FACTORS ASSOCIATED WITH RECOMMENDED ANTENATAL CARE ATTENDANCE AMONG POSTPARTUM MOTHERS AT SELECTED HEALTH FACILITIES IN KICUKIRO DISTRICT, RWANDA

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Abstract

Full attendance at prenatal care services has been approved as an intervention that decreases the deaths of mothers and their neonates. The study aimed to assess factors associated with recommended antenatal care attendance among postpartum mothers at selected health facilities in Kicukiro District. This study used a quantitative approach and a descriptive cross-sectional design. A total of 305 postpartum mothers estimated using the Yamane formula were sampled to participate in this study. Systematic sampling with a kth value of three was used to obtain participants in each selected health facility. A well-structured data collection tool composed of demographic characteristics of participants, recommended antenatal care attendance, socio-economic factors, and health facility factors were applied for data collection. Validity and reliability of the questionnaire were tested before data collection at study areas, and a Cronbach's Alpha of over 0.75 was recorded. Data analysis was done using the Statistical Package for Social Sciences version 21. Descriptive statistics were used to summarize the demographic characteristics of respondents and the prevalence of ANC attendance in frequency and percentage. With a significance level of 5%, bivariate and multivariate analyses were used to examine the associations between the study's variables. Significant variables were those with a p-value less than 0.05. Prior to the data collection, Mount Kenya University Rwanda's Institute of Postgraduate Studies and Research issued an introduction letter to the researcher. The researcher requested permission to collect data, and authorization letters were given by selected health facilities before meeting with respondents to request their consent. The study's respondents freely completed the consent form to participate. Analysis of the demographic characteristics of respondents indicated that the mean age was 28.05 years (SD=5.74 years) and the mean parity was 2.1 (SD=1.2). Most participants were either single, separated, divorced, or widowed (67.5%). Regarding participants' educational attainment, the majority were educated up to primary education (51.8%) while most of their partners had primary education. Considering religion, the highest percentage (96.7%) were Christians. Considering the location of one's home, 53.1% and 46.9% of participants lived in urban and rural areas, respectively. The majority of postpartum mothers (63.9%) did not attend recommended antenatal care visits, and 64.3% initiated their ANC attendance within 12 weeks. Marital status (AOR = 2.240, 95% CI: [1.213–4.139], p = 0.008), parity (AOR = 6.445, 95% CI: [3.137–13.240], p=0.001), health insurance

use (AOR = 3.683, 95% CI: [1.805-6.675], p = 0.048), and the cost of ANC services and laboratory tests (AOR = 9.699, 95% CI: [2.42-38.78], p=0.001) influenced postpartum mothers to attend recommended ANC visits. The researcher recommends that activities related to health education regarding recommended ANC attendance and its importance should be reinforced in Kicukiro District. The Ministry of Health should plan free or subsidized maternal and child health services to increase recommended antenatal care uptake.

Key words: Factors, Recommended antenatal care attendance

Introduction

Greater than 210 million married women and adolescent girls became pregnant per year around the globe, unfortunately only 71% of women received prenatal care [1]. Across the developed world and the developing world; 98% and 68% of expectant mothers attended prenatal care at least once respectively. These trends showed that antenatal care was more practicable in developed countries than in developing countries [2].

Among developed countries, China reported having high attendance, with a rate of 61.87% of expectant mothers who received ANC in the first 12 weeks, 78.79% at least five times, 39.93% at least eight times, and 16.66% at least 11 times [3]. In the United Kingdom, expectant mothers were encouraged to attend prenatal care within the first trimester but they might book late for antenatal care due to the following risk factors: ethnicity, awareness, being unaware of ANC importance, language barriers, previous ANC experience, age, cultural beliefs, and healthcare professional issues and having many children [4].

In developing countries, the survey done in Nepal revealed that among women who did not utilize antenatal care, attended less than 4 visits, did neither take iron nor consume deworming tablets and folic acid; and women who did not eat additional food stuff during the course of pregnancy, 19.4% delivered low birth weight babies [5]. In Africa, more countries reported to have low attendance to ANC clinic. Different figures mentioned positive trend on ANC attendance in some african countries like Ethiopia. The percentage of ladies in Ethiopia reported to attend 4 and more ANC visits increased from 10.0% in 2000 to 32.0% in 2016[6].

Sub-Saharan Africa was also reported to have poor antenatal care attendance at the rate of 58.53%, the Southern Region and Eastern Region of Africa had recommended ANC attendance at the rate of 78.86% and 53.39% respectively. The associated factors were: either residing in rural or urban area, maternal education, literacy level, partner's schooling, maternal employment status, lady's autonomy for health care decision making, family income, media disclosure, accessibility to healthcare services, wanted pregnancy and birth order [7].

In Rwanda, the recent survey showed that 98% of women attended at least one ANC visit, 47% had 4 or more ANC visits/ contacts and 59% of ladies went for their 1st visit within the 12 weeks of gestational age [8]. Furthermore, another study done in Rwanda found that the odds of low attendance of ANC visits was elevated amongst ladies of equal and more than 31years old, among women with poor social support[9].

There was no previous study on recommended ANC attendance and associated factors among recently delivered ladies in Kicukiro District, Rwanda. Therefore, this investigation aimed to identify factors associated with recommended prenatal attendance which would help Kicukiro District to review strategies related to ANC attendance.

Materials and methods

Study settings

The study was conducted in Kicukiro District at Masaka District Hospital and 5 health centers (HC): Masaka HC, Kabuga HC, Kicukiro HC, Gikondo HC and Gahanga HC in Kicukiro District, Rwanda.

Study design

This exploration used the cross sectional study design, using quantitative approach. It postulated a picture of the effect and the features similar to it, at a determined pattern. Given that this research aimed at assessing the predictors associated with recommended antenatal care attendance, it was ideal since it allowed the researcher to collect data all at once.

Study population

The participants in this study were postpartum mothers, who delivered at selected health facilities in Kicukiro District. Previous statistics from selected health facilities showed that there were estimated 900 deliveries per month.

Sample size and sampling technique

Sample size was 305 postpartum mothers calculated using the Yamane formula. Probability, systematic sampling technique was used to choose participants. Probability samples are the best because they ensure representativeness and precision.

At every selected health facility, sampling started at the first postpartum mother who was occupying the first bed in the room considering health facilities beds numbering. The sampling interval (k^{th} value) was respected as calculated from the population size over sample size. The sampling interval (900/305) known as skip was three; meaning that the researcher sampled the first mother and jumped three in between participants till the calculated sample size for each selected health facility was reached.

Data collection instrument

A well-designed questionnaire comprising of close-ended questions was used for data collection from postpartum women. The questionnaire was designed in English language and it has been translated in Kinyarwanda. This ensured greater comprehension for women who had issues with English language.

It consisted of four parts: section one was demographic characteristics of respondents, section two was recommended ANC attendance, section three was socio-economic factors and section four was health facility factors.

Data analysis

Analysis of data was performed utilizing Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics were computed for all objectives. Pearson Chi-square and regression analyses were used to test the association between dependent and independent variables. In

logistic regression, the adjusted odd ratios and 95% Confidence Interval were computed and recorded as measures of association. The significance level in the analysis was set at 5%. Significant variables were those with p-value <0.05.

Ethical consideration

The data collection letter was provided by Mount Kenya University Institute of Postgraduate studies and Research. Permissions for proceeding with the study data collection were obtained from selected health facilities. After clear explanation of research's purpose, the consent was requested from respondents. Before distributing the questionnaires, all participants were assured of their option to decline to respond any of the questions.

Moreover, participants were mindful of the fact that they should withdraw from the study at any time. Non-disclosure of response was also ensured. The participation was voluntary and there was no motivation for the participants.

Results

Demographic characteristics of respondents

Overall characteristics of respondents presented in table 1 showed that the mean age of the participants was 28.05 years (SD 5.74 years), while the mean parity of the participants was 2.11 (SD 1.22). The demographic characteristics showed that the majority of respondents 172 (56.4%) were in the age range from 25-35 years. The highest percentage of the respondents 117(38.4%) were primiparous women. Considering marital status, the majority of respondents 206(67.5%) were either single, separated, divorced or widowed.

Highest percentage of respondents completed primary education 158 (51.8%), few respondents 16 (5.3%) did not attend school while some respondents from Kicukiro district have attended tertiary education 21 (6.9%). This indicates the shortage of respondents with tertiary education among the population from Kicukiro District who seek maternal health services in public health facilities. Furthermore, regarding partner's education, secondary education 114 (37.4%) and

primary education 139 (45.6%) emerged as the highest percentages respectively. The results

indicate that majority 295 (96.7%) of respondents were Christians while Muslums were 10

(3.3%). Considering residence area, 162 (53.1) respondents were residing in urban area while

143 (46.9%) respondents were residing in rural area.

Table 1: Demographic characteristics of respondents

Variables	Frequency	%
Age in years		
17-24	96	31.5
25-35	172	56.4
36-45	37	12.1
Mean (1SD,Min-Max)=28.05(5.74, 17-45)		
Parity		
One	117	38.4
Two	93	30.5
Three and above	95	31.1
Mean (1SD,Min-Max)=2.11 (1.2,1-7)		
Marital status		
Married	99	32.5
Single/separated/divorced/widowed	206	67.5
Education		
No education	16	5.2
Primary education	158	51.8
Secondary education	110	36.1
Tertiary education	21	6.9
Partner's education		
No education	21	6.9
Primary education	139	45.6
Secondary education	114	37.4
Tertiary education	31	10.2
Religion		
Christians	295	96.7
Muslims	10	3.3
Residence area		
Urban	162	53.1
Rural	143	46.9

Source: Primary data,(2022)

The results in table 2 indicated the prevalence of antenatal care (ANC) attendance as measured

against three main variables, which included recommended antenatal care attendance (≥4),

frequency of antenatal care attendance, and gravid age at the first visit as per the World Health

Organization (WHO) guide, showing that the highest number of postpartum women in Kicukiro

District did not attend recommended antenatal care visit during their pregnancy.

About 195 (63.9%) of the respondents did not attend four or more visits during their pregnancy

with only 110 (36.1%) who attended ≥4 ANC visits during their last pregnancy preceding the

study. Regarding the frequency of ANC, attending 3 times for ANC had high number with 125

(41.0%) respondents. When it came to the age of pregnancy at which respondents had their first

ANC contact, the majority of respondents met the WHO standard of having it during the first

three months. Approximately 196 (64.3%) of respondents had their first contact within the first

12 weeks, as recommended by WHO, with only 109 (35.7%) having their first ANC contact after

the first 12 weeks.

Table 2: Antenatal care attendance

Variables	Frequency	%
Recommended ANC attendance		
Yes	110	36.1
No	195	63.9
Frequency of ANC		
One	22	7.2
Two	47	15.4
Three	125	41.0
Four	91	29.8
Five	8	2.6
Six and more	11	3.6
Gestational age at first ANC		
Within 12 weeks	196	64.3
After 12 weeks	109	35.7

Source: Primary data, (2022)

The results in table 3 of bi-variable chi-square of association between socio-demographic factors

and ANC attendance indicated that the following variables: age (p-value 0.891), religion (p-

value =0.792), residence are (p-value=0.116) were not statistically significant. As result, all other

variables were statistically significant and were analyzed in multivariate.

As depicted in the table 3, there was a significant relationship between postpartum mothers' ANC attendance and their parity (p 0.001), marital status (p 0.001), maternal education (p 0.001), and partner's education (p=0.001), according to the association between socio-demographic characteristics and recommended ANC attendance.

Comparing frequencies and percent, it was found that attending ≥4 visits was elevated to 64 (37.2%) among participants who were between 25 and 35 years with respondents aged between 36-45 years recording relatively low attendance of about 13 (35.1%). The respondents with one delivery had higher number 64 (54.7%) in attending ≥ 4 visits. Furthermore, the study revealed that, the majority 60 (29.1%) of the respondents who were single attended ≥4 ANC visits during their last gestation. Regarding maternal education, the majority of respondents 54 (34.2%) who attended recommended ANC visits attained primary education. It was also indicated that 46 (33.1%) partners who attained primary with their wives attended ≥4 visits. Looking at religion, 106 (35.9%) participants who were Christians attended ≥4 visits. Finally, 65 (40.1%) of the participants who lived in rural areas attended recommended ANC visits.

Table 3: Bivariate analysis of demographic characteristics associated with recommended ANC attendance

| Variables | Recommended ANC attendance | | | | Chi-square value | p value |
| | Yes | | No | | | |
	n	%	n	%		
Age group					0.23	0.891
17-24	33	30.4	63	65.6		
25-35	64	37.2	108	62.8		
36-45	13	35.1	24	64.9		
Parity					31.64	**<0.001**
One	64	54.7	53	45.3		
Two	17	18.3	76	81.7		
Three and above	29	30.5	66	69.5		
Marital status						
Married	50	50.5	49	49.5	13.25	**<0.001**
Single/divorced/widowed	60	29.1	146	70.9		
Maternal education						

No education	1	6.3	15	93.8	17.80	**<0.001**
Primary education	54	34.2	104	65.8		
Secondary education	40	34.4	70	66.6		
Tertiary education	15	71.4	6	28.6		
Partner's education						
No education	2	9.5	19	90.5	23.373	**<0.001**
Primary education	46	33.1	93	66.9		
Secondary education	40	35.1	74	64.9		
Tertiary education	22	71	9	29		
Religion						
Christians	106	35.9	189	64.1	0.069	0.792
Muslums	4	40	6	60		
Residence area						
Urban	65	40.1	97	59.9	2.467	0.116
Rural	45	31.5	98	68.5		

Source: Primary data (2022)

The results in table 4 regarding the association between socio-economic factors and recommended ANC attendance indicated that the following variables: maternal occupation (p=0.044), health insurance use (p=0.003), cost of all ANC services and laboratory tests (p=0.001) were significantly associated with recommended ANC attendance and other variables like partner's occupation (p-value=0.441), family wealth index category (p-value =0.232), perception of transport and services' cost related to ANC (p-value= 0.761) were not statistically significant. Compared to frequencies and percentages, it was found ≥4 visits was the highest 53 (35.3%) among respondents who were housewives. Considering the partner's education, the majority 54 (34.2%) of partner's respondents who were daily labourers recorded relatively high attendance of ≥4 visits. The respondents counted among wealth index category two had higher number 55 (33.5%) in attending ≥4 visits. It was discovered that, the majority 94 (34.1%) of the respondents who possessed community based health insurance attended ≥4 ANC visits during their last pregnancy preceding the study. Regarding perception of transport and services cost related to ANC, the majority of respondents 82 (36.9%) who attended recommended ANC visits perceived the

cost as moderate. It was also revealed that 80 (32.4%) participants who paid 5,000Rwf attended

≥4 visits.

Table 4: Association between socio-economic factors and recommended ANC attendance

| Variables | Recommended ANC attendance | | | | Chi-square value | p value |
| | Yes | | No | | | |
	n	%	n	%		
Maternal occupation					9.80	**0.044**
Housewives	53	35.3	97	64.7		
Daily labourers	15	41.7	21	58.3		
Employed	9	75	3	25		
Merchants	16	32.7	33	67.3		
Farmers	17	29.3	41	70.7		
Partner's occupation					3.74	0.441
No occupation	3	33.3	6	66.7		
Daily labourers	54	34.2	104	65.8		
Employed	28	46.7	32	53.3		
Merchants	12	32.4	25	67.6		
Farmers	13	31.7	28	68.3		
Family wealth index category					4.28	0.232
Category one	8	26.7	22	73.3		
Category two	55	33.5	109	66.5		
Category three	47	42.7	63	57.3		
Category four	0	0.00	1	100		
Health insurance use					11.76	**0.003**
Community based health insurance	94	34.1	182	65.9		
Other health insurances	15	68.2	7	31.8		
No health insurance	1	14.3	6	85.7		
Perception of transport and services cost related to ANC					0.54	0.761
Low	11	30.6	25	69.4		
Moderate	82	36.9	140	63.1		
High	17	36.2	30	63.8		
Cost of all ANC services and laboratory tests					13.87	**0.001**
<5,000Rwf	80	32.4	167	67.6		
5,0000-10,0000Rwf	12	37.5	20	62.5		
>10,000Rwf	18	69.2	8	30.8		

Source: Primary data, (2022)

Regression analysis illustrated in table 5 revealed that parity, marital status, health insurance use

and cost of ANC services and laboratory tests remained statistically significant. The following

variables: maternal education, partner education and maternal occupation lost their significance in logistic regression analysis.

The result from this study found that postpartum mothers were 6 times (AOR= 6.445, 95% CI: [3.137-13.240], p<0.001) and 3 times (AOR=3.603, 95% CI: [1.776-7.306], p<0.001) more likely to attend recommended ANC visits during their first and second pregnancy respectively compared to those who were having third pregnancy and more. Respondents who were married were 2 times more likely to attend 4+ visits compared to those who were single, divorced and widowed (AOR=2.240,95%CI:[1.213-4.139], p=0.008). Postpartum mothers who used other health insurances were 3 times more likely to attend recommended ANC visits compared to those without health insurances (AOR=3.683, 95% CI: [1.805-6.675], p=0.048). Finally, respondents who paid <5,000Rwf as cost of ANC services and laboratory tests were 9 times more likely to attend recommended ANC visits compared to those who paid more than 10,000Rwf (AOR=9.699, 95% CI: [2.425-38.789], p=0.001).

Table 5: Multivariate analysis of factors associated with recommended ANC attendance

| Variables | AOR | 95% CI | | P value |
		Lower	Upper	
Parity				
One	6.44	3.13	13.24	**<0.001**
Two	3.60	1.77	7.30	**<0.001**
Three and above	REF			
Marital status				
Married	2.24	1.21	4.13	**0.010**
Single/divorced/separated/widowed	Ref			
Maternal education				
No education	2.74	0.03	45.41	0.480
Primary education	0.78	0.03	4.18	0.779
Secondary education	1.03	0.01	5.12	0.964
Tertiary education	Ref			
Partner education				
No education	7.38	0.07	2.31	0.061
Primary education	3.41	0.07	2.36	0.062

Secondary education	3.10	0.01	1.10	0.075
Tertiary education	Ref			
Maternal occupation				
Housewife	1.54	0.69	3.40	0.286
Daily labourer	0.80	0.30	2.17	0.675
Employed	0.34	0.06	1.79	0.208
Merchant	1.22	0.44	3.35	0.696
Farmer	Ref			
Health insurance use				
Community based health insurance	2.06	1.26	4.00	**0.017**
Other health insurances	3.68	1.80	6.67	**0.048**
No health insurance	Ref			
Cost of ANC services and lab tests				
<5,000Rwf	9.69	2.42	38.78	**0.001**
5,000-10,000Rwf	7.67	1.61	36.56	**0.010**
>10,000Rwf	Ref			

AOR= Adjusted Odds Ratio; **CI**= Confidence Interval

Source: Primary data, (2022)

Discussion

The study aimed at assessing factors associated with recommended antenatal care attendance among postpartum mothers at selected health facilities in Kicukiro District. Particular attention was paid to determining the prevalence of recommended ANC attendance, assessing the socio-demographic factors, examining the socio-economic factors, and establishing the health facility characteristics associated with recommended ANC attendance among postpartum mothers at selected health facilities in Kicukiro District.

This study revealed that mothers aged 25–35 had a high percentage compared with other age groups because it is the most productive age in Rwanda. Considering parity, the majority of women had one delivery. Regarding marital status, a high percentage of participants reported being either single, separated, divorced, or widowed. Considering the level of education, a large

number of mothers had primary education. A high percentage of participants reported that their partners were educated up to the primary level. The low education level of participants and their partners could explain how they were not knowledgeable and, hence, they could not take into account the requirements to attend the recommended ANC visit. Considering religion, the majority of participants were Christians. Finally, the majority of participants lived in urban area.

The findings of this study revealed that the recommended ANC prevalence among postpartum mothers was critically low. This prevalence is lower than the ones reported by different studies [8-12]. This discrepancy could be due to their different sample sizes, sampling designs, age of participants, and recall bias or respondents' misunderstanding of some questions as Rwanda Demographic and Health Survey collected data on past use of antenatal care. Rwanda Demographic and Health Survey had a large sample size, used mixed sampling design first as it used a two stage sampling design where all available women were eligible to be interviewed and considered all women from 15-49 years old. In addition, this could be explained by the reason that the present study was conducted in only one district while others were conducted countrywide.

The findings of the present study revealed that initiation of first ANC visit in the first trimester was a little bit higher than average. Similar results were found in the studies done by Billings & Shebl and National Institute of Statistic of Rwanda [4,8]. In this regards, this may be due to the fact that pregnant women had low levels of education and though antenatal care services were made available they could not go to seek them as they felt well together with their unborn babies. Contrary findings were found in the study done by Noh et al [12]. This could be due to the large sample size used compared to the present study.

The findings regarding socio-demographic factors indicated that parity and marital status were significant predictors of recommended antenatal attendance. For marital status, mothers who were married were 2 times more likely to attend recommended ANC attendance compared to

those who were either single, divorced, separated, or widowed. Similar findings were found in the studies done by Omar et al and Muchie [13,14].

The reason for married mothers' attending 4+ antenatal care visits could be justified by the support married women in Rwanda get from their partners and other extended family members as a result of ANC attendance sensitization campaign, which equally targets men and encourages them to go with their wives or partners to the clinic. Contrary findings were found in the study done by Nuamah [15].

The present study found that maternal education and maternal age were not significantly associated with attending 4+ antenatal care visits in Kicukiro District. In contrast, studies done by Adedokun & Yya and Afaya et al [16, 17] revealed that maternal education and maternal age were factors associated with recommended antenatal care attendance.

The finding regarding socio-economic factors in the present study found that health insurance use and cost of ANC services were significant factors associated with recommended ANC attendance. Similar results to this study were found in the studies done by Afya et al and Okedo-Alex et al [16, 18].

Conclusion

The majority of women who delivered during the data collection period in Kicukiro District failed to attend recommended prenatal care checkups during their previous pregnancy, according to the findings. In terms of early initiation, the majority of women attended during the first 12 weeks of their pregnancy. According to the research, the majority of socio-demographic characteristics affected recommended ANC attendance. The research also showed that parity and married status were shown to have a statistically significant relationship with suggested ANC visits. The findings of the study revealed that most socioeconomic criteria influenced respondents' attendance at ANC visits.

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Limitations of the study

This study could not be generalized, as it was cross-sectional study conducted only in Kicukiro District.

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