Research Article

Timely Attendance of the First Antenatal Care among Pregnant Women Aged 15–49 Living with HIV in Juba, South Sudan

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Timely attendance of the first antenatal care (ANC) is the period in which pregnant women visit ANC less than four months of pregnancy. There is a paucity of data on timely first ANC attendance and its associated factors among pregnant women living with human immunodeficiency virus (HIV) in Juba. The aim of this study was to investigate timely attendance of the first ANC visit among pregnant women living with HIV. Institutional cross-sectional study was conducted in three public health facilities in Juba by convenience sampling from January 2019 to December 2019. Pearson's chi-squared test was conducted for bivariate analysis and variables with probability values (p values) less than 5% were considered as statistically significant for multivariable analyses using Fisher's exact test. At the multivariate level, binary logistic regression analysis was conducted. Out of the 192 participants studied, 27 (14.1%) had timely first ANC attendance as recommended and 165 (85.9%) attended first ANC at four months and above. Distances (adjusted risk ratio [aOR], 7.14; 95% confidence interval [CI], 1.40–36.68), ANC card (aOR, 3.48; 95% CI, 1.17–10.40), waiting time ([aOR], 0.04; 95% CI, 0.01–0.75), and prevention of mother-to-child transmission (PMTCT) services (aOR, 0.12; 95% CI, 0.03–0.56) were the factors associated with timely first ANC attendance. Health education interventions targeting pregnant women attending ANC at health facilities should focus on increasing knowledge and awareness of the importance of timely first ANC attendance.

1. Introduction

Timely attendance of antenatal care (ANC) is the period in which pregnant women visit ANC less than four months of pregnancy [1]. Timely ANC visit connects pregnant women to the healthcare professionals where they are able to know the status of their pregnancy, estimated gestation age, and expected date of delivery (EDD) [2]. Timely ANC visit is an entry point for pregnant women to receive health education and preventive services such as PMTCT and identify other pregnancy-related complications at an early stage [3]. Timely ANC is very advantageous to pregnant women, and several studies have linked timely ANC attendance to skill birth attendants and increased opportunity of diagnosis and sufficient perinatal care [4–6]. Globally, approximately 830 women die every day from preventable causes related to

pregnancy and childbirth of which the sub-Saharan African region accounts for 550 of this death compared with 5 in the developed countries [7]. In 2019, there were 36.8 million people living with HIV globally [8]. Sub-Saharan Africa recorded the highest number of incident cases at 83.3% of the global number of incident cases, 78.5% of the global number of deaths, and 74.1% of the global number of people living with HIV. Regional disparities in HIV incidence and mortality among people aged 15–49 shows that HIV incidence rate was recorded at 218.1 cases per 100,000 people living with HIV and 87.2 deaths per 100,000 people: at the national level, the HIV incidence ranged from 2.8 cases per 100,000 people to 1585.9 cases in Lesotho [9]. Mozambique had the highest HIV incidence with 2805.9 cases per 100,000 people, with HIV mortality of 1163.0 deaths per 100,000 people.

As part of sub-Saharan Africa, South Sudan has been considered among countries with the worst maternal mortality outcome of 789 deaths per 100,000 live births [10].

Studies conducted on timely ANC attendance and its associated factors revealed that the majority of women initiate their first ANC visit after 12 weeks of pregnancy [11,12]. Studies have identify many factors such as maternal age, level of educational, low monthly income level, ANC history, and parity as determinant of timely ANC visits [4,13,14]. In developing countries, a few studies have regarded maternal and husband education level, available ANC services, women's media exposure, obstetric history, and employment as factors affecting timely ANC attendance [12,15,16]. The World Health Organization (WHO) in 2016 promoted the antenatal care model to prevent perinatal death and improve women's experience of health care with a minimum number of eight ANC contact for all pregnant women with the first ANC visit schedule within the first 12 weeks of pregnancy [17]. Though the new WHO 2016 updated ANC visit has been recommend, South Sudan is still using the previous 4 ANC visit recommended by the WHO [18]. There is scarcity of data on first ANC attendance among pregnant women living with HIV. There is a paucity of data on timely first ANC attendance and its associated factors among pregnant women living with HIV in Juba. Studies have shown that poor timely attendance of the first ANC is associated with obstetric labor, stillbirth; poor PMTCT, maternal mortality, and increased government health expenditure. This has subsequently contributed to poor health conditions among women. It is from the above background that the study investigated the timely attendance of the first ANC and its associated factors.

2. Methods

2.1. Study Area and Period. This study was conducted in three public health facilities in Juba during the period between January 2019 and December 2019.In Juba there are two public hospitals and numerous health centers. This study was conducted in three public health facilities that included Juba Teaching Hospital (JTH), Gurie, and Munuki Primary Health Care Centres. These public health facilities were selected purposively because the provided ANC and integrated HIV services. JTH is a national hospital and the only referral hospital within South Sudan that serves the ten states of South Sudan with a population of 9.8 million people [19]. The hospital has an inpatient and outpatient department that offers curative, preventive, and rehabilitative health services [20]. Gurie and Munuki Primary Health Care Centres are both managed by the State Ministry of Health Central Equatoria State with support from International Organizations. Both Primary Health Care Centers serve an estimated population of about 140,000 annually with outpatient service.

2.2. Study Design and Sample Size Calculation. Institutional cross-sectional study was conducted in Juba by convenience sampling from among 192 respondents out of a sample of 239 (80% response rate) pregnant women living with HIV aged 15–49 attending ANC services in public health facilities in Juba. The sample size for this study was determined using the Morgan table of sample size determination. Records were obtained from the public health facilities and corresponded to their given numbers within Morgan's table. Desired sample sizes per health facility were obtained using a probability proportionate to size. ANC records were obtained from the three health facilities in Juba from which the monthly estimates of pregnant women living with HIV were 500 (Juba Teaching Hospital 200, Gurie PHCC 180, and Munuki PHCC 120). Based on Morgan formula table, the estimated number of pregnant women living with HIV who attended ANC in the three health facilities within the period of 9 months corresponded to a sample size of 217. To account for nonresponse rate, an adjustment of 10% was added to the sample size. The study participants were selected using convenience sampling technique for interviews based on their arrival time and readiness to consent.

2.3. Data Collection Tools and Procedures. Quantitative data for this study were collected using a pretested structured questionnaire among all eligible pregnant mothers living with HIV who were enrolled in the ANC clinic. The questionnaire was designed in English, and a highly skilled and fluent specialist in Arabic was hired to translate to Arabic language and then back to English for consistency. The study involved three research assistants who were nurses and health educators and who had knowledge on HIV ,ANC and communication skills required for interviewing the respondents. The research assistants recruited were trained on research protocols focusing on key aspects of sampling, storage, handling of data, and ethical considerations. The research tools were pretested on 15% of the sample size and among respondents with similar characteristics as those of actual respondents. Pretest was conducted in a nearby health facility out of the actual population of the study to conform to the principle of validity and reliability of the tools before proceeding with data collection. Before the participant's enrollment, informed consent was obtained (the informed consent form was translated into the local language, Arabic Juba language).

2.4. Study Variables. The outcome variable for this study was "timely attendance of the first ANC" defined as ANC visit within the first 12 weeks of pregnancy. The outcome variable was measured as yes or no using a binary scale. Independent variables in the study that was considered as potential factors to timely first ANC included maternal factors (number of children, ever diagnosed with complication in previous pregnancy, gravida, to acquire ANC card, and to ensure safe delivery) and health facility factors (distance from home to health facility in kilometers, distance affects timely ANC visit, transport cost to health facility in South Sudanese pounds, and waiting time at ANC in hour).

2.5. Data Management and Analysis.

2.5. Data Management and Analysis. Data entry for this study was conducted by creating a data entry field in EpiData version 3.1 [21], and all categorical responses were put on check to eliminate errors and inconsistent data. Descriptive analysis was conducted for independent variables using frequencies and percentages. Pearson's chi-squared test was conducted for bivariate analysis, and variables with probability values (p values) less than 5% were considered as statistically significant for multivariable analyses using Fisher's exact test. At the multivariate level, binary logistic regression analysis was conducted to determine factors independently associated with the outcome by using the adjusted odds ratio. The variable age in this study was analyzed with mean. The age variable was categorized into groups to determine whether there was a relationship between age group and first ANC attendance.

3. Ethical Considerations

This study was approved by Clarke International University Research Ethics Committee, CIU-REC (reference # CIU-REC/0137) and an administrative approval from Ministry of Health, South Sudan (MOH/ERB 29/2019). All participants that participated in the study provided written informed consent and were free to withdraw at any stage of the interview if they so wished. Research codes were used instead of the respondent's name to ensure anonymity.

4. Results

4.1. Socio-Demographic Characteristics of Participants. Table 1 shows the socio-demographic characteristics of participants. Of the 192 participants, 75 (39.3%) were aged 25 to 29 and the mean age was 27.72 ± 4.49 years. 168 (87.5%) of the participants were married, 55 (28.6%) ended with a secondary level of education, 94 (49.0%) were Catholic, 164 (85.4%) lived in an urban setting, 102 (53.4%) were not employed, and 166 (86.5%) had married an employed spouse.

4.2. Timely Attendance of the First ANC. Figure 1 is a bar graph that shows the timely attendance of the first ANC among the 192 participants. The results indicated that 27 (14.1%) participants had attended the first ANC timely.

In Table 2, most participants who had attended the first ANC visit were 25 to 29 years of age ($n = 9$, 33.3%), were married ($n = 23$, 85.2%), ended with primary education level ($n = 15$, 55.6%), were of Catholic religion ($n = 12$, 44.4%), were urban residents ($n = 23$, $n = 85.2$%), had employed spouse ($n = 25$, 92.6%), and were employed ($n = 17$, 65.4%). Results indicated that timely attendance of first ANC did not differ by socio-demographic factors since the p values were above 0.05.

4.3. Bivariate Analysis of Maternal Factors and Timely Attendance of the First ANC. In Table 3, most participants who had attended the first ANC visits had 2 to 4 children ($n = 16$, 59.3%), had never been diagnosed with complications from previous pregnancies ($n = 24$, 88.9%), and were multigravida ($n = 134$, 81.2%). However, the participants differed on the

TABLE 1: Socio-demographic characteristics of participants.

| Variables	Level	Total, $n = 192$
Age group	15 to 19	10 (5.2)
	20 to 24	34 (17.8)
	25 to 29	75 (39.3)
	30 to 34	61 (31.9)
	34 and more	11 (5.8)
	Mean (SD)	27.72 (4.49)
Marital status	Single	10 (5.2)
	Separated	14 (7.3)
	Married	168 (87.5)
Level of education	None	46 (24.0)
	Primary	77 (40.1)
	Secondary	55 (28.6)
	Tertiary	14 (7.3)
Religion	Catholic	94 (49.0)
	Protestant	58 (30.2)
	Others	40 (20.8)
Residence	Urban	164 (85.4)
	Rural	28 (14.6)
	No	43 (22.4)
Employment status of husband	Employed	166 (86.5)
	Unemployed	26 (13.5)
Employment status of the mother	Employed	89 (46.6)
	Unemployed	102 (53.4)
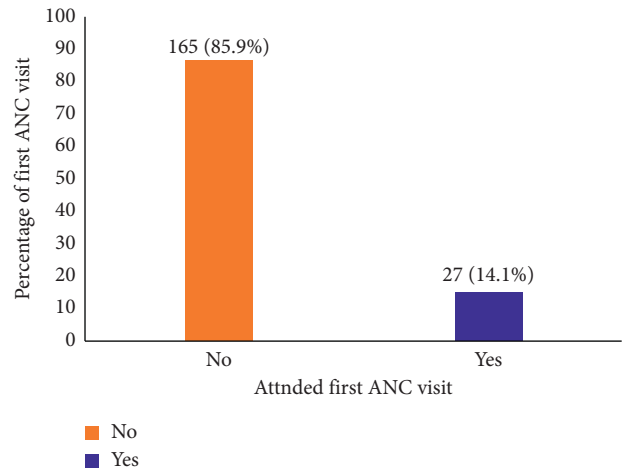
FIGURE 1: Bar graph showing participant attendance of first ANC visit. Bivariate analysis of socio-demographic factors and timely attendance of the ANC.

reasons for starting ANC, namely, PMTCT services ($p < 0.001$) and acquisition of ANC cared ($p < 0.001$), as shown in Table 3.

4.4. Bivariate Analysis of Health Facility Factors and Timely Attendance of the First ANC. In Table 4, most participants who had attended the first ANC lived within less than or equal to a 5-kilometer radius to the health facility ($n = 20$, 74.1%), reported distance had not affected them from attending ANC ($n = 25$, 92.6%), incurred a transport costs of between 100 and 500 South Sudanese pounds ($n = 16$, 59.3%), and had waited to receive ANC services for more

TABLE 2: Bivariate analysis of socio-demographic factors and timely attendance of the first ANC.

| Variables | Level | Attended first ANC? | | | p value |
		No $n = 165(85.9\%)$	Yes $n = 27(14.1\%)$	Total $N = 192$	
	15 to 19	9 (5.5)	1 (3.7)	10 (5.2)	0.291
	20 to 24	29 (17.7)	5 (18.5)	34 (17.8)	
Age group	25 to 29	66 (40.2)	9 (33.3)	75 (39.3)	
	30 to 34	53 (32.3)	8 (29.6)	61 (31.9)	
	34 and more	7 (4.3)	4 (14.8)	11 (5.8)	
	Mean (SD)	27.56 (4.42)	28.70 (4.83)	27.72 (4.49)	0.221
	Single	9 (5.5)	1 (3.7)	10 (5.2)	0.676
Marital status	Separated	11 (6.7)	3 (11.1)	14 (7.3)	
	Married	145 (87.9)	23 (85.2)	168 (87.5)	
	None	42 (25.5)	4 (14.8)	46 (24.0)	0.193
Level of education	Primary	62 (37.6)	15 (55.6)	77 (40.1)	
	Secondary	50 (30.3)	5 (18.5)	55 (28.6)	
	Tertiary	11 (6.7)	3 (11.1)	14 (7.3)	
	Catholic	82 (49.7)	12 (44.4)	94 (49.0)	0.769
Religion	Protestant	50 (30.3)	8 (29.6)	58 (30.2)	
	Others	33 (20.0)	7 (25.9)	40 (20.8)	
	Urban	141 (85.5)	23 (85.2)	164 (85.4)	1
Residence	Rural	24 (14.5)	4 (14.8)	28 (14.6)	
	No	39 (23.6)	4 (14.8)	43 (22.4)	
Employment status of husband	Employed	141 (85.5)	25 (92.6)	166 (86.5)	0.483
	Unemployed	24 (14.5)	2 (7.4)	26 (13.5)	
Employment status of mother	Employed	72 (43.6)	17 (65.4)	89 (46.6)	0.064
	Unemployed	93 (56.4)	9 (34.6)	102 (53.4)	

TABLE 3: Bivariate analysis of maternal factors and timely attendance of the first ANC.

| Variables | Level | Attended first ANC | | | P Value |
		No $n = 165(85.9\%)$	Yes $n = 27(14.1\%)$	Total $n = 192$	
	0 to 1	32 (19.4)	6 (22.2)	38 (19.8)	0.766
Number of children	2 to 4	92 (55.8)	16 (59.3)	108 (56.2)	
	More than 4	41 (24.8)	5 (18.5)	46 (24.0)	
Ever diagnosed with complication in previous pregnancy		45 (27.4)	3 (11.1)	48 (25.1)	0.116
		119 (72.6)	24 (88.9)	143 (74.9)	
Gravida	Prim gravida	31 (18.8)	6 (22.2)	37 (19.3)	0.876
	Multigravida	134 (81.2)	21 (77.8)	155 (80.7)	
	Reasons for timely ANC				
PMTCT	Yes	84 (50.9)	25 (92.6)	109 (56.8)	<0.001
	No	81 (49.1)	2 (7.4)	83 (43.2)	
To acquire ANC card	Yes	149 (90.3)	17 (63.0)	166 (86.5)	<0.001
	No	16 (9.7)	10 (37.0)	26 (13.5)	
	Yes	1 (0.6)	0 (0.0)	1 (0.5)	0.309
To ensure safe delivery	No	24 (14.5)	7 (25.9)	31 (16.1)	
	Unsure	140 (84.8)	20 (74.1)	160 (83.3)	

Note. ANC, antenatal care: PMTCT, prevention of mother-to-child transmission; n, number of samples.

than 30 hours ($n = 23$, 85.2%). Among these health facility factors, participants differed on distance reportedly affecting first ANC visits ($p = 0.003$) and waiting time at the ANC to receive services ($p = 0.003$).

4.5. Binary Logistic Regression Analysis of Factors Associated with Timely Attendance of the First ANC Visit. In unadjusted analysis (uOR) (Table 5), timely attendance of the first

ANC attendance was associated with participants reporting that they had attended the first ANC not to receive PMTCT services (unadjusted odds ratio (uOR), 0.08; 95% (CI, 0.02–0.36), not to receive ANC card (uOR, 5.48; 95% CI, 2.15–13.97), distance not affecting ANC attendance (uOR, 7.92; 95% CI, 1.81–34.58), and waiting time of 2–3 hours at the ANC clinic (uOR, 0.02; 95% CI, 0.01–0.03). After adjusting for all statistically significant variables, attendance of timely ANC for reasons of not

TABLE 4: Bivariate analysis of health facility factors and timely attendance of the first ANC.

Attended first ANC

Variables	Level	No $n = 165(85.9\%)$	Yes $n = 27(14.1\%)$	Total $N = 192$	p value
Distance from home to health facility in kilometers	≤5	93 (56.4)	20 (74.1)	113 (58.9)	0.216
	5 to 10 km	55 (33.3)	5 (18.5)	60 (31.2)	
	>10 km	17 (10.3)	2 (7.4)	19 (9.9)	
Distance affects timely ANC visit	Yes	64 (38.8)	2 (7.4)	66 (34.4)	0.003
	No	101 (61.2)	25 (92.6)	126 (65.6)	
Transport cost to health facility in South Sudanese pounds	<100	29 (17.6)	8 (29.6)	37 (19.3)	0.304
	100 to 500	108 (65.5)	16 (59.3)	124 (64.6)	
	>500	28 (17.0)	3 (11.1)	31 (16.1)	
Waiting time at ANC in hour	≤1 hour	1 (0.6)	2 (7.4)	3 (1.6)	0.003
	2–3 hours	46 (27.9)	2 (7.4)	48 (25.0)	
	≥3 hours	118 (71.5)	23 (85.2)	141 (73.4)	

Note. ANC, antenatal care; n, number of samples.

TABLE 5: Factors associated with first antenatal care in logistic regression analysis.

Variables	Level	Attended first ANC		Binary logistic regression analysis			
				Unadjusted		Adjusted	
		Yes		uOR	95% CI	aOR	95% CI
Started ANC to receive PMTCT services	Yes	84 (50.9)	25 (92.6)	Ref		Ref	
	No	81 (49.1)	2 (7.4)	0.08***	(0.02, 0.36)	0.12**	(0.03, 0.56)
Attended ANC to acquire ANC card	Yes	149 (90.3)	17 (63.0)	Ref		Ref	
	No	16 (9.7)	10 (37.0)	5.48***	(2.15, 13.97)	3.48*	(1.17, 10.40)
Distance affects ANC visit	Yes	64 (38.8)	2 (7.4)	Ref		Ref	
	No	101 (61.2)	25 (92.6)	7.92**	(1.81, 34.58)	7.16*	(1.40, 36.68)
Waiting time at ANC in hour	≤1 hour	1 (0.6)	2 (7.4)	Ref		Ref	
	2 to 3 hours	46 (27.9)	2 (7.4)	0.02**	(0.01, 0.35)	0.04*	(0.01, 0.75)
	≥3 hours	118 (71.5)	23 (85.2)	0.1	(0.01, 1.12)	0.2	(0.01, 3.01)

Note. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$; *all odds ratios* are exponentiated; 95%, unadjusted analysis (uOR), adjusted odds ratio (aOR), confidence interval (CI) for odds ratios are in brackets.

receiving PMTCT service compared with receiving PMTCT service was associated with lower odds of first ANC attendance (adjusted odds ratio (aOR), 0.12; 95% CI, 0.03–0.56); attendance of timely ANC visits not to receive an ANC card relative to the need to receive an ANC card was associated with increased odds of first ANC visit (aOR, 3.48; 95% CI, 1.17–10.40); participants with distances that had no effect on ANC visit compared to those with distances that had effect on ANC visit had increased odds of first ANC attendance (aOR, 7.14; 95% CI, 1.40–36.68); and waiting at the ANC for 2 to 3 hours compared to 1 hour was associated with lower odds of first ANC visit (aOR, 0.04; 95% CI, 0.01–0.75).

5. Discussion

ANC is a key health intervention for reducing maternal morbidity and mortality. Considering South Sudan with one of the highest maternal mortality in the world associated with poor access to quality health and reproductive services [22], when ANC is conducted appropriately and timely by pregnant mothers, there is a potential to save lives by identifying and preventing pregnancy-related complications at an early stage and institute proper management

[6]. The findings from this study revealed that timely attendance of the first ANC was by far very low (14.1%) in Juba. These findings show that a substantial proportion (85.9%) of pregnant women are not benefiting from first ANC services as recommended by the WHO [23]. These findings have important implications on maternal health and the outcome of pregnancy. Studies have shown that when women initiate first ANC visit late, the risk of maternal and neonatal mortality increases, and secondly, it becomes difficult for the health facility to implement ANC strategies effectively [24]. The findings of this study indicate a need for Ministry of Health to design health education interventions targeting pregnant mothers attending ANC at lower health facilities to change their mindset and increase knowledge and awareness on the importance of first ANC visit and its implications. The proportion of pregnant mothers adhering to the first ANC visit in this study is low compared with studies conducted in Pakistan (48%) [25], Ethiopia (35.4%) [26], and Rwanda (25%) [27]. Such a relatively high difference in these studies could be attributed to the socio-demographic characteristics of the study population, level of maternal knowledge on the importance of the first ANC visit, media coverage, and variation in study settings.

This study found that mothers who attended ANC clinics not to receive ANC cards were three times more likely to adhere to the first ANC visits compared to mothers who attended first ANC with the reason of getting ANC cards. This finding differs from a study conducted in Uganda where pregnant women believed that having ANC cards was a guarantee for health facility delivery and this was the main reason for attending ANC visit [28]. There is limited literature with regard to the association between first ANC visit and attending first ANC not to receive ANC card in previous studies. In this study, it could be attributed that pregnant mothers had poor knowledge on the importance of services such as receiving ANC cards during the first visit; furthermore, for these mothers, attending health services was not related to ANC cards, probably these mothers might have been aware of their HIV status. As a result, they were more concern with getting other health services such as antiretrovirals(ARVs); rather than ANC card, more ever women who even come after six months of pregnancy were given ANC card by the health facilities. These findings suggest health promotion and education activities targeted at increasing maternal knowledge on the benefits of first ANC visit should be paramount.

In this study, the fact that distance was instrumental in affecting ANC visits among the respondents is worth noting. Pregnant mothers who reported having no effect of distance were almost eight times more likely to initiate first ANC within the first 12 weeks of pregnancy. This finding is supported by previous studies conducted in Cameroon [29], Ethiopia [13], and Uganda [30] where a positive association between distance to the health facilities and initiation of first ANC visit was found among pregnant women who lived within a shorter distance and travelled less than 30 minutes to one hour. This finding is supported by the fact that the longer the distance from home to the nearest health facility, the poor the utilization of healthcare services. This could be because distance affects the utilization of healthcare services in terms of cost of transport from one point to another, and distance limits easy access to such services. Furthermore, in this study the positive association between distance and timely attendance of the first ANC can be supported by the fact that the majority of the respondents lived in urban areas where these facilities were located within a distance of 5 km with a transport fare ranging between 100 and 500 South Sudanese pounds (SSP) that could be afforded by the majority of mothers. These findings suggest that the Ministry of Health should design and implement policies that ensure the introduction of equitable, effective, and efficient healthcare delivery services closer to mothers, and hence, travel distances from home to the nearest health facility will be reduced.

In this study, pregnant women living with HIV who attended ANC clinics not to receive PMTCT services were less likely to adhere to the first ANC visits. Rigorous searches have been conducted on previous literature; however, no substantial studies have been found that explains the significant relationship between first ANC and PMTCT service uptake among pregnant women living with HIV. However, a few studies cited poor maternal knowledge and awareness, stigma, and discrimination as barriers of PMTCT utilization during ANC visit [31]. Another study cited confidentiality, dissatisfaction with health worker, and poor support from male partners [32]. In this study, poor utilization of PMTCT can be attributed to the HIV status of the mothers with majority (81.2%) being multigravida with parity of 2–4 (55.8%), and these mothers might be relying on their previous experience. Secondly, these findings suggested that mothers were already aware of their HIV status and they might have been receiving PMTCT services from other health facilities where they were comfortable; hence, they were attending ANC clinic only for routine follow-up and checking the status of pregnancy.

Waiting time before being attended by a healthcare worker acted as a serious barrier to first ANC utilization. Mothers who reported a waiting time of 2–3 hours were less likely to achieve the recommended timing of the first ANC visit. Findings from other studies found waiting time as a negative barrier for ANC utilization [33–36]. In Mozambique, client at the health facility added that waiting time acted as a barrier for seeking multiple ANC visits as well as increasing their direct cost through purchasing of food or packing food from home [37].

Waiting time of about 2–3 hours could be attributed to the fact that ANC service only begins after health education sessions have been conducted to a sizable number of pregnant mothers; as a result, mothers who reported earlier had to wait until a reasonable number of women are present in the health facility. This results in clients spending long hours in the health facility during ANC visit; hence, reducing the chances of the first ANC visit, pregnant mothers would rather attain to others household chores, then spending longer hours at the health facility. From a prospective of service delivery, this study suggests that ANC clinic should address waiting time at the facility by scheduling different ANC interventions.

5.1. Study Strengths and Limitations. Considering the importance of first ANC visit, this study is one of the few and the first studies to investigate the timely attendance of a first ANC visit among pregnant women living with HIV. The findings of this study will be a good source of reference for other upcoming studies and will inform policies that may lead to policy formulation and implementation. However, the study had a number of limitations that might have affected the results. The data collected were self-reported by the respondents; as a result, there might have been recall bias on the exact weeks of pregnancy during the first ANC visit, which might have affected the result of the study. Lastly, this study was conducted at a point in time during pregnancy, so the pregnancy outcome could not be determined by the study.

6. Conclusion

Timely attendance of the first ANC in this study was low (14.1%). Distance to the health facilities and attending ANC not to receive ANC cards were positive influencers of timely

first ANC visit. Waiting time for 2–3 hours at the health facility and attending ANC not to receive PMTCT services were negatively associated with a timely first ANC visit. Ministry of Health should upgrade the timing of first ANC booking based on WHO 2016 recommendations. The low coverage of first ANC visit calls for a need to improve health education interventions targeting pregnant mothers attending ANC at the health facilities and communities with focus on increasing knowledge and awareness of the importance of timely attendance of the first ANC. The study recommends further qualitative study to explore the reasons for low timing of first ANC.

Abbreviation

ANC: Antenatal care
HIV: Human immunodeficiency virus
PMTCT: Prevention of mother-to-child transmission
PHCC: Primary healthcare unit
WHO: World Health Organization.

Data Availability

The dataset used or analyzed for this manuscript is available in excel sheet that can be found by requesting the corresponding author.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

ANB conceptualized and designed the study and carried out data collection. JI analyzed and interpreted the data. ANB drafted the initial manuscript and approved the final manuscript. AF guided/supervised the entire process from conceptualization to report writing and participated in manuscript writing and approval of the final manuscript. ANB, FA, and JI reviewed and edited the final manuscript. All authors read and approved the final manuscript.

Acknowledgments

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