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Correlates of late initiation and underutilisation of the recommended eight or more antenatal care visits among women of reproductive age: insights from the 2019 Ghana Malaria Indicator Survey

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ABSTRACT

Objective This study assessed the correlates of late initiation and underutilisation of the WHO's recommended eight or more antenatal care visits among women in Ghana.

Design We analysed secondary data from 2163 women in the 2019 Ghana Malaria Indicator Survey, which collected data on malaria and antenatal care indicators among women of reproductive age across the previous 10 regions of Ghana.

Setting and participants Women of reproductive age across the 10 regions of Ghana.

Main outcome measures Late initiation and underutilisation of the recommended eight or more antenatal care visits among women of reproductive age.

Results About half (49%) of the participants were between the ages of 25 and 34 years; mean (±SD)=30 (±7.10). The majority (57%) of the participants obtained less than eight antenatal care visits, while 32% initiated antenatal care visits after the first trimester. The significant factors associated with the late initiation of antenatal care visits were age, region and parity (p<0.05). Factors associated with underutilisation of the recommended eight or more antenatal care visits were marital status, wealth index, parity, region and place of residence (p<0.05).

Conclusion A majority of the women underused antenatal care services. A significant minority of the women started antenatal care visits late. Socio-demographic factors, parity and socioeconomic factors were identified as the significant factors associated with the late initiation and underutilisation of antenatal care services. Maternal health interventions should prioritise young, multiparous and poor women.

INTRODUCTION

Globally, the maternal mortality rate is still unacceptably high. In 2020, the global maternal mortality ratio was 152 deaths per 100 000 live births.[1] Even though most maternal deaths are preventable, a large percentage (94%) occur in low-resource settings.[2] Sub-Saharan Africa (SSA) alone accounts for two-thirds of the global maternal deaths.[2] West Africa has the highest number of maternal deaths, which is about 20% of all global maternal deaths.[3] Despite global efforts to improve access to maternal and child healthcare services, women in low-income and middle-income countries still experience a high risk of pregnancy-related deaths.[4 5] Utilisation of antenatal care (ANC) services is a major indicator for tracking progress towards achieving the Sustainable Development Goals (SDGs).[6] Target 3.1 of the SDGs aims to decrease maternal deaths to less than 70 per 100 000 live births by 2030.[7]

Early initiation and adequate utilisation of ANC services are crucial for reducing negative pregnancy outcomes, including maternal death and stillbirth.[8 9] Previously, the WHO recommended a minimum of four or more ANC visits, and the first visit should occur before the 16th week of gestation.[10] However,

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study used nationally representative data, hence making the findings generalisable to the population of women of reproductive age in Ghana.

⇒ Standard data collection procedures were used to ensure reliability; hence the survey estimates accurately represent the household situations.

⇒ The cross-sectional nature of the study makes it impractical to draw causal relationships.

⇒ We analysed secondary data which did not include some potential predictors of antenatal care (ANC) utilisation, including distance to health facilities, community factors and health-seeking behaviours.

⇒ ANC visits and time of initiation were self-reported, hence there were possibilities of social desirability and recall biases.

WHO in 2016 recommended eight or more ANC visits and the first visit should occur in the first trimester of pregnancy.[11] This new recommendation seeks to provide an opportunity for adequate maternal and fetal assessment which can help health professionals to detect complications early and provide timely interventions to reduce maternal and perinatal deaths.[12] Inadequate ANC utilisation breaks the critical link in the continuum of care and affects the health of the mother and baby.[13] Despite the ramifications of late initiation and underutilisation of ANC services, many women in SSA start ANC visits in the second or third trimester of pregnancy.[12]

Ghana adopted the previous WHO-focused antenatal care (FANC) model[14] which recommends four ANC visits. Yet, some women in Ghana are unable to attain this recommendation due to barriers such as financial constraints and poor road infrastructure.[15–17] Despite the institutionalisation of the FANC model in Ghana for over a decade, the maternal mortality ratio remains high (343 per 100 000 live births).[18] This raises concerns about the implementation of the latest recommendation of eight or more ANC visits during pregnancy.

Several studies[16 17 19 20] have assessed factors associated with the previous recommendation of four or more ANC visits among women in Ghana. Also, a recent study in Ghana assessed the prevalence and socioeconomic inequalities in the latest recommendation of eight or more ANC visits.[21] Prior studies elsewhere have shown that several factors are associated with late initiation and underutilisation of the recommended eight or more ANC visits. These factors include marital status, maternal age, parity, maternal education, husband's education, employment status, health insurance coverage and socioeconomic status.[5 12 22] Moreover, barriers such as long distances to health facilities, lack of transportation, financial constraints, lack of knowledge and misconceptions about ANC affect ANC utilisations.[5 12 22]

To the best of our knowledge, no study in Ghana has assessed factors associated with late initiation and underutilisation of the recommended eight or more ANC visits, using nationally representative data. To help improve maternal and reproductive health outcomes in Ghana and contribute to meeting the SDGs, there is a need for more contextual and recent evidence to inform maternal health policies and programmes. Therefore, this study aimed to assess factors associated with late initiation and underutilisation of the recommended eight or more ANC visits, using secondary data from the 2019 Ghana Malaria Indicator Survey.

METHODS
Data source and study design
Ghana is one of the countries in West Africa and shares boundaries with Togo to the east, Cote d'Ivoire to the west, Burkina Faso to the north and the Gulf of Guinea to the south. Ghana has a total population of about 30.8 million with the majority being women (50.7%).[23] In

Ghana, malaria is endemic and perennial. Ghana is one of the countries with the highest malaria burden. Malaria in pregnancy is a public health concern and accounts for 9% of all maternal deaths in Ghana.[24] We analysed data from the 2019 Ghana Malaria Indicator Survey (GMIS). The 2019 GMIS was the second of its kind, with the first survey conducted in 2016. GMIS is a national survey designed to collect information on malaria indicators (ie, ownership and use of mosquito bed nets, intermittent preventive treatment for pregnant women and malaria knowledge) to inform strategic planning and evaluation of malaria interventions in Ghana. Moreover, GMIS provides information on malaria prevention, treatment and prevalence in the country.

The 2019 GMIS was a nationwide survey that collected data across the previous 10 regions of Ghana, including rural and urban areas. Data collection was done in two phases, including the selection of 200 enumeration areas in the first phase and interviews in the second phase. During, the first phase, the households were listed, and information was collected on Global Positioning System coordinates and names of household heads. During the second phase, questionnaires were administered to eligible women aged 15–49 years.

Data collection started on 24 September 2019 and ended on 25 November 2019, by trained fieldworkers using questionnaires programmed into a Computer-Assisted Personal Interviewing application. The 2019 GMIS was conducted by the Ghana Statistical Service and Ministry of Health/Ghana Health Service with technical support from the Inner-City Fund through the Demographic and Health Survey programme.

Population and sampling
The target population for the GMIS was women between the ages of 15 and 49 years residing in Ghana at the time of the survey. The 2010 population and housing census sampling list was used as the sampling frame for the selection of households. The former 10 administrative regions of Ghana were divided into 20 strata, including rural and urban areas. The first stage comprised the selection of 200 enumeration areas (97 in urban areas and 103 in rural areas) using the proportional to size approach with independent selection in each stratum. The stratum was divided into enumeration areas or clusters.

The second stage of the recruitment included the selection of a fixed number of 30 households from each enumeration area. Replacement of non-responding households was not allowed. In all, 6000 households were selected, out of which 5833 were occupied. Of the total occupied households, 5246 women were eligible, out of which 5181 were interviewed, equivalent to a 99% response rate. The focus of this study was on women aged 15–49 who had a live birth in the last 5 years preceding the survey. Therefore, women who did not meet this criterion were dropped from the data set before the analysis. Also, non-response and 'do not know' responses were dropped from the data set. A total of 2939 participants out of the

5181 were dropped from the data set, the remaining 2242 participants (unweighted). After adjusting for the sample weight, clustering and stratification using the 'svy' Stata command, a weighted sample size of 2163 women was included in the analysis. Details about the 2019 GMIS can be found elsewhere.[25]

Measurement

The outcome variables were late initiation of ANC visits and underutilisation of the recommended eight or more ANC visits. All the outcome variables were originally coded as continuous variables. We recoded ANC initiation (*How many months pregnant were you when you first received antenatal care for this pregnancy?*) into a categorical variable: '0–3 months'=0: 'early initiation'; and '4–9 months'=1: 'late initiation'. We also recoded the number of ANC visits (*How many times did you receive antenatal care during this pregnancy?*) into a categorical variable: '1–7 ANC visits'=1: 'underutilisation' and '8–16 ANC visits'=0: 'optimum utilisation'. The independent variables included: age, educational status, religion, ethnicity, wealth index, region, type of place of residence, health insurance coverage and parity. The independent variables were selected from the literature. Also, we focused on independent variables that were available in the data set.

Statistical analysis

Data were analysed in three levels, including univariate, bivariate and multivariable. The sample weight was adjusted to offset challenges associated with oversampling, undersampling and survey weight. Descriptive statistics, including frequencies, percentages, mean and SD were computed and presented in a table. Chi-square (X^2) analysis was computed to check for associations between the independent and dependent variables. At the multivariable level, binomial logistic regression analysis was computed to identify the predictors of the outcome variables. Two regression models were computed. In model 1, the outcome was initiation of ANC visits. We simultaneously adjusted for the independent variables, including age, educational status, religion, ethnicity, wealth index, region, type of place of residence, health insurance coverage and parity. In model 2, the outcome was ANC utilisation and we simultaneously adjusted for the independent variables (same as model 1). The Hosmer-Lemeshow test showed that both models fitted well (p>0.05). All statistical significance and ORs were reported at the 95% CI and the 0.05 significance level. All statistical analyses were done with the aid of Stata/SE, V.16 (StataCorp, College Station, Texas, USA).

Patient and public involvement

The women or the public were not involved in the designing, conducting and reporting of this study.

RESULTS

Descriptive statistics for participant characteristics

About half (49%) of the participants were aged 25–34 years; mean (±SD)=30 (±7.10). More than half (53%) of the participants had attained secondary education, 76% of the participants were Christians and 56% resided in rural areas. A higher proportion of the participants were from the Ashanti region (17%), belonged to the Akan ethnic group (41%) and were in the poorest wealth quintile (21%). Most of the participants (59%) were covered by health insurance. Close to a quarter (24%) of the participants had given birth to one child, while 12% had given birth to six or more children. Regarding utilisation of ANC services, the majority (56%) of the women obtained less than eight ANC visits. Concerning initiation of ANC visits, almost one-third (32%) of the women started ANC visits after the first trimester of pregnancy (table 1).

Association between participant characteristics and adherence to the recommended ANC visits

The results showed that underutilisation of the recommended ANC visits was significantly associated with region, educational status, wealth index, religion, ethnicity, place of residence, age and parity (p value≤0.05). For instance, 76% (highest) of women in the Upper West region and 33% (lowest) of women in the Upper East region did not attain the recommended ANC visits. About 7 in 10 women with no education (66%) and those in the poorest wealth index (67%) did not attain the recommended ANC visits. In addition, initiation of ANC visits was significantly associated with educational status, wealth index and age (p value≤0.05). For example, 34% of women with no education and 18% of women with higher education started ANC visits after the first trimester of pregnancy. Also, 36% of women in the poorer wealth quintile started ANC visits after the first trimester of pregnancy. Similarly, 43% of women aged 15–24 years started ANC visits after the first trimester (table 2).

Predictors of underutilisation of ANC services

Women living in the other regions had higher odds of underusing the recommended ANC visits compared with those in the Upper East region. For example, women in Greater Accra (adjusted OR (AOR)=2.61, 95% CI: 1.32 to 5.18) and the Volta region (AOR=8.58 95% CI: 4.03 to 18.24) were over two and eight times more likely to underuse ANC services respectively compared with those in the Upper East region. In addition, compared with women aged 35–49 years, those aged 15–24 (AOR=2.67, 95% CI: 1.68 to 4.23) and 25–34 years (AOR=1.48, 95% CI: 1.09 to 2.01) had higher odds of underusing ANC services. Women who were in the poorest wealth quintile (AOR=2.22, 95% CI: 1.22 to 4.02) had higher odds of underusing ANC services compared with those in the richest wealth quintile. Women living in rural areas (AOR=1.44, 95% CI: 1.01 to 2.06) had higher odds of underusing ANC services compared with those in urban areas. We also found that women who had given birth to six or more children (AOR=2.74, 95% CI: 1.61 to 4.66) had higher odds of underusing ANC services compared with those who had given birth to one child (table 2).

Table 1 Descriptive statistics of participants' characteristics

Response	Frequency	Percentage
Region		
Western	226	10
Central	159	7
Greater Accra	322	15
Volta	219	10
Eastern	234	11
Ashanti	375	17
Brong-Ahafo	184	9
Northern	279	13
Upper East	97	5
Upper West	68	3
Educational level completed		
No education	447	20
Primary	448	21
Secondary	1137	53
Higher	131	6
Wealth index categories		
Poorest	446	21
Poorer	447	21
Middle	478	22
Richer	415	19
Richest	377	17
Religion		
Christian	1635	76
Islam	451	20
Others (ie, traditional)	77	4
Type of place of residence		
Urban	958	44
Rural	1205	56
Ethnicity		
Akan	892	41
Ewe	318	15
Mole-Dagbani	477	22
Others (ie, Grusi)	477	22
Age groups (years)		
15–24	494	23
25–34	1055	49
35–49	615	28
Health insurance coverage		
No	812	41
Yes	1151	59
Number of children ever born		
1	511	23
2	518	24
3	361	17
4	303	14
5	209	10
6 or more	261	12
ANC utilisation		
<8 ANC visits (underutilisation)	1222	56
≥8 ANC visits (optimum utilisation)	942	44
ANC initiation		
<4 months (early initiation)	1472	68
≥4 months (late initiation)	691	32

ANC, antenatal care.

Predictors of late initiation of ANC visits

The results demonstrated that women in the other regions had higher odds of starting ANC visits late compared with those in the Upper East region. For example, women in Greater Accra (AOR=3.08, 95% CI: 1.54 to 6.17) were three times more likely to start ANC visits late than those in the Upper East region. Also, women in the Western region (AOR=2.27, 95% CI: 1.15 to 4.48) were two times more likely to start ANC visits late compared with those in the Upper East region. In addition, women aged 15–24 years (AOR=3.51, 95% CI: 2.12 to 5.82) and those aged 25–34 years (AOR=1.78, 95% CI: 1.25 to 2.53) had higher odds of starting ANC visits late compared with women aged 35–49 years. It was also revealed that women who had given birth to six or more children had higher odds (AOR=2.74, 95% CI: 1.61 to 4.66) of starting ANC visits late compared with women who had given birth to one child (table 3).

DISCUSSION

This study assessed factors associated with late initiation and underutilisation of the recommended eight or more ANC visits among women in Ghana. This study found that 32% of the women started ANC visits late. This prevalence (32%) is lower than findings in the rural part of Ghana (43%)[19] and other SSA countries, including Ethiopia (71.2%),[12] (66.3%)[26] and (52.5%);[27] Zambia (86.6%);[28] and Tanzania (70.4%).[29] These divergent findings could be attributed to the socio-economic, cultural and timing differences among the study populations.[19 30 31] Late initiation of ANC visits could deny the mother of accessing the full benefits of preventive measures and early detection of disease (HIV/AIDS and other sexually transmitted infections). Moreover, mothers may miss essential services such as folate and iron supplements, which can help prevent neural tube defects.[32]

This study revealed that more than half (56%) of the women underused ANC services. Our finding contradicts prior studies in Africa. For instance, a recent study in Nigeria revealed that 83% of pregnant women were unable to attain the eight or more ANC visits[22] while in Benin 92% of women underused ANC services.[33] Also, studies outside the African continent found a high prevalence of underutilisation. For example, a study conducted in Bangladesh revealed that 94% of pregnant women did not attain the eight or more ANC visits.[34] Another study in Myanmar revealed that 82% of pregnant women underused ANC services.[5] Though the rate of underutilisation in this study was lower than what prior studies found, there is still the need to intensify maternal health interventions that would help increase ANC coverage.

The study also revealed geographical variations in ANC utilisation. Our findings showed that women in the Upper East region reported the highest ANC visits. Evidence shows that the Upper East region has the highest ANC and health insurance coverage in Ghana.[25 35] The differences in the findings may be attributed to the high health

Table 2 Factors associated with underutilisation and late initiation of antenatal care (ANC) visits

Participants' characteristics	ANC utilisation			ANC initiation		
	Optimum utilisation n (%)	Under utilisation n (%)	P value	Early initiation n (%)	Late initiation n (%)	P value
Region						
Western	141 (63)	85 (37)	<0.01	153 (68)	73 (32)	0.27
Central	51 (32)	109 (68)		113 (71)	46 (29)	
Greater Accra	190 (59)	132 (41)		214 (66)	108 (34)	
Volta	58 (27)	161 (73)		153 (70)	66 (30)	
Eastern	95 (41)	139 (59)		166 (71)	68 (29)	
Ashanti	175 (47)	200 (53)		251 (67)	124 (33)	
Brong-Ahafo	79 (43)	105 (57)		113 (61)	71 (39)	
Northern	71 (25)	208 (75)		184 (66)	95 (34)	
Upper East	65 (67)	32 (33)		76 (78)	21 (22)	
Upper West	16 (24)	51 (76)		49 (73)	18 (27)	
Educational level completed						
No education	150 (34)	297 (66)	<0.01	296 (66)	151 (34)	0.05
Primary	177 (39)	271 (61)		306 (68)	142 (32)	
Secondary	530 (47)	607 (53)		762 (67)	375 (33)	
Higher	85 (65)	48 (35)		108 (82)	24 (18)	
Wealth index categories						
Poorest	147 (33)	299 (67)	<0.01	302 (68)	144 (32)	0.02
Poorer	149 (33)	298 (67)		286 (64)	161 (36)	
Middle	203 (42)	275 (58)		322 (67)	156 (33)	
Richer	207 (50)	208 (50)		274 (66)	141 (34)	
Richest	236 (63)	141 (37)		287 (76)	89 (24)	
Religion						
Christian	754 (46)	881 (54)	<0.01	1121 (69)	513 (31)	0.71
Islam	164 (36)	287 (64)		299 (66)	153 (34)	
Others (ie, traditional)	24 (31)	54 (69)		52 (67)	25 (33)	
Type of place of residence						
Urban	457 (48)	501 (52)	0.03	653 (68)	306 (32)	0.98
Rural	484 (40)	720 (60)		820 (68)	385 (32)	
Ethnicity						
Akan	439 (49)	453 (51)	0.02	619 (69)	272 (31)	0.42
Ewe	131 (41)	187 (59)		226 (71)	92 (29)	
Mole-Dagbani	177 (37)	300 (63)		320 (67)	157 (33)	
Others (ie, Grusi)	195 (41)	283 (59)		308 (64)	170 (36)	
Age groups (years)						
15–24	168 (34)	326 (66)	<0.01	284 (57)	211 (43)	<0.01
25–34	480 (46)	574 (54)		732 (69)	323 (31)	
35–49	293 (48)	322 (52)		457 (74)	158 (26)	
Health insurance coverage						
No	358 (44)	454 (56)	0.80	546 (67)	266 (33)	0.44
Yes	519 (45)	633 (55)		799 (69)	352 (31)	
Number of children ever born						
1	226 (44)	284 (56)	0.05	339 (66)	172 (34)	0.48
2	249 (48)	269 (52)		359 (69)	159 (31)	
3	169 (47)	193 (53)		254 (70)	108 (30)	
4	115 (38)	188 (62)		200 (66)	104 (34)	
5	85 (40)	125 (60)		147 (70)	62 (30)	
6 or more	98 (38)	162 (62)		173 (66)	88 (34)	

insurance coverage in the region, which can help remove financial barriers to accessing ANC services. We also found that the Upper East region had the highest rate of early ANC initiation compared with the other regions. This might explain the low underutilisation of ANC services in the Upper East region.

Further, women of low socioeconomic status had higher odds of underutilisation compared with women of high socioeconomic status. This finding is consistent with a recent study in Nigeria[36] where women of high socioeconomic status were more likely to attain the recommended ANC visits. Another study in Myanmar revealed

Table 3 Predictors of underutilisation and late initiation of antenatal care (ANC) visits

Characteristic	Underutilisation		Late initiation	
	AOR (95% CI)	P value	AOR (95% CI)	P value
Region				
Upper East	1 (ref)	0.246	1 (ref)	0.018
Western	1.55 (0.73 to 3.27)	<0.001	2.27 (1.15 to 4.48)	0.094
Central	6.03 (2.88 to 12.59)	0.006	1.82 (0.90 to 3.67)	0.002
Greater Accra	2.61 (1.32 to 5.18)	<0.001	3.08 (1.54 to 6.17)	0.022
Volta	8.58 (4.03 to 18.24)	<0.001	2.19 (1.12 to −4.28)	0.048
Eastern	4.79 (2.36 to 9.71)	0.001	1.94 (1.00 to 3.75)	0.026
Ashanti	3.35 (1.61 to 6.98)	0.008	2.20 (1.09 to 4.42)	0.003
Brong-Ahafo	2.98 (1.33 to 6.69)	<0.001	2.81 (1.42 to 5.54)	0.050
Northern	6.03 (3.30 to 11.01)	<0.001	1.82 (0.99 to 3.32)	0.307
Upper West	6.54 (3.44 to 12.45)		1.34 (0.75 to −2.39)	
Educational level completed				
No education	1.50 (0.84 to 2.67)	0.167	1.35 (0.70 to 2.61)	0.361
Primary	1.25 (0.70 to 2.22)	0.433	1.04 (0.56 to 1.95)	0.887
Secondary	1.35 (0.82 to 2.23)	0.234	1.50 (0.75 to 3.00)	0.249
Higher	1 (ref)		1 (ref)	
Wealth index categories				
Poorest	2.22 (1.22 to 4.02)	0.009	1.51 (0.88 to 2.59)	0.130
Poorer	2.46 (1.47 to 4.11)	0.001	1.57 (1.01 to 2.43)	0.041
Middle	1.88 (1.25 to 2.83)	0.003	1.13 (0.83 to 2.09)	0.224
Richer	1.35 (0.86 to 2.14)	0.185	1.38 (0.95 to 2.01)	0.087
Richest	1 (ref)		1 (ref)	
Religion				
Christian	1.24 (0.84 to 1.84)	0.268	1.11 (0.50 to 2.45)	0.784
Islam	1 (ref)	0.404	1.12 (0.49 to 2.51)	0.782
Others (ie, traditional)	1.34 (0.66 to 2.72)		1 (ref)	
Type of place of residence				
Urban	1 (ref)	0.044	1.12 (0.86 to 1.46)	0.388
Rural	1.44 (1.01 to 2.06)		1 (ref)	
Ethnicity				
Akan	1.13 (0.72 to 1.77)	0.588	1.11 (0.69 to 1.80)	0.645
Ewe	1 (ref)	0.129	1 (ref)	0.302
Mole-Dagbani	1.14 (0.89 to 2.36)	0.393	1.44 (0.71 to 2.90)	0.496
Others (ie, Grusi)	1.21 (0.77 to 1.91)		1.28 (0.62 to 2.63)	
Age groups (years)				
15–24	2.67 (1.68 to 4.23)	<0.001	3.51 (2.12 to 5.82)	<0.001
25–34	1.48 (1.09 to 2.01)	0.011	1.78 (1.25 to 2.53)	0.001
35–49	1 (ref)		1 (ref)	
Health insurance coverage				
No	1 (ref)	0.99	1.07 (0.80 to 1.42)	0.638
Yes	1.00 (0.75 to 1.33)		1 (ref)	
Parity				
1	1 (ref)	0.958	1 (ref)	0.616
2	1.01 (0.71 to 1.41)	0.244	1.09 (0.77 to 1.54)	0.318
3	1.23 (0.86 to 1.77)	0.009	1.27 (0.78 to 2.07)	0.012
4	1.96 (1.18 to 3.24)	0.089	2.15 (1.18 to 3.90)	0.057
5	1.60 (0.92 to 2.76)	0.013	1.76 (0.98 to 3.16)	<0.001
6 or more	1.80 (1.13 to 2.87)		2.74 (1.61 to 4.66)	

that pregnant women in the highest wealth quintile were three times more likely to attain the recommended eight or more ANC visits compared with women in the lowest wealth quintile.[5] Our finding, however, contradicts a study in Ethiopia, where it was revealed that socioeconomic status did not influence the utilisation of ANC services.[37] A plausible explanation is that women of high socioeconomic status can afford maternal health services.

Despite, the Free Maternal Health Policy in Ghana, pregnant women still make unapproved payments during ANC visits.[38] In addition, women of high socioeconomic status can afford transportation costs and other charges which may pose barriers to accessing ANC services.

Women in rural areas were more likely to underuse ANC services compared with those in urban areas. This finding is consistent with studies conducted in low-income

and middle-income countries.[22 34] Evidence shows that there is a significant difference in rural–urban utilisation of maternal healthcare services including ANC, which may be due to inequities in the distribution of healthcare resources between rural and urban areas.[39–42] In addition, women in rural areas may face challenges such as long distances to health facilities and poor road infrastructure.[39] In a quest to increase the utilisation of ANC services in rural areas, stakeholders, including the Ministry of Health, should focus on strengthening the Community-based Health Planning and Services (CHPS) programme. The CHPS programme aims to increase access to healthcare services, especially in rural areas.[43 44]

We also found that young women (15–24 years) were more likely to underuse ANC services as well as start ANC visits late. Similarly, studies in Myanmar[5] and Southwest Ethiopia[12] revealed that young women especially adolescents had a higher risk of late initiation of ANC visits. The finding of this study could be explained by the fact that younger women may not recognise pregnancy signs and symptoms early. They may also try to conceal pregnancy leading to late initiation of ANC visits.[5 45–47]

Women who had given birth to six or more children were more likely to underuse ANC services as well as start ANC visits late. Mothers who have had multiple births might have gathered some experiences, hence they may delay starting ANC visits or underuse maternal health services.[48 49] The low utilisation of ANC services among multiparous women may be due to negative experiences with previous ANC visits, taking care of children and constraints on family resources.[49 50] Moreover, based on experiences from previous pregnancies, multiparous women may think that they know much about the signs of pregnancy-related complications, hence they may delay in accessing ANC services. It is, therefore, crucial to prioritise multiparous women in programmes that seek to increase ANC utilisation.[49] The essence of early initiation of ANC visits should be re-echoed as well as the consequences of late initiation and underutilisation of ANC services.

Recommendations and implications for public health and policy

This study provides empirical evidence on the correlates of late initiation and underutilisation of the WHO's recommended eight or more ANC visits among Ghanaian women. We analysed nationally representative data; hence the findings of this study can be generalised to the population as well as inform national maternal health policies and programmes. This study revealed the gaps in ANC coverage in Ghana using WHO's recommendation as a yardstick. Going forward, it is crucial to strengthen existing maternal health interventions, including the Free Maternal Health Policy and CHPS initiative. Investing more resources in the CHPS initiative can help bridge the urban–rural inequalities in the utilisation of maternal health services. It is also recommended that interventions aimed at increasing ANC utilisation should prioritise women of low socioeconomic backgrounds.

CONCLUSION

This study has demonstrated that the utilisation of ANC services in Ghana is below WHO's standard. The majority of women in Ghana attain less than eight ANC visits during pregnancy and one-third make their first ANC visit after the first trimester of pregnancy. Underutilisation of ANC services was influenced by parity, maternal age, socioeconomic status, place of residence and geographical region. Late initiation of ANC visits was influenced by parity, socioeconomic status, maternal age and geographical region. Going forward, maternal health interventions should prioritise young, multiparous and women of poor socioeconomic backgrounds to help increase ANC coverage in Ghana. Future research should focus on household and health system factors that influence the utilisation of ANC among women of reproductive age. Moreover, future studies may explore health professionals' and mothers' perspectives on barriers to early initiation and optimum utilisation of ANC services.

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