of having at least four visits among women who had occupation increased by 24% (AOR = 1.06; 95% CI: 1.01, 1.11).

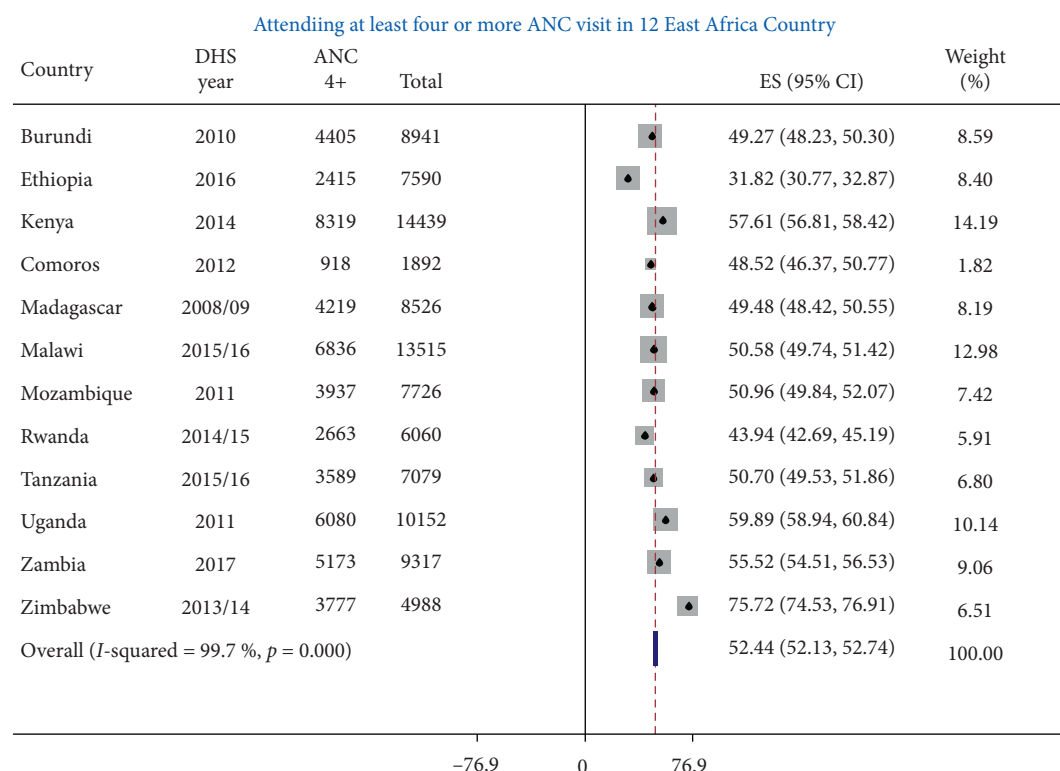


FIGURE 2: Effect size and overall effect size of the prevalence of attending at least four antenatal care visits in East African countries from 2008 to 2018.

compared with women who had no occupation. Birth order had a significant effect on ANC visits. The odds of completing at least four ANC visits among children being 2–4 and 5+ order decreased by 25% (AOR = 0.75; 95% CI: 0.70, 0.79) and 37% (AOR = 0.63; 95% CI: 0.58, 0.68) as compared with first-order, respectively.

The odds of completing at least four ANC visits among mothers who do not want pregnancy decreased by 19% (AOR = 0.81; 95% CI: 0.75, 0.86) compared with mothers who want pregnancy. The odds of completing at least four ANC visits among mothers who use contraceptives increased by 36% (AOR = 1.36; 95% CI: 1.29, 1.43) compared with mothers who do not use contraceptives. The odds of completing at least four ANC visits among women with middle and rich wealth categories increased by 11% (AOR = 1.11; 95% CI: 1.05, 1.17) and 25% (AOR = 1.25; 95% CI: 1.18, 1.32) compared with women with poor wealth status, respectively.

Accessing health problems had a significant role in ANC visits. The odds of completing at least four ANC visits among women who face serious healthcare problems decreased by 7% (AOR = 0.93; 95% CI: 0.89, 0.97) compared with its counterpart. The country residence has a significant role in completing at least four ANC visits in the East African countries. Zimbabwe was taken as a reference because it recorded better performance on completing four or more ANC visits than other countries (Table 3).

4. Discussion

The pooled prevalence of attending at least four or more ANC visits in East African countries was 52.44% (95% CI:

52.13, 52.74), with the highest attending at least four or more ANC visits in Zimbabwe (75.72%) and the lowest attending at least four or more ANC visits in Ethiopia (31.82%). This might be due to the difference in their healthcare system and policy implementation that may differ in their healthcare access and community awareness towards antenatal care services. Almost half of the region's women did not receive the minimum recommended four ANC visits, which is a conservative expectation compared with the recent recommendations of the World Health Organization (WHO), a minimum of eight visits. The proportion of women with four or more ANC visits is considerably lower than the global average of 61.8%. Implementing the recent WHO recommendation of a minimum of 8 ANC visits is the major challenge for the region [1].

The age group had a significant effect on the recommended antenatal care visit. The odds of completing four and above ANC visits among mothers of age group 24–34 and 35–49 were more likely to complete antenatal care visits than the young mothers. This finding is similar to that of studies conducted elsewhere [25, 30–32]. This may be clarified by the fact that earlier pregnancies have gained more experience and awareness about the benefits of visiting health facilities.

Marital status is associated with the recommended antenatal care visits. The odds of completing four or more antenatal care visits among married mothers increased by 11% compared with a single. This finding is also consistent with other studies [33, 34], as those married women have a probability of being supported by their husbands to

TABLE 3: The multivariable logistic regression of completed the recommended at least four antenatal care visits in the 12 East African countries from 2008 to 2018.

Variables	Crude odds ratio (95% CI)	<i>p</i> value	Adjusted odds ratio (95% CI)	<i>p</i> value
<i>Country</i>				
Burundi	0.31 (0.27, 0.35)	<0.001	0.47 (0.46, 0.55)	<0.001
Ethiopia	0.14 (0.12, 0.17)	<0.001	0.21 (0.18, 0.25)	<0.001
Kenya	0.43 (0.38, 0.48)	<0.001	0.49 (0.42, 0.56)	<0.001
Comoros	0.30 (0.25, 0.36)	<0.001	0.44 (0.36, 0.53)	<0.001
Madagascar	0.37 (0.27, 0.35)	<0.001	0.40 (0.35, 0.47)	<0.001
Malawi	0.32 (0.29, 0.35)	<0.001	0.39 (0.34, 0.45)	<0.001
Mozambique	0.33 (0.29, 0.38)	<0.001	0.50 (0.43, 0.58)	<0.001
Rwanda	0.25 (0.22, 0.28)	<0.001	0.31 (0.27, 0.36)	<0.001
Tanzania	0.32 (0.28, 0.37)	<0.001	0.33 (0.26, 0.42)	<0.001
Uganda	0.47 (0.42, 0.53)	<0.001	0.60 (0.52, 0.69)	<0.001
Zambia	0.39 (0.35, 0.45)	<0.001	0.46 (0.40, 0.53)	<0.001
Zimbabwe	1	—	1	—
<i>Residence</i>				
Urban	1	—	1	—
Rural	0.57 (0.54, 0.60)	<0.001	0.95 (0.89, 1.01)	0.144
<i>Age group</i>				
15–24	1	—	1	—
25–34	1.08 (1.04, 1.12)	<0.001	1.24 (1.18, 1.31)	<0.001
35–49	0.96 (0.92, 1.01)	<0.001	1.42 (1.32, 1.53)	<0.001
<i>Marital status</i>				
Single	1	—	1	—
Married	1.07 (1.03, 1.11)	<0.001	1.11 (1.05, 1.16)	<0.001
<i>Educational status</i>				
No education	1	—	1	—
Primary	1.60 (1.52, 1.68)	<0.001	1.20 (1.13, 1.27)	<0.001
Secondary	2.59 (2.44, 2.76)	<0.001	1.35 (1.24, 1.47)	<0.001
Higher	5.47 (1.84, 6.19)	<0.001	1.91 (1.62, 2.14)	<0.001
<i>Husband education</i>				
No education	1	—	1	—
Primary	1.42 (1.35, 1.52)	<0.001	1.09 (1.03, 1.15)	<0.001
Secondary	2.29 (2.15, 2.44)	<0.001	1.22 (1.14, 1.31)	<0.001
Higher	3.70 (3.33, 4.10)	<0.001	1.51 (1.35, 1.70)	<0.001
<i>Literacy level</i>				
Cannot read	1	—	1	—
Can read	1.69 (1.62, 1.72)	<0.001	1.03 (0.98, 1.08)	0.203
<i>Maternal occupation</i>				
Had no occupation	1	—	—	—
Had occupation	1.06 (1.01, 1.11)	<0.001	1.06 (1.01, 1.11)	<0.001
<i>Birth order</i>				
1	1	—	1	—
2–4	0.87 (0.83, 0.90)	<0.001	0.75 (0.70, 0.79)	<0.001
5+	0.65 (0.62, 0.68)	<0.001	0.63 (0.58, 0.68)	<0.001
<i>Pregnancy wanted</i>				
Yes	1	—	1	—
No	0.76 (0.72, 0.81)	<0.001	0.81 (0.75, 0.86)	<0.001
<i>Contraceptive utilization</i>				
No	1	—	1	—
Yes	1.59 (1.51, 1.66)	<0.001	1.36 (1.29, 1.43)	<0.001
<i>Wealth index</i>				
Poor	1	—	1	—
Middle	1.21 (1.15, 1.26)	<0.001	1.11 (1.05, 1.17)	<0.001
Rich	1.77 (1.70, 1.86)	<0.001	1.25 (1.18, 1.32)	<0.001
<i>Accessing health care</i>				
Not a serious problem	1	—	1	—
Serious problem	0.73 (0.70, 0.76)	<0.001	0.93 (0.89, 0.97)	<0.001

CI = confidence interval; ANC = antenatal care.

complete their ANC visits. Besides, women who do not have partners could experience financial difficulty that might prevent them from attending ANC regularly.

The study showed that both women's and their husbands' education influence antenatal care visits' completeness. This result is similar to the findings of other previous studies [25, 27, 31, 35]. This may be because education positively impacts healthcare service utilization and increment of knowledge about specific issues. Empowering women through education, household wealth, and decision-making increases the utilization of maternal healthcare service too.

Our findings suggest that women's occupation influences the completeness of antenatal care visits. These findings may be related to income and societal influences that come with employment outside the home, which has also been found in other previous studies [30, 36, 37].

The result also revealed that women who had planned to become pregnant were more likely to have attended ANC at least four times relative to those who did not plan to become pregnant at all. This suggests that women with unplanned pregnancies could have been unwilling to seek or attend ANC. Besides, the absence of a pregnancy' mindset, which is common in unexpected or unplanned pregnancy, could have negatively influenced women's use of ANC services [28, 38, 39].

Mothers who use modern family planning were more likely to complete four or more ANC visits than the others. This is because mothers who were using family planning might have more awareness and knowledge about the health providers' maternal health services. During counseling, women's knowledge about available family planning services and the medical facilities that provide such services could be increased [40].

The result of the current study revealed that women with medium and rich household wealth index were more likely to complete the minimum of 4 ANC services compared with women with poor household wealth index. This is because women with medium and rich household wealth index were more likely to pay for care-seeking costs such as transportation, medications, and any associated costs and can easily get information about the benefit of completing the ANC visits. This concept was consistent with studies [26, 41, 42].

The finding also revealed that accessing serious health problems had a significant role in antenatal care visits. Completing four or more ANC visits among women who face a serious problem of accessing health care was less likely than women who did not face accessing health care. This is because assessing healthcare services is important for promoting and maintaining their health and reducing unnecessary disability and premature death. Besides, accessibility is related to transport issues, financial burden, and long distance to the health facility [43].

Country residence has a significant role in completing four or more ANC visits in the East African countries. Zimbabwe was taken as a reference because it recorded better performance on completing four or more ANC visits than other countries. Ethiopia recorded the lowest,

completing four or more ANC visits, as compared with other countries. This is due to the difference in sociodemographic characteristics and different health systems. This difference might change the performance of completing four visits among pregnant women [44].

5. Strengths and Limitations of the Study

Findings from our study are supported by large data sets covering 12 countries in East African countries. The data were gathered following a common, internationally acceptable methodological procedure. Due to the survey's representative nature, the findings are representative of the included countries and generalizable to women who gave birth. Despite these strengths, the survey is cross-sectional, and hence causal inference cannot be made. A wide variation in the year of the DHS for the different countries, ranged from 2008 to 2018; this may result in selection bias.

6. Conclusion

The coverage of completing the fourth visit of ANC was low in the region. The women's age, marital status, mother's and partner's education status, women's occupation, birth order, planned pregnancy, modern contraceptive utilization, wealth status, healthcare accessibility, and living countries were the major determinants of completing the four antenatal care visits. Therefore, intersectoral collaboration to promote female education and empowerment, improve geographical access to health care, and strengthen implementation of antenatal care policies with active community participation is recommended. In addition, creating a conducive environment in entrepreneurial activities for poor women is needed.

Abbreviations

AHR: Adjusted hazard ratio
ANC: Antenatal care
CI: Confidence interval
CHR: Crude hazard ratio
EAs: Enumeration areas
DHS: Demographic and health survey
IUGR: Intrauterine growth restriction
MDG: Millennium development goal
SSA: Sub-Saharan Africa
WHO: World Health Organization.

Data Availability

Data are available online and can be accessed at <http://www.measuredhs.com>.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

ZTT and AM were responsible for the conception of the work, design of the work, data acquisition, analysis, and data interpretation. Data curation, drafting the article, revising it critically for intellectual content, validation, and final approval of the version published were performed by ZTT and AM. All authors read and approved the final manuscript.

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