

Factors Associated with discontinuing Four Antenatal Care Standard Visits in Musanze

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Abstract

Background: Antenatal Care (ANC) service for pregnant women by trained health professional improve maternal and new born health outcome. It is one of the most significant means taken by the state to reduce deaths in mother and fetus. Rwanda has followed the 2001 WHO model of 4 focused ANC visits for pregnant women without past and current complications. A total of 98% women attend at least one ANC visit. However, only 47 % complete 4 ANC standard visits and 56% of women go for their 1st visit before the 4th month of pregnancy.

Objective: To determine factors contributing to low level of attending the fourth Antenatal Care standard visits.

Materials and methods: The cross-sectional and quantitative study was conducted in Musanze health center and its catchment area. The study enrolled 8 health providers and 67 pregnant women who completed 4 ANC standard visits or who failed to attend the 4th ANC visit in the study period. Study participants were recruited using a purposive sampling technique. The multivariable logistic regression model was applied by the backward elimination stepwise method to evaluate the association between dependent and independent variables.

Findings: The study showed seven factors associated with discontinuing four standard ANC visits. The respondents who had not been visited by a CHW were 2.6 times more likely not to complete four standard ANC visits as compare to their counterparts. The variable of not being visited by CHW was statistically significantly associated with discontinuing 4 standard ANC visits. The variable outlining the reasons of not completing 4 ANC standard visits reported two factors which are strongly associated with discontinuing 4 ANC standard visits. These include the respondents who reported lack of knowledge on the role of attending ANC service and the respondents who thought that doing one or two visits was enough.

Conclusion: Modifiable factors like pregnant mothers who were not visited by CHW, pregnant women who were not reminded the day of ANC appointment, lack of knowledge on the role of doing ANC, thinking that one or 3 visits was enough and mothers who delivered before the last ANC appointment were factors significantly associated with not achieving 4 standard ANC visits.

Keywords: Antenatal Care, Visits, Delivery, Factors, Anc Study, Complete Standard ANC

Introduction

Antenatal care (ANC) is the care provided by skilled health care professionals to women throughout their pregnancy. It includes risk identification and screening, prevention and management of pregnancy-related or concurrent diseases, and health education and promotion [1]. Globally, maternal deaths have been reduced to 44% since being included in Millennium Development Goals (MDGs) in 1990. However, low-income countries still have a big proportion of the global burden of maternal health problems. Sub-Saharan Africa alone reports 66.3% of world maternal deaths in 2015 and 12 countries of the region still count more than 500 deaths per 100,000 live-births compared to less than 5 deaths per 100,000 live-births in ten countries with the lowest maternal mortality rate [2].

ANC is considered as one of the safe motherhood interventions [3]. It consists of routine check-up service for mostly healthy pregnant women in order to identify signs and risks of disease and provide early response [4]. At the beginning of 1900's, ANC was introduced in high income countries, and later spread to other countries without strong proof of evidence on its effectiveness with regard to content, number and timing of visits [5]. However, during the last few decades, there has been a growing interest in documenting the effectiveness of ANC especially in low-income countries [2].

Antenatal Care (ANC) service for pregnant women by trained health professionals improve maternal and newborn health outcomes. It is one of the most significant means taken by the state to reduce deaths in mother and fetus. Therefore, these women must attend prenatal care visits. At ANC visit, a pregnant mother receives tetanus vaccine, deworming tablets, iron and folic acid supplements. In addition to providing counseling and facilitating it for childbirth and emergency [1]. Therefore, the World Health Organization recommends that women who do not suffer from complicated matters in pregnancy to make Antenatal care visits not later than the third month, at the sixth, at the eighth, and at the ninth months [6]. It is also recommended to increase these visits in case of problems during pregnancy. The number of visits varies for countries, as it increases in countries with a high income rate, as in Norway, where it is recommended to increase the number of visits to eight visits, starting from the fortieth week [6].

In 2003, WHO recommended that the number of ANC visits in developing countries should be four, but in 2016 it raised that number to 8 visits to raise the health awareness of pregnant women and provide consultations and solutions to the corresponding health and psychological problems [7]. Studies have proven that one of the most important factors that reduce the rates of those visits is the low level of education of the mother, ethnicity, and low standard of living [8]. It has been noticed that those women who have

decreased their visits have been exposed to a number of problems such as low fetal weight and premature labor [8].

Rwanda has followed the 2001 WHO model of 4 focused ANC visits for pregnant women without past and current complications [9]. The country has made enormous progress in maternal and child health, and is considered among the few countries that have achieved the 5th maternal health-related MDGs, although maternal mortality ratio is still high at 203 deaths per 100,000 live-births [10]. Improved access and coverage of Antenatal Care have almost certainly played an important role in improving maternal and newborn health in Rwanda. A total of 98% of women attend at least one ANC visit. However, only 47% complete 4 ANC standard visits and 56% of women go for their 1st visit before the 4th month of pregnancy [10]. In November 2016, WHO published a new Antenatal Care guideline that recommends 8 visits or contacts with a trained health professional during pregnancy [11].

The national guideline for ANC in Rwanda are based on the 2001 WHO model of 4 focused Antenatal Care visits for normal pregnancies. Standard ANC visits are provided at health center level. District hospitals are concerned with gynecological consultations for women with diagnosed complications and referrals from health centers. Rwanda Demographic and Health Survey have consistently shown that there are no major geographical differences in key reproductive health indicators apart from rural-urban patterns [12-14].

Although, Rwanda has followed the previous WHO model of ANC which recommends one visit during each trimester of gestation and a final visit immediately preceding delivery for women without pregnancy-related complications or risk factors, still only a few proportion of pregnant women make all 4 recommended visits during pregnancy [15]. The 2019-2020 RDHS results showed that practically all of Rwandan women (98%) who gave birth in the 5 years preceding the survey received ANC from a trained health professional at least once for their last birth. Only 47% of women had 4 or more ANC visits [10]. At Musanze health center, 178 pregnant women have attended ANC visit at the first time. Of them 67 started their ANC before 12 weeks of pregnancy (1st ANC standard visit) from January 2021 to December 2021, only 29 (43.2%) have completed their 4th ANC standard visit [16].

Materials and Methods

Study Design and Period

The cross-sectional study design was employed to assess factors associated with discontinuing four antenatal care standard visits. The study was conducted in December 2021.

Population

The source population were all pregnant women who attended Antenatal Care (ANC) service at Musanze health center while the study population were purposively selected pregnant women who attended ANC service in the 1st trimester of pregnancy at Musanze health center and was supposed to complete the 4th ANC standard visit from January 2021 to December 2021.

Inclusion and Exclusion Criteria

Pregnant women who attended ANC in the 1st trimester of pregnancy (less the 3 months of gestational age) and who were expected to complete the 4th ANC standard visit from January 2021 to December 2021, were enrolled in the study. Pregnant women who completed 4 ANC standard visits and those who did not complete 4 ANC standard visits but who were supposed to complete the 4th ANC standard visits from January 2021 to December 2021 were recruited to participate in the study. Pregnant women who visited ANC service having more 3 months of gestational age and pregnant women who were not supposed to complete 4 ANC standard visits from January 2021 to December 2021, were excluded in the study.

Sampling Methods

Nurses working at Musanze health center and pregnant women who completed 4 ANC standard visits from January 2021 to December 2021 and those who were supposed to complete 4 ANC standard visits from January 2021 to December 2021 but who have failed to attend the 4th ANC service in the study period, were enrolled in the study. The study respondents were recruited by using a purposive sampling technique. Pregnant women who met the study criteria during the study period were recruited in the study.

Sample Size

The study enrolled all nurses working at Musanze health center and all pregnant women who completed 4 ANC standard visits from January 2021 to December 2021 and pregnant women who were supposed to complete 4 ANC standard visits from January 2021 to December 2021 but have failed to attend the 4th ANC visit in the study period. Data were collected on 67 pregnant women and 8 nurses of Musanze health center. The significant level of 0.05, with 95% confidence interval (CI), a maximum acceptable marginal error of 5%, and a non-response rate of 10% was used to obtain credible results.

Study Tools

Data were collected using a standardized and pretested questionnaire by using an interview-administered questionnaire. Data collection tools were prepared in English language and then translated to Kinyarwanda language. Data were collected by researchers themselves. Questionnaires were distributed to pregnant women at their home. Nurses were given questionnaire in pause time. ANC register was used to identify the names and the residence identification of women fulfilling the study enrollment criteria. Study data collectors wrote a list of women who fulfilled the study criteria and was used to reach all study participants. Arriving at home of

the study participant, client card was reviewed to verify important information regarding the study enrollment criteria. The enrolled mothers were physically reached with help of a community health worker. The pregnant mothers who were missed at their home were given an appointment to return back when they will be available.

Variable and measurements

Dependent Variable

Discontinuing four Antenatal Care (ANC) standard visits

Independent Variables

The number of ANC visits

One visit, two visits, three visits and four visits

Visit of a community health worker to the pregnant women

The community health worker (CHW) is expected to visit every pregnant women in her village to deliver message related to the health of a pregnant women including nutrition, the well being of the pregnant woman and birth preparation activities. The CHW is expected to visit the pregnant mother once in every trimester of pregnancy or more; at minimum 3 visits during the pregnancy period of 9 months.

Community health worker to remind the pregnant mother to attend the next ANC appointment

When the pregnant woman is registered in rapid SMS system, the community health worker gets and SMS on her telephone indicating the mother to remind that the date of the next ANC appointment is arriving. It is from this information that, CHW visit the pregnant woman to remind her about the next ANC appointment.

Reason of not completing 4 ANC standard visits

Forgot the next appointment, busy in daily activities, deliver before the last appointment and lack of knowledge on the role of each visit.

Perception of health providers on the reason of discontinuing 4 standard ANC visits

Poor design of ANC visit appointment, CHW do not visit mothers to remind them to attend the next appointment, mothers who lie the date of the last amenorrhea, not use gravidometer when estimating the gestational age and lack of information on the role of ANC visits.

Data Analysis

Data were entered in SPSS statistical software version 25 for analysis. The descriptive statistics of numerical variables were presented using frequency with percentage and displayed in tables. Binary logistics regression analysis was used to evaluate the association between dependent and independent variables and to identify variables for multivariable analysis with p-value <0.05 in order to predict the association of explanatory variables. The multivariable logistic regression model was applied by the backward elimination

stepwise method. The crude and Adjusted Odds Ratio (COR and AOR) results together with their corresponding 95% confidence interval with computed p-value <0.05 were considered to declare predictive candidate variables.

Ethical Considerations

Ethical clearance was obtained from the institutional ethical approval committee of Nkumba University. A formal letter from the directorate of the school of Postgraduate studies and research was written to Musanze health center and then the permission and support letter to conduct the study was provided. Written consent was obtained from each study participant after explaining the purpose of the study before questionnaire distribution. Respondent's name was not written on questionnaire for anonymity and confidentiality of information. The study participants were informed that they are free to withdraw from the study from any time. The study was conducted in accordance with the declaration of Helsinki.

Results

Age of the interviewed women

The results show that age has a significant impact on four antenatal care completion. Despite the fact that a pregnant woman went to Antenatal Care (ANC) in the first trimester of pregnancy, the more your age gets old (43%), the more chance you will not complete four antenatal care (Table 1).

Table 1: Age Distribution of Pregnant Women

Age, 5 year groups	Frequency	Percentage
15-19	2	3%
20-24	7	11%
25-29	13	19%
30-34	16	24%
35-39	29	43%
40-44	0	0%
45-49	0	0%

The Number of Antenatal Care Visits Attended By the Study Participants

The table 2 shows that almost mothers did at least two antenatal care (ANC) visits. Of the total, 51% did two visits and 40% did three visits. The number of ANC visits attended could be associated with the number of visits of a Community Health Worker (CHW) aiming to deliver the message related to ANC profits for a pregnant woman. The study shows that 27% of respondents declared that they have been visited by a CHW one or two times whereas 54% responded that they have been visited by a CHW three or more times.

Table 2: Frequency of Antenatal Care Visit

Total antenatal care visit done by a mother	Frequency	Percentage
1 visit	6	9%
2 visits	34	51%
3 visits	27	40%
How many times have you been visited by a CHW		
Any visit	13	19%
Less or equal to 2 visits	18	27%
3 or more	36	54%

The Reasons of Discontinuing 4 Antenatal Care Standard Visits

The study showed that 36% of the respondents thought that 2 or 3 Antenatal Care (ANC) visits are enough for a pregnant mother against 6% and 21% who forgot to attend the next ANC appointment and delivered before the last ANC appointment respectively. Among the respondents, 57% said that they have been reminded by a CHW to attend the next ANC visit appointment (Table.3).

Table 3: Reasons of Not Achieving 4 Antenatal Care Standard Visits

Reasons of not completing 4 antenatal care visits	Frequency	Percentage
I forgotten the next appointment	4	6%
I thought 2 or 3 visits are enough	24	36%
I was busy at the day of ANC appointment	8	12%
I delivered before the last ANC appointment	14	21%
Have you been reminded by a CHW to attend the next ANC visit appointment	Frequency	Percentage
Yes	38	57%
No	29	43%

The study shows that 42% of respondents were interested to know if they are pregnant when they visited ANC service at the first time whereas 13% said that they went in ANC service because they feared the punishment imposed to the mother who visit ANC ser-

vice after 3 months of pregnancy. 17% of respondents answered that they attended ANC in the 1st trimester of pregnancy because they were motivated by their husbands to attend ANC early in the first trimester of pregnancy (Figure.1).

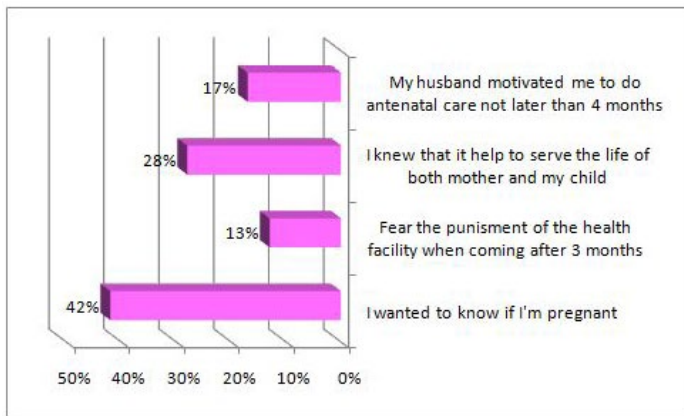


Figure 1: Suggested reasons for attending antenatal care service before 3 months of pregnancy

The study revealed that 37% of nurses responded that the cause of discontinuing four ANC is due to the mothers who lie ANC service provider on the gestational age, 13% suggested that the issue of not achieving 4 standard ANC visits is due to the poor design of ANC visit appointment, lack of knowledge on the role of four ANC standard visits and CHWs who do not remind mothers to attend the next ANC visit appointments (Figure.2).

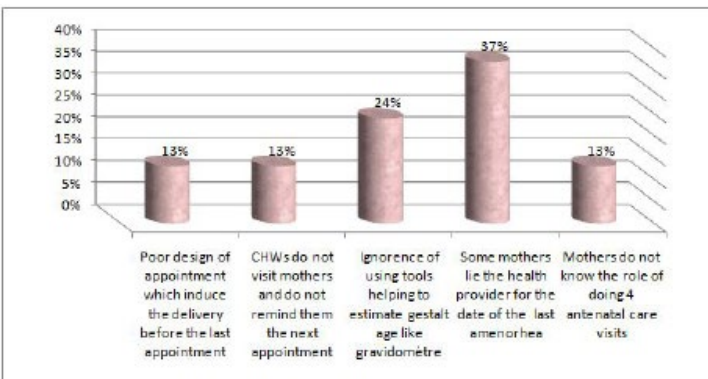


Figure 2: Perception of health providers on the reasons of not achieving 4 ANC standard visits

Factors Associated With Discontinuing Four Standard Antenatal Care Standard Visits

The multivariable analysis of this study showed seven factors associated with discontinuing four standard Antenatal Care (ANC) visits. The respondents who were not visited by a Community Health Worker (CHW) were 2.6 times more likely to not complete four standard ANC visits as compare with counterparts (AOR, 2.6;95% CI: 1.4, 4.7). The variable of being visited by CHW was statistically significant variable associated with discontinuing 4 standard ANC visits (AOR=2.6,95% CI, 1. 4,4.7, p<0.001) for respondents who were not visited and (OAR=1.9, 95% CI,1.12, 3.33, p<0.002) for respondents who reported to be visited one or two times. The variable outlining the reasons of not completing four ANC standard visits reported two factors which are strongly associated with discontinuing 4 ANC standard visits. Those include the respondents who reported the lack of knowledge on the role of attending ANC service (OAR=1.9, 95% CI, 1.1, 3.1, p<0.001) and the respondents who thought that doing one or two visits are enough (AOR=1.2, 95% CI, 0.7, 1.6, p<0.001). Also delivery before the last ANC appointment (AOR=0.1, 95% CI,0.02, 0.48, p<0.002) and thinking that two or three visits are enough (AOR=0.6, 95% CI, 0.3, 0.8, p<0.003) were found as factors significantly associated with discontinuing four ANC standard visits. In this study, the variable of reminding the pregnant women to attend the next ANC appointment was 4.4 times more likely to be a factor associated with discontinuing 4 ANC standard visits (AOR=4.4, 95% CI, 1.1, 17.2, p<0.001) (Table 4)

Table 4: Factors associated with discontinuing four Antenatal Care standard visits in Musanze health center in 2021 (N=67)

Variables		Discontinuing 4 ANC standard visits		COR[95% CI]	AOR [95% CI]	p-Value
		Yes	No			
Pregnant women visited by CHW	Visited ≥ 3 times	54	13	1		
	Visited ≤2 times	49	18	2.3(2.0, 2.6)*	1.9(1.12, 3.33)**	0.002
	Not visited	31	36	2.4(2.1, 2.7)*	2.6(1.4, 4.7)**	0.001

Reason of not completing 4 standard ANC visits	Forgotten appointment	63	4	1	1	
	Think 1 or 2 visits are enough	17	50	1.4(1.2, 1.5)*	1.2(0.7, 1.6)**	0.001
	Think 2 or 3 visits are enough	43	24	0.39(0.33, 0.34)*	0.6(0.3, 0.8)**	0.003
	Busy at the day of appointment	59	8	0.52(0.47, 0.56)*	0.7(0.4, 1.1)	
	Delivered before the last appointment	53	14	0.39(0.27, 0.53)*	0.1(0.02, 0.48)**	0.002
	Lack of knowledge on the role of ANC	11	56	2.2(1.8, 2.9)*	1.9(1.1, 3.1)**	0.001
Have been reminded by CHW to attend ANC appointment	Yes	38	29	1	1	
	No	16	51	10(7.1, 14.0)*	4.4(1.1, 17.2)**	0.001

Key -*=Statistically significant at binary regression, 1=Reference group, CI= Confidence Interval, COR= Crude Odds Ratio, AOR= Adjusted Odds Ratio, CHW=Community Health Worker, ANC= Antenatal Care

Discussion

Using the opinion of service providers to find out the reasons for the reluctance of women to complete the fourth Antenatal Care (ANC) standard visits, it was found that 37% of health providers responded that the cause of discontinuing four ANC standard visits is due to the mothers who lie ANC service provider on the gestational age and 13% suggested that the issue is due to poor design of ANC appointment, lack of knowledge on the role of four ANC standard visits and CHWs who do not remind mothers to attend the next ANC appointments [17].

The study found that one of the biggest reasons of women's reluctance to complete 4 ANC standard visits is due to ignorance on the role of these visits. This is explained by some of them who responded that they believe that one or two ANC visits are sufficient, and others who need to be reminded on the date of ANC visit appointment because they are busy with other work and responsibilities. Studied showed that the husband should play an important role in motivating and reminding the wife to attend different ANC visits appointment in this study, it was shown that it is necessary to raise awareness of pregnant women on the role of doing 4 ANC standard visits to the health of the mother and of the fetus [18]. The awareness on the health benefits of 4 standard ANC should be created on the husband not only for the wife. It is the role of health providers and health professional in community to mobilize the population on the importance of attending 4 standard ANC visits [19].

From this study, 36% of the respondents thought that 2 or 3 visits are enough for a pregnant mother, 6% answered that they forgot to attend the next ANC visit appointment and 21% said that they gave birth before the last ANC visit appointment. Among the respondents, 57% confirmed that they have been reminded by a CHW to attend the next ANC visit appointment. These results are similar to Frumence's study which shown that several cultural factors including religion might negatively affect the early attendance of ANC visit and identification of pregnant women by community health workers in the community [20].

Regarding the reasons which pushed the pregnant women to attend ANC visit in the first trimester of pregnancy, 42% of the respondents reported that they wanted to know if they are pregnant, 13% attended early because they feared the punishment imposed to a pregnant women who attend ANC service at the first time having the pregnancy of more than three months and 17% of respondents declared that they attended ANC early because they were motivated by their husband to attend ANC not later than 3 months of pregnancy. This finding is agreed with Warri and George's study which shown that pregnant women lack information on the purpose of early attending ANC. In their study Warri and George said that health facility barriers as well as socio-cultural beliefs have significant influences on the timing of antenatal care initiation [21].

On the level of the number of ANC visits attended by respondents, 51% of the respondents said that they attended two ANC visits and 40% reported that they attended three ANC visits. This study showed that the number of ANC visits attended by respondents were increased for the pregnant women who were reminded by Community Health Worker (CHW) to attend the next ANC visit. Therefore, the reminder message of the CHW have a great effect in increasing the number of ANC visits attendance for the pregnant women. This study results is similar to findings of the study conducted by Javanparast et al (2018) which indicated that CHWs have a role in improving the level of access of health services [22].

Regarding the factors associated with discontinuing 4 standard ANC visits, it was shown that the number of Community Health Worker (CHW) visits negative affect the achievement of 4 ANC standard visits.

The factor of not have been visited by CHW any time was significantly associated with arriving to the 4th ANC standard visits $p < 0.001$. The factor of being visited by a CHW less than two times was found to be associated with low level of the 4th ANC standard visit attendance $p < 0.002$ whereas the pregnant women who were visited regularly (3 or more times) have shown a posi-

tive association for achieving four ANC standard visits.

In this study, the factor of thinking that one or two ANC visits $p < 0.001$ and the factor of lacking the knowledge $p < 0.001$ have been found to be associated with discontinuing four ANC standard visits. Also delivery before the date of the next ANC visit appointment $p < 0.002$ and pregnant women who thought that doing two or three ANC visits $p < 0.003$ were approved to be factors associated with negative impact on completing 4 standard ANC visits. However, the factor of being busy at the day of ANC visit was not associated with low level of attendance of the 4th ANC standard visits. According to this findings, reminding pregnant women to attend the next ANC visit appointment was a factor statistically associated with discontinuing 4 ANC standard visits $p < 0.001$.

Conclusion

In this study, health providers responded that the problem of not achieving 4 standard Antenatal care (ANC) visits is due to mothers who lie the date of last amenorrhea (37%), poor design of the next ANC appointment (13%), lack of knowledge on the role of doing 4 standard ANC (13%) and Community Health Workers (CHW) who do not remind pregnant mothers the day of ANC appointment (13%). Modifiable factors like pregnant mothers who do not be visited by CHW, pregnant women who do not be reminded the day of ANC visit appointment, the lack of knowledge on the role of doing ANC, thinking that one or 3 visits are enough and mothers who deliver before the last ANC appointment were factors significantly associated with not achieving 4 standard ANC visits.

Limitations

As this study used quantitative data collection method, it lacks the depth to identify the reasons behind associated factors for not attending 4 Antenatal care standard visits.

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