East African Medical Journal Vol. 93 No. 2 February 2016
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ABSTRACT

***Background*: Non-compliance with at least four standard antenatal care (ANC) visits is a critical public health problem. In Rwanda, the proportion of pregnant women who follow the four ANC remains relatively low (43.9%) although it has relatively increased.**
***Objectives*: To assess the level of knowledge of selected pregnant women on the importance of using the ANC service, to determine the proportion of pregnant women attending the four ANC and to identify factors limiting the women to the four standards ANC compliance.**
***Design*: A descriptive, cross-sectional, quantitative study.**
***Setting*: Nyaruguru District.**
***Subject*: All women on term and those with child aged one year. They were randomly selected from each village until the sample size of the study (n = 367) was attained.**
***Results*: About 13.4% of pregnant women made at least four ANC visits. The low ANC attendance was significantly associated with the long walking distance from home to the health centre (p=0.05), insufficient knowledge on the importance of the use of the ANC service (p=0.01).**
***Conclusion*: There is a need to strengthen education and awareness on the importance of ANC in that community in order to reduce maternal and infant mortality in Nyaruguru District.**

INTRODUCTION

Antenatal care (ANC) is a medical process of monitoring and giving care to the pregnant woman and her future child in a health facility by trained personnel. ANC consist of all kinds of care provided to pregnant women at the primary health care services, from screening to intensive care from the beginning of pregnancy to birth (1). ANC entails all the essential activities of surveillance of pregnant women by screening for conditions and diseases that the mother suffered (2,3), recognition and management of pregnancy-related complications (4), advice and support to the woman and her family for preventive measures of different pathologies to improve health of the pregnant woman and her future child (5,6).

In 2013, the world Health Organisation (WHO) and other global Non-governmental organisations declared that worldwide around 800 women die from preventable complications related to pregnancy or child birth every day and about 99% of these deaths occur in developing countries. In Rwanda, the maternal mortality ratio varied from 1071per hundred thousand live births in 2000, 750 in 2005, 476 in 2010 and 210 in 2015 (7, 8). In developed countries, almost all pregnant women obtain antenatal care, which is different from developing countries (9,10). According to Sepou (11),regular visits for antenatal consultation have contributed to the reduction of maternal and infant mortality in developed countries. All pregnant women in developed countries respect the four standard antenatal visits (7).

In Africa, 2/3 of pregnant women make at least one antenatal visit during the pregnancy period. More so, in sub- Saharan Africa, the majority of women under-utilise ANC services. Usually they come late for the services and make fewer than recommended number of ANC visits (11). In Rwanda, the majority (98%) of pregnant women attend the antenatal care at least once. However, the proportion of those who complete the four standard antenatal care visits is still relatively low at (43.9%) although the number

is increasing (8, 12).

The Government of Rwandan through the Ministry of Health invested in raising awareness and concentrated efforts to the adherence and utilisation of community health insurance. This showed an improvement in the utilisation of ANC services at national level. However, still the proportion of pregnant women who attend at least one or all the four standards antenatal care visits remains much lower (13).The specific objectives of this study therefore, were to assess the level of knowledge of women about the importance of using the antenatal care service during pregnancy, to determine the proportion of women of Nyaruguru District that attend at least one or all the four standard antenatal visits during pregnancy, and to identify the factors associated with the non-compliance with the four standards antenatal care among the pregnant women in Nyaruguru District.

MATERIALS AND METHODS

Study design and study area: The study was cross-sectional, descriptive, and quantitative. The study was carried out among pregnant women in Nyaruguru District, Southern province. The district is constituted of 14 sectors and 332 villages. It has a surface area of 2.750 km^2 with a population of 252.695 people of which 52.9% are women. There are ten health centres covering the 14 sectors.

Population, sample and sampling method: The population of this study consisted of pregnant women residing in Nyaruguru District. The sample size of 367 women was computed using the formula of Gregg (14) as follows: $n= z^2 (p.q)/d2$,wheren is sample size, z = 1.96 is a measure of number of standard deviations from the sample mean,p is proportion (0.35) of pregnant women who respect the four antenatal visits at national level as was reported in 2010 (12), dismargin of error (5%). A 5% increase was added to compensate for the voluntary refusal to participate.

Data collection instrument: To achieve the specific objectives of this study, a questionnaire was used with close ended questions. The questionnaire was constructed based on the literature review to suit the objectives of the study. The questionnaire was then reviewed by a gynecologist and two professional midwives.

The level of knowledge of the participants about the importance of the utilisation of ANC during pregnancy was assessed using the following items: the provision of health care for the mother and child, to ensure the good process of pregnancy, to detect problems and complications that may prevent the good process of pregnancy and provide support, provide advice to improve the general health of the mothers, children and all the household, provide advice on family planning, infant feeding, and breast feeding. The answer to at least three elements was considered as "adequate knowledge". The proportion of pregnant women who attended the four recommended antenatal care visits from the first trimester (at 1-3months) of pregnancy, second trimester (at 4-6months), third trimester (at 7-9months) and the last visit in the nineth month of pregnancy was recorded.The factors contributing to the non-compliance with four standards antenatal care were determined by finding out the relationship between the dependent variable (compliance with four antenatal visits) and the independent variables namely: age, level of education, marital status, distance of residence and the Health Centre, the waiting time, the relationship between pregnant women and health care providers.

Methods of data collection: In this study the villages or clusters were numbered in the list and maps obtained from the census bureau. These maps included the locations of the head of ten-household communities, thus showing approximate population distribution. The selected clusters were visited two to three days before the survey and the village leaders were asked to update the map. One of the clusters was chosen at random by drawing lots and all households were included sequentially in the sample.

The fieldwork was carried out by the survey team comprised of two registered nurses supervised by the principal investigator. The team conducted household door-to-door survey in the clusters assisted by village guides or community health workers. The purpose of the study and the methods of data collection were explained to the subjects and written consent was obtained before the survey.

The inclusion criteria for this study comprised of women whose last born baby was less than one year old and women of nine months of pregnancy. The choice of women in this community to participate in the study was done following the inclusion criteria until obtaining the desired sample size of the study (367 participants). The selected participants who consented to participate in the study were asked questions by a research team member while another one was filling the responses provided by the participant. If an eligible person was absent, the survey team returned to the household to examine her before leaving the area.

Data analysis: Data entry and statistical analysis were performed using the Statistical Package for Social Science(SPSS) software, version 16.0. Descriptive statistics were used to obtain the frequencies, percentages, means and standard deviations. The Chi Square test was used in order to determine a statistical relationship between variables.

Ethical considerations: Ethical clearance was obtained from the Health Ethics Committee of the "Université International Senghord' Alexandrie" in Egypt. Participants were explained about the purpose of the study. Responses were confidential, and subjects' participation was voluntary and had the right to withdraw without any explanation and impact. Each participant was asked to sign the consent form before answering the questionnaire. Permission to conduct the study was sought from Nyaruguru district

RESULTS

All the participants (100%) agreed to participate in the study and responded to all the questions.

Demographic characteristics: The majority of the women interviewed were aged between 19-24 years of age representing 26.1% of the total sample followed by the 25-30 years representing 24.3%. More than three quarters (78.5%) of the women did not haveformal schooling while 18.5 % had attended primary school but did not complete it. Only 2.7 % of participants completed primary education and only one participant (0.3%) attended secondary education. Most participants were married and accounted for 75% while 13.1 % were single mothers, 6.5% separated from their husbands and widows represented 5.7%. A great proportion (91%) of the participants reported that they were enrolled in the community medical insurance. The majority of the participants used more than an hour walking to the nearest health centre and represented 62.7%, while 37.3% of participants used less than one hour to reach the nearest health centre. The majority (71.7%) of the participants reported that they spent thirty minutes or more waiting in the queue before being received at the prenatal consultation. Almost all the participants, 97.3 % were satisfied with the reception they received from the health personnel.

Use of antenatal care services: Almost all women who participated in this study (97.3%) hadused the antenatal care, while 2.7% did not use the service. The results of this study shows that a small percentage (13.7%) of women complied with the four standards antenatal care visits during pregnancy compared to those who visited the services three times (16.5%) or twice (20.2%). Table 1 indicates that more than half (49.6%) of the women reported that they visited the ANC services once during the pregnancy.

Level of knowledge on the importance of the ANC services: The results of this study indicate that 67.0% of the women had sufficient knowledge on the importance of using the ANC services. Figure 1 shows the details of how the participants responded to the questions: those who responded to only one question (20.2%) were classified to as having low level of knowledge and those responded correctly to two questions (12.8%) were classified as having medium level of knowledge.

Factors related to the non-compliance of the use of ANC services: As displayed in Table 2, among the participants who use less than an hour to reach the nearest Health Centre, 8.5% completed four standards ANC and among those who use an hour and more, 4.9% completed four standards ANC. There is a statistically significant negative association between the distance to health facility and completion of the four ANC visits (p =0.044).The increasing distance resulted in non-completion of the four ANC visits.

For participants who had sufficient knowledge, 8.8% completed four standards ANC and those who had medium and low knowledge, 4.6% completed four standards ANC. There is a statistically significant association between sufficient knowledge and completion of the four ANC visits (p =0.012), with utilisation decreasing with decreasing knowledge. Thus non-compliance with the four standard ANC visits can be explained in terms of living far from health facility and having limited knowledge about importance of ANC visits during pregnancy.

Table 1

Proportion of pregnant women who used the antenatal care services (n=367)

Variable	Frequency	Percentage
Utilisation of ANC (n=367)		
Yes	357	97.3
No	10	2.7
Number of ANC visit done (N=357)		
One visit	177	49.6
Two visits	72	20.2
Three visits	59	16.5
Four visits	49	13.7

Figure 1
Level of knowledge of the respondents on the importance of using the ANC (N=357)

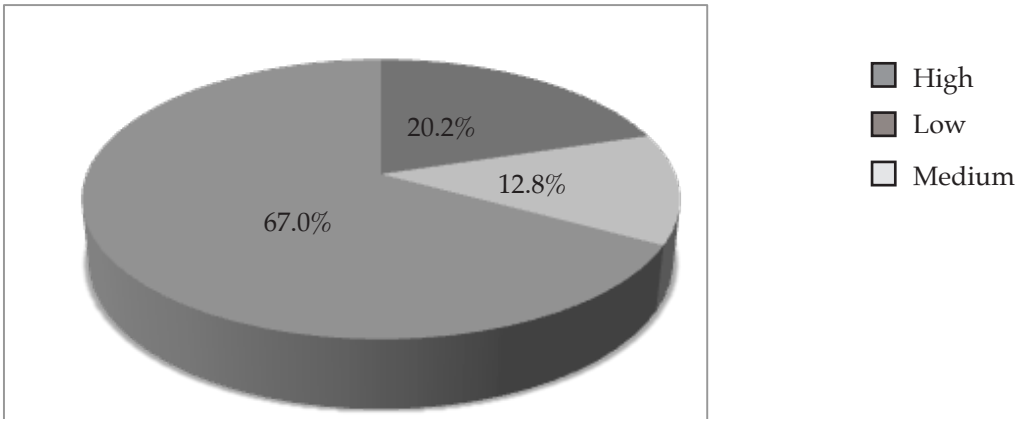

Table 2
Factors related to the use of the four antenatal visits by the pregnant women (n=367)

Variable	Frequency	Completed the four recommended antenatal visits	Less than four recommended antenatal visits	X^2	p value
Age(Years)					
< 31	263	36 (9.8)	277 (61.8)		
≥ 31	104	13 (3.6)	91 (24.8)	0.091	0.455
Level of Education					
Did not attend the school	356	48 (13.1)	308 (83.9)		
Secondary School attended	11	1 (0.3)	10 (2.7)	0.178	0.555
Marital status					
Married	189	31 (8.4)	158 (43.6)		
Others	178	18 (5.0)	160 (43)	3.030	0.049*
Distance from home to the Health Centre					
< 1 hour walk	187	31 (8.5)	156 (42.5)		
≥ 1 hour walk	180	18 (4.9)	162 (44.1)	3.340	0.044*
Waiting time					
< 30 minutes	94	15 (4.1)	79 (21.5)		
≥ 30 minutes	273	34 (9.3)	239 (65.1)	1.144	0.410
Relationship with the health personnel					
Good	357	49 (13.4)	308 (83.9)		
Not good	10	0 (0)	10 (2.7)	1.584	0.234
Level of Knowledge					
Medium and Low	121	17 (4.6)	104 (28.3)		
High	246	32 (8.8)	214 (58.3)	5.864	0.012*

*p<0.05

Note: "Not good" means thatparticipants were not happy the way they are received by Health personnel. They felt being ignored at the health centers.

DISCUSSION

The results of this study indicate the proportion of women who completed the four standards antenatal care is low. They only represent 13.4% of all pregnant women who participated in the study. These results remain low compared to the study done in South Sudan among women who had given birth where only 18% completed the four recommended antenatal care visits (15). This rate is also low compared to the results of the Rwanda Demographic and Health Survey indicating that the national average for pregnant women who completed the four standards antenatal care visits was 43.9% (8).Some of the factors that were found to be significantly related to the visits of the antenatal care services were the distance that women had to travel from home to the health centers. The results of this study indicate that women who used less than an hour to walk to the health centre attended more frequently the four antenatal visits compared to those who walked for more than an hour. These results are similar to the study done in Ethiopia (16) and Ghana (17) where the distance of the place of residence of the pregnant women and the health centre plays a big part on the attendance or compliance with the four standards antenatal care. Yesuf and Calderon-Margalit(18) also agreed by stating that the geographic accessibility of the health centreinfluences the utilisation of antenatal care service. The barriers that women faced in accessing the health care in rural area in Ethiopia could be the similar to the ones encountered by the participants of this study in Rwanda. They include the long distance to the health facility, taking transport which is sometimes impossible due to poor nature of road infrastructure and financial constraints.

This study further indicated that the majority of the women seemed to have a high level of knowledge as to the importance of the use of antenatal care services. The knowledge of women who participated in this study was rated as good probably due to the initiative of the Government of Rwanda in which the Community Health Workers provide health education and support in general and prenatal care in particular (19). This study found that women know the importance of antenatal case services like the decrease the mortality of mothers and children, family planning, reduction of the HIV / AIDS mother to children transmission. It was further noted that having the sufficient knowledge significantly influenced their number of visits to the antenatal care. The results of this study concur with the study conducted in southern Tanzania, where 68% of participants with sufficient knowledge had done four standard antenatal care visits and were assisted by skilled health personnel during delivery (19).

During the first trimester it was reported in Senegal that women would tend to hide their pregnancy with the belief that its exposure could bring misfortune to the foetus, particularly in polygamous families (20). Unmarried women, single mothers or women with unwanted pregnancy have also been shown to hide their pregnancies because of fear or shame in the eyes of others (21,22)resulting in non-attendance of ANC.

The findings of this study indicated that a small proportion (13.4%) of the pregnant women respected the four standards ANC visits during pregnancy. The non-compliance to four ANC visits was mainly related to long distance between the place of residence to the Health Centres and the insufficient knowledge on the importance of ANC serviceIt is recommended to increase the number of health centres in Nyaruguru district in order to reduce the distance walked going for ANC.

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