Factors Associated with the Timing of the First Antenatal Visit among Pregnant Mothers Attending Antenatal Care at Kampala International University Teaching Hospital, Western Uganda

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ABSTRACT

Every year, around the world, maternal deaths contribute to more than half a million deaths, and of these, 99% occur in developing countries, and 286,000 are the result of complications that can be avoided through fitting antenatal care in terms of early antenatal care booking and follow-up visits as often as possible. Antenatal care (ANC) is a key preventive wellbeing benefit utilised in developed nations and around the world by providing hopeful mothers with regular health evaluations and information about the course of pregnancy, labour, birth, and parenthood. This care ought to begin from the start of pregnancy and end at delivery. This study aimed at determining the timing of the first antenatal visit, associated factors, and proportion of pregnant women who make their first antenatal visit with the recommended time among pregnant mothers attending antenatal care at Kampala International University Teaching Hospital, Bushenyi. This was a hospital-based, cross-sectional observational and analytic study. We recruited 220 randomly selected participants from the antenatal clinic to participate in the study. Univariate analysis, bivariate analysis, and multivariate logistic regression were done using STATA version 14.0 to identify factors associated with the timing of the first antenatal visit. Odds ratios with a 95% confidence interval were computed to determine the level of significance at bivariate analysis, whereas adjusted odds ratios were calculated at multivariate analysis to establish independent significant factors. The mean age of the study participants was 27 years, with a standard deviation of 6 years from the mean. The minimum age was 16 years, while the maximum age was 41 years. The mean timing of the first antenatal visit was 18 weeks. Participants who made the first ANC visit within the recommended time were 31.36% (69/220), while 68.64% (151/220) were late. Age, marital status, education level, gravidity, planned pregnancy good attitude towards ANC, perceived attitude of health workers, and waiting time were independently associated with the timing of the first antenatal visit among the study participants. The study revealed that the majority of pregnant women who visited the clinic began antenatal care later than the WHO-recommended period of within three months of pregnancy. The main reasons cited for the late start of ANC call for raising awareness of the best period to start ANC and the importance of starting ANC early.

Keywords: Antenatal care, Pregnant mothers, Western Uganda, Developing countries

INTRODUCTION

The antenatal care (ANC) provision, or regular check-ups during pregnancy, through the public health services in modern obstetrics was started in the late 1930s in the United Kingdom and Northern Ireland. Soon after, a formal labour and delivery care policy was introduced as an integral part of maternity care [1]. Antenatal care (ANC) is the care a woman receives throughout pregnancy in order to ensure that both the mother and child remain healthy. A healthy diet and lifestyle during pregnancy are important for the development of a healthy baby and may have long-term beneficial effects on the health of the child [2–4]. Early antenatal care attendance during the first three months of gestation plays a major role in detecting and treating some complications of pregnancy and forms a good basis for appropriate management during delivery and after childbirth. Failure to attend antenatal care early results in the potential for complications during pregnancy, delivery, and puerperium [5, 6]. Antenatal care (ANC) provides a stand for central healthcare tasks, including health promotion, screening and diagnosis, and disease prevention. It remains a vital health care tool to reduce the risk of stillbirth, preterm labour, and pregnancy complications [7, 8]. The World Health Organisation (WHO) recommended a new model for antenatal care that separates pregnant women into two groups: those who are likely to need only routine antenatal care, which constitutes about 75% of pregnant women, and those with specific health conditions or risk factors who need special care and constitute about 25% of pregnant women [9]. It can be noted that the model recommends

that both groups of women come as early as possible, before the sixteenth week of gestation. Early initiation of ANC visits enables health care providers to diagnose early pregnancy-related complications and institute timely and appropriate interventions [8, 10]. Every year, around the world, maternal deaths contribute to more than half a million deaths, of which 99% occur in developing countries and 286,000 are the result of complications that can be avoided through fitting antenatal care in terms of early antenatal care booking and follow-up visits as often as possible [11]. Globally, progress has been made in terms of increasing access and use of antenatal care, although the proportion of women who are obtaining the recommended minimum of 10 of four visits is too low. Furthermore, women often make their first consultation late in pregnancy, despite the fact that early antenatal care initiation yields maximum benefits. In the Philippines, according to the 2013 national demographic and health survey (NDHS), more than 80% of women visited ANC at least four times during their pregnancy periods. However, roughly 40% of pregnant women visited the first ANC after four months of their gestation periods [12]. Research recommends that in low-income nations, especially in Africa, pregnant women frequently don't get the suggested ANC. Across sub-Saharan Africa, there's wide variation in ANC participation: in spite of the fact that 71% of pregnant women attend formal ANC at least once, only 44% attend ANC four or more times [13]. Thus, a woman in Africa may face a lifetime risk of death during pregnancy and childbirth as high as one in 26, compared with only one in 7300 in developed regions [14]. To guarantee that women accomplish four ANC visits and the potential complications are recognised in early pregnancy and managed effectively, the WHO (2011 recommended that women start ANC during the first trimester of pregnancy [15]. According to recent estimates, each year, more than 500,000 women between the ages of 15 and 49 die of causes related to pregnancy and childbirth, a leading cause of death among women in that age group. Almost all maternal deaths (99%) occur in the developing world, and more than half occur in Africa [16]. Pregnancy is a crucial time to promote healthy behaviours and parenting skills. Good ANC links the woman and her family with the formal health system, increases the chance of using a skilled attendant at birth, and contributes to good health through the life cycle. Inadequate care during this time breaks a critical link in the continuum of care and affects both women and babies [17]. Few studies currently exist to determine the timing of antenatal care and associated factors among pregnant women who attend antenatal care in Ugandan hospitals. Therefore, the overall objective of this study was to establish the factors associated with the timing of antenatal care among pregnant women attending ANC at Kampala International University Teaching Hospital. The study aims to determine the timing of first antenatal visits, associated factors, and the proportion of women making the visit within the recommended time at Kampala International University Teaching Hospital, Bushenyi, Western Uganda. To identify socio-demographic, obstetric, and health facility-related factors that influence the timing of these visits, assess the proportion of women making the visit within the recommended time, and identify potential health facility-related factors.

METHODOLOGY

Study design

This was a hospital-based cross-sectional observational and analytic study that employed quantitative methods of data collection to describe the variables of study participants and establish associations between the independent variables, dependent variables, and confounding variables. With this study design, the exposure and outcome are measured at the same time, making it cheaper in addition to being time-saving.

Study area

The researcher conducted the study at the antenatal clinic, which is under the Gynaecology department at KIU-TH, which is in Ishaka Town, a major town in Bushenyi district, and located in the north of Bushenyi district, south west of Mbarara district, and around 78km from Mbarara town, which is the biggest city in Western Uganda.

Bushenyi district is also located around 361km south-west of Kampala (the capital city) by road. Ishaka town's coordinates together with the municipality are believed to be 0o 32' 40.00''N, 30o 8' 16.00''E (latitude: 0.544445, longitude: 30.137778). The gynaecology department has a team of health workers that consists of nurses, interns, doctors, senior residents, and specialists. On average, about 25 patients visit the antenatal clinic per day.

Study population

All pregnant mothers attending the antenatal clinic at Kampala Internal University Teaching Hospital constituted the study population, provided they met the inclusion criteria.

Sampling Technique

We used simple random sampling to select the study participants. The purpose of the simple random sample was to minimize the possibility of human bias in the selection of cases for inclusion. With this method, the researcher identified the study population, chose the sample size, and folded small pieces of paper written on participants or non-participants, mixed them up, and put them in a box from which each participant was asked to select and not return them. Only those who picked papers written by participants were then asked to fill out a brief questionnaire. Each of the pregnant mothers had equal chances of participating in the study.

Sample size determination

Formula by Charan & Biswas [18] was used for determining sample size for this study

$$N = \frac{Z^2 (1 - p)}{d^2}$$

Where:

n is the sample size

Z is the standard normal deviate or variant (at 5% type 1 error and p<0.05, Z is 1.96)

P is the expected proportion of characteristic being measured in the target population based on previous studies (For this study, it is estimated at 17.4% or 0.174 which was the proportion of respondents who made their first ANC visit within recommended time [19].

d is the absolute error or level of statistical significance (For this study set at 0.05). Thus, by using this formula,

$$n = \frac{1.96^2 \; 0.174(1 - 0.174)}{0.05^2}$$

n= 220

Consequently, 220 was considered the required sample size for the proposed study.

Inclusion criteria

We included all pregnant mothers attending the antenatal clinic who consented to participate in the study.

Exclusion criteria

Pregnant mothers were unwilling to answer the interview questions.

Those who were severely ill.

Study procedure

The purpose of the study was explained to the study participants, after which they were given opportunities to ask questions, and their questions were answered accordingly. We sought written consent from the study participants. Those who consented to take part in the study were recruited to participate in the study, and they were given to complete the study questionnaires. Those who refused to consent were excused and were excluded from the study. During data collection, face-to-face- interviews, observation, and standard checklists were used to collect data from pregnant women.

Data collection instruments

Questionnaires were the main instrument of data collection used in this study. A questionnaire is a written form of questions that are systematically arranged to enable the researcher to come up with clear findings that can answer the research questions. A structured and pre-tested questionnaire was used to assess potential factors associated with the timing of the first antenatal visit among the pregnant mothers. A research questionnaire was prepared following the available literature and was used to capture data as required by specific objectives. The principle investigator collected the data under the guidance of the research supervisor.

Pretesting of the data collection tool

Two weeks prior to the start of data collection, pregnant mothers attending ANC at Mbarara Regional Referral Hospital tested the data collection tool. A few changes in the wording and questions were made where needed.

Reliability of the data collection tool.

Data obtained from a predetermined questionnaire was used to determine the Cronbach's alpha. An index of more than 0.8 was considered to indicate that the items of the questionnaire were reproducible and consistent.

Data Management

The dependent variable was the timing of the first ANC, which is dichotomized as late initiation (after 16 weeks of gestation), which was coded zero and otherwise as early, and the independent variables were socio-demographic characteristics, obstetric factors, and health facility-related factors, which were the confounding variables. We checked each questionnaire for completeness and consistency after data collection. Data was cleaned, coded, and entered into Epi-Info version 7 and exported to STATA version 14.0, and then exploratory data analysis was carried out to check the levels of missing values, the presence of influential outliers, independence of errors, multi-collinearity, and normality.

The data analysis plan is ready.

Descriptive statistics of frequencies and percentages were calculated for categorical variables and presented in the form of figures, tables, and texts. Continuous variables were described in the median (inter-quartile range, IQR), and categorical variables were described in percentages. Continuous variables were compared using the Mann-Whitney test, and categorical variables were compared using the Chi-square test or Fischer's exact test as appropriate. Binary and multiple logistic regressions were run to assess the association of various factors with the timing of the first antenatal visit. Variables significant at the P<0.20 level in the bivariate analysis were included in the final binary logistic regression analysis to identify independent predictors. The backward stepwise

regression method was applied to get a list of the best predictors, and any statistical test was considered significant at a P level less than 0.05 in the final model. Covariates were checked for interaction effects. Finally, the fitness of the model was checked by the Hosmer and Lemeshow tests. The results were presented in the form of tables, texts, and figures. The strength of the association between predictor variables was assessed using the odds ratio, and the significance of the variables was reported using a 95% confidence interval and p-values <0.05.

The concepts of quality assurance and quality control are essential.

The researcher ensured that the questionnaire was pre-tested on 5% of the sample of a similar population at the nearby hospital that was not part of the actual sample. The accuracy of the data was achieved through intensive training from the supervisor. The supervisor exercised close supervision over the principal investigator. It was ascertained whether the questions were properly filled out and necessary corrections were made on the spot. Each completed questionnaire was checked by supervisors. The questionnaires were prepared in English, translated into Lunyankole, and back translated to English by experts in both languages to compare the consistency before the actual data collection.

Ethical considerations

We obtained ethical clearance from Kampala International University's ethical review committee. Approval was also sought from the administration of the Kampala International University Teaching Hospital, where the research was conducted. All participants were informed about the purpose of the study, and written informed consent was obtained before enrollment. Respondents' names were not included anywhere in the data that was collected, and they were instead referred to using codes. To maintain privacy, the study participants were interviewed separately from each other so that they felt free to give responses without feeling uncomfortable that other people would hear them. There was no payment for taking part in the study. The study did not expose the participants to any risks.

RESULTS
The study participants provided descriptive statistics.
Socio-demographic characteristics of the study participants

A total of 220 participants were sampled from the antenatal clinic of Kampala International University Teaching Hospital, as presented in Table 1 below. The majority of the study participants, 39.55% (87/220), were in the age group of 16–23 years, while the minority of participants, 06.36% (14/220), were 38 years and older. On the variable of marital status, the majority of study participants, 68.64% (151/220), were married, while the minority, 05.45% (12/220), were cohabiting.

Regarding the occupation of study participants, the majority, 38.64% (85/220), were peasants, while 08.64% (19/220) were self-employed. The highest number (57.27%; 126/220) of the study participants were rural dwellers, whereas the minority (42.73%; 94/220) were from urban areas of residence. Anglicans comprised the highest proportion of study participants, with 38.18% (84/220), whereas 03.18 (07/220) belonged to other religions such as born-again, Seventh-day Adventist, etc. Regarding the level of education of the study participants, 34.55 (76/220) had not attained any level of education, while 14.09 (31/220) had acquired a primary level of education. Finally, when asked about the average monthly income, the majority of the study participants, 32.27 (71/220), revealed that they were earning less than half a million Ugandan Shillings, while 07.73 (17/220) said that they were earning a range of 1.6 million to 2 million.

Table 1: Frequency table of demographic characteristics of the study participants

Category	Options	Frequency(N)	Percentage
Age In Years	16-23 Years	87	39.55
	24-30 Years	66	30.00
	31-37 Years	53	24.09
	>38 Years Total	14	06.36
		220	100
Marital Status	Not Married	30	13.64
	Married	151	68.64
	Co-Habiting	12	05.45
	Divorced Total	27	12.27
		220	100
Occupation	Peasant	85	38.64
	Business	29	13.18
	Civil Servant	48	21.82
	Private Employee	39	17.73
	Self Employed	19	08.64
	Total	220	100
Area Of Residence	Urban	94	42.73
	Rural	126	57.27
	Total	220	100
Religion Of Study Participants	Catholic	82	37.27
	Anglican	84	38.18
	Jehovah Witness	37	16.82
	Moslem	10	04.55
	Others	07	03.18
	Total	220	100
Education Level	None	76	34.55
	Primary	31	14.09
	Secondary	62	28.18
	Tertiary Total	51	23.18
		220	100
Monthly Income	<500,000	71	32.27
	500,000-1,000,000	48	21.27
	1,100,000-1,500,000	32	14.55
	1,600,000-2,000,000	17	07.73
	>2,000,000	52	23.64
	TOTAL	**220**	**100**

There were 220 observations. The mean age of the study participants was 27 years with a standard deviation of 6 years from the mean. The minimum age was 16 years meanwhile the maximum age was 41 years. The data on age of the study participants had a variance of 39.87 with a positive skewness of 0.28 and a platy kurtosis of 1.92

Obstetric Characteristics of the study participants

Table 2 below shows the frequencies and percentages of obstetric characteristics of the study participants. As observed in the table, majority of the study participants 69.09% (153/220) had gravidity of <4 meanwhile 30.91% (68/220) had gravidity of ≥4. Majority of the participants 70.45% (155/220) were found to be having parity of <3 whereas he remaining 29.55% (65/220) had parity of ≥3. When asked whether the pregnancy for which they had gone for antenatal care was planned, more than half of study participants 54.55% (120/220) said it was planned as opposed to the 45.45% (100/220) who said the pregnancy was not planned. There as a negative history of abortion among 80.45% (177/220) meanwhile 19.55% (43/220) had a positive history of abortion in the previous pregnancy. Regarding contraceptive use, 78.64% (173/220) were not using contraceptives prior to getting pregnant meanwhile 21.36 (47/220) were using contraceptives before they decided to stop it in order to get pregnant. Minority of participants 32.36% (69/220) had a positive history of still birth meanwhile 68.64% (151/220) had never experienced a still birth. During the previous pregnancy, 72.73% (160/220) had not pregnancy related complications whereas pregnancy related complications were experienced by 27.27% (60/220)

of the study participants. When asked whether they think appropriate ANC follow up can prevent disease transmission from mother to child, 78.64% (173/220) said yes while 21.36% (47/220) said no. More than half of the study participants 55.00% (121/220) knew at least two danger signs during pregnancy whereas 45.00% (99/220) did not know any danger sign during pregnancy. Regarding history of caesarean section, 25.91% (57/220) of participants had undergone a caesarean section in previous delivery meanwhile majority of study participants 74.09% (163/220) had not undergone caesarean section in previous delivery. Majority of respondents 73.64% (162/220) said they recognized pregnancy using the HCG test while minority 26.36% (58/220) had recognized pregnancy using missed periods and lastly, 74.09% (163/220) of the participants rarely received support from their husbands on antenatal issues whereas 25.91% (57/220) always received support.

Table 2: Obstetric characteristics frequency table

CATEGORY	OPTIONS	FREQUENCY (n)	PERCENTAGE (%)
GRAVITY	<4	152	69.09
	>4	68	30.91
PARARITY	<3	155	70.45
	>3	65	29.55
PLANNED PREGNANCY	YES NO	120	54.55
		100	45.45
HISTORY OF ABORTION	YES	43	19.55
	NO	173	80.45
	TOTAL	220	100
HISTORY OF CONTRCEPTIVE	YES NO	47	21.36
		173	78.64
HISTORY OF STILL BIRTH	YES NO	69	31.36
		151	68.64
COMPLICATIONS DURING PREVIOUS PREGNANCY	YES NO	60	27.27
		160	72.73
ANC FOLLOWUP PREVENTS TRANSMISSION OF DISEASES TO UNBORN CHILD	YES NO	173	78.64
		47	21.36
AWARENESS TO DANGER SIGNS	YES NO	121	55.00
		99	45.00
CAESAREAN SECTION IN PREVIOUS DELIVERY	YES NO	57	25.91
		163	74.09
METHOD OF REGNISING PREGNANCY	MISSED PERIOD HCG TEST	58	26.36
		162	73.64
SUPPORT FROM HUSBAND ON ANTENATAL ISSUES	ALWAYS RARELY	57	25.91
		163	74.09

Health Services Related Characteristics of the study participants.

Shown in table 3 below are the health services characteristics of participants of this study. From the table it can be observed that majority of the participants 64.55% (142/220) said that the health workers had good attitude towards clients. Majority of the participants 64.09% (141/220) believed that the healthcare providers are over worked with a high proportion 74.09% (163/220) saying that there is no privacy at the antenatal clinic. Minority of the study participants 41.36% (91/220) said the waiting time at the clinic is not long and lastly majority of the participants 50.91% (112/220) got health information through community health campaigns.

Table 3: Frequency table for health services related characteristics

CATEGORY	OPTIONS	FREQUENCY (n)	PERCENTAGE (%)
Perceived Attitude of Health Workers	Poor Good	78 142	35.45 64.55
Belief That Workers Are Overworked	Yes No	141 79	64.09 35.91
Privacy At Antenatal Clinic	Yes No	141 79	74.09 25.91
Long Waiting Time	Yes No	91 129	41,36 58.64
Far Distance from Home To Facility	Yes No	130 90	59.09 40.81
Main Source of Health Information	VHT Health Worker At Facility Community Campaign **Total**	22 86 112 **220**	10.00 30.09 50.91 **100**

The Timing of First Antenatal Visit, And the Proportion of Women Who Make Their First Antenatal Visit within the Recommended Time at KIU-TH

Timing of First Antenatal Visit

As observed from table 4 below, a total of 220 women attending to antenatal clinic were sampled. The mean timing of first antenatal visit was at 18 weeks with a standard deviation of 7 weeks. The earliest times at which the participants made the first visit was at 4 weeks meanwhile the latest time at which study participants made the first visit was at 36 weeks.

Table 4: Timing of first antenatal visit

OBSERVATIONS	MEAN	Std Dev	MINUMUM	MAXIMUM
220	18.26	7.00	4	36

Distribution of study participants based on the weeks at which first antenatal visit was made

The highest proportion of study participants 37.37% (83/220) made their first antenatal visit at 17 to 21 weeks of gestation followed by 15.45% (34/220) of study participants who made their initial visit at 9 to 12 weeks of gestation. Conversely, minority of the study participants 01.36% (03/220) made their first visit at 4 weeks of gestation meanwhile 08.64% (19/220) made their first visit near to delivery.

Table 5: Distribution of study participants based on the weeks at which first antenatal visit was made

WEEKS OF GESTATION	FREQUENCY	PERCENTAGE
1-4	03	01.36
5-8	18	08.18
9-12	34	15.45
13-16	27	12.27
17-21	83	37.73
22-25	18	08.18
26-29	19	08.64
30-33	11	05.00
34-36	07	03.18

Proportion of Women Who Made Their First Antenatal Visit within the Recommended Time

Table 6 below shows the proportion of women who make their initial antenatal visit with the recommended period. It can be observed that minority of the study participants 31.36% (69/220) made their first antenatal visit before 16 weeks which is the recommended time by WHO for initiation of antenatal care. To the contrary, majority of study participants 68.64% (151/220) made their first antenatal visit at 16 weeks or more which is being classified as late visit for the purpose of this study.

Table 6: Proportion of Women Who Made Their First Antenatal Visit within the Recommended Time

TIMING OF FIRST VISIT	FREQUENCY	PERCENTAGE	95% CI
TIMELY	69	31.36	25.18-37.54
LATELY	151	68.64	62.46-75.82

Age Specific Timing of First Antenatal Visit among Women Attending Antenatal Care at KIU-TH

Shown in table 7 below is the age specific timing of first antenatal visit among women attending antenatal care at KIU-TH. The highest proportions of study participants who made first ANC visit within the recommended period were from the age group of $16 - 23$ years accounting for 52.87% (46/87) with a 95% confidence interval of $42.17 - 63.57$. The lowest number of participants who made the first visit within the recommended period were from the age group of $24 - 30$ years accounting for 13.64% (09/57) with a 95% confidence interval of $05.14 - 22.14$. The age group most affected by late attendance of antenatal care was the age group of $24 - 30$ years accounting for 86.36% (57/66) with a 95% confidence interval of $77.86 - 94.86$. The difference in the timing of first antenatal visit across the different age groups was statistically significant with a P value of <0.001 and a chi square value of 32.23 of age range (31-37years).

Table 7: Age Specific Timing of First Antenatal Visit among Women Attending Antenatal Care at KIU-TH

Age of study participants (years)	Total	Timing of first ANC		5% C I	
		Timely count (%)	Late count(%)	Timely	Late
16-23	87	46(52.87)	41(47.13)	42.17-63.57	36.43-57.83
24-30	66	09(13.64)	57(86.36)	05.14-22.14	77.86-94.86
31-37	53	10(18.87)	43(81.13)	07.98-29.76	70.24-92.02
>38	14	04(28.57)	10(71.43)	01.50-55.64	44.36-98.50

The Socio-Demographic Factors Associated with the Timing of First Antenatal Visit among Pregnant Mothers Attending Antenatal Clinic at KIU-TH, Bushenyi District

Shown in table 8 is the bivariate logistic regression to establish socio-demographic factors associated with the timing of first antenatal visit among pregnant mothers attending antenatal clinic at KIU-TH. Results of the analysis showed that 4 factors were significantly associated with timing of first antenatal visit among the study participants. Marital status was found to be significantly associated with timing of the first antenatal visit. Women who were married were 2.87 times more likely to report late for the first antenatal visit as compared to their counterparts who were not married (cOR2.87, 95%CI $1.29 - 6.39$, P=0.010) meanwhile women who were divorced were 3.27 times more likely to report late for the first antenatal visit than women who had never got married (cOR3.27, 95%CI $1.06 - 10.01$, P=0.038). Occupation of study participants had a statistical association with the timing of first antenatal visit with participants who were civil servants being 4.51 times more likely to go late for the first antenatal visit (cOR4.51, 95%CI $1.82 - 11.21$, P=0.001) meanwhile private employees were 2.99 times more likely to present late for the first antenatal visit than women who were peasants (cOR2.99, 95%CI $1.23 - 7.26$, P=0.016). Education level was significantly associated with timing of the first antenatal visit with those who had no education being 4.74 times more likely to present late for antenatal care than those who had tertiary level of education (cOR4.74, 95%CI $2.08 - 10.83$, P<0.001). Lastly, monthly income was also found to be statistically

associated with timing of first antenatal visit among the study participants. Those who had monthly income of more than 2 million were 24% less likely to attend the first antenatal visit late.

Table 8: Bivariate Logistic Regression Showing Socio-Demographic Factors Associated with the Timing of First Antenatal Visit among Pregnant Mothers Attending Antenatal Clinic At KIU-TH, Bushenyi District

VARIABLE	CATEGORY (years)	FIRST VISIT			5% C I	VALUE
		Timely (n=69)	Late (n=151)	cO R		
Age of participants	16-23	46(52.87)	41(47.13)	0.36	0.10-1.22	0.101
	24-30	09(13.64)	57(86.36)	2.53	0.65-9.83	0.179
	31-37	19(18.87)	43(81.13)	1.72	0.45-6.62	0.431
	>38	04(28.57)	10(71.43)	Reference		
Marital status	Married	43(28.48)	108(71.52)	2.87	1.29-6.39	0.010
	Co-habiting	03(25.00)	09(75.00)	3.43	0.77-15.22	0.105
	Divorced	07(25.93)	20(74.07)	3.27	1.06-10.01	0.038
	Not married	16(53.33)	14(46.67)	Reference		
Occupation	Business	07(24.14)	22(75.86)	2.42	0.93-6.28	0.069
	Civil servant	07(14.58)	41(85.42)	4.51	1.82-11.21	0.001
	Private	08(20.51)	31(79.49)	2.99	1.23-7.26	0.016
	employee	10(52.63)	09(47.37)	0.69	0.69-1.88	0.472
	Self employed Peasant	37(43.53)	48(56.47)	Reference		
Area	Rural	43(34.13)	83(65.87)	0.74	0.41-1.32	0.307
	Urban	26(27.66)	68(72.34)	Reference		
Religion	Anglican Jehovah witnessMoslem	27(32.14)	57(67.86)	0.98	0.51-1.88	0.952
	others	11(29.73)	26(70.27)	1.10	0.47-2.55	0.829
	Catholic	04(40.00)	06(60.00)	0.70	0.18-2.68	0.599
		01(14.29)	06(85.71)	2.79	0.32-24.34	0.354
		26(31.71)	56(68.29)	References		
Education level	None	12(15.79)	64(84.21)	4.74	2.08-10.83	<0.001
	Primary	13(41.94)	18(58.06)	1.23	0.50-3.03	0.651
	Secondary	20(32.26)	42(67.74)	1.87	O.87-4.01	0.110
	Tertiary	24(47.06)	27(52.94)	Reference		

The Obstetric Factors Associated with the Timing of First Antenatal Visit Among Pregnant Mothers Attending Antenatal Clinic At KIU-TH, Bushenyi District

Table 9 shows results of a bivariate logistic regression which was run to establish obstetric factors associated with timing of first antenatal visit among pregnant mothers attending antenatal clinic at KIU-TH. Results of the analysis showed that only 3 factors were significantly associated with timing of the first antenatal visit. The factors include; Gravidity, Parity and planned pregnancy. Pregnant mothers who had gravidity of ≥4 were 4.28 times more likely to present late for the antenatal care than their counterparts who had gravidity of <4(cOR4.28, 95% CI 1.97 − 9.26, P<0.001). Participants who had parity of ≥3 were 3.93 times more likely to report late for their first antenatal visit as compared to their counterparts who had parity of <3 (cOR3.93, 95%CI 1.81 − 8.53, P=0.001) and lastly, study participants who had unplanned pregnancy were 1.9 times more likely to present late for the first antenatal visit than those participants who had planned pregnancy (cOR1.9, 95%CI 1.05 − 3.42, P=0.033).

Table 9: Bivariate Logistic Regression to show the Obstetric Factors Associated with the Timing of First Antenatal Visit among Pregnant Mothers Attending Antenatal Clinic at KIU-TH

VARIABLE	CATEGORY	FIRST ANC	VISIT		5% C I	VALUE
		Timely (n=69)	Late (n=151)	cOR		
Perceived attitude of health workers	Poor	16(20.51)	62(79.49)	2.31	1.21-4.40	0.011
	Good	53(37.32)	89(62.68)	Reference		
Belief that health workers are overworked	Yes	40(28.37)	101(71.63)	1.46	0.81-2.63	0.202
	No	29(36.71)	50(63.29)	Reference		
Privacy at antenatal clinic	Yes	50(30.67)	113(69.33)	Reference		
	No	19(33.33)	38(66.67)	0.88	0.46-1.68	0.710
Long waiting time	Yes	20(21.98)	71(78.02)	Reference		
	No	49(37.98)	80(62.02)	0.45	0.18-1.71	0.013
Far distance from home to facility	Yes	34(26.15)	96(73.85)	1.80	1.01-3.20	0.046
	No	35(38.89)	55(61.11)	Reference		
Main source of information	VHT Facility	06(27.27)	16(72.73)	0.55	0.18-1.71	0.300
	Community	28(32.56)	58(67.44)77(	0.22	0.06-1.27	0.100
	Campaign	35(31.25)	68.75)			

cOR= Crude odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level

Multivariate Logistic Regression to Determine Factors Independently Associated with The Timing of First Antenatal Visit Among Pregnant Mothers Attending Antenatal Clinic At KIU-TH, Bushenyi District.

Table 9 shows the results of multivariate logistic regression to identify factors independently associated with the timing of first antenatal visit among pregnant mothers attending antenatal clinic at KIU-TH. Factors with p-value less than 0.20 at bivariate logistic regression analysis were considered for multivariate analysis. Through a stepwise logistic regression with removal of least significant variable in each step, Age, Marital status, Education level, Gravidity, Planned pregnancy Good attitude towards ANC, Perceived attitude of health workers and waiting time remained independently associated with the timing of first antenatal visit among the study participants. Women who were in the age group of $24 - 30$ years were 5.76 times more likely to attend their first antenatal visit late as compared to women who were in the age group of $16 - 23$ years (aOR5.76, 95%CI $2.19 - 15.19$, P<0.001). Study participants who were co-habiting were 7.49 times more likely to present late for the first antenatal visit than those who were not married (aOR7.49, 95%CI $1.06 - 53.14$, P=0.044). Pregnant mothers who had tertiary level of education were 78% less likely to report for the first antenatal visit than their counterparts who had no education (aOR0.22, 95%CI $0.07 - 0.64$, P=0.005). Women with a gravidity of ≥4 were 5.05 times more likely to attend the first antenatal visit late than women who had a gravidity of <4 (aOR5.05, 95%CI $1.35 - 18.95$, P=0.016). Study participants who had unplanned pregnancies were 2.8 times more likely to present late for the first antenatal visit (aOR2.28, 95%CI $1.04 - 5.02$, P=0.040). On the other hand, participants who had good attitude towards ANC were 61% less likely to attend the first antenatal visit late (aOR0.39, 95%CI $0.16 - 0.98$, P=0.046). Pregnant women who had a perception that the health workers had good attitude were 72% less likely to present late for the first antenatal visit (aOR0.28, 95%CI $0.11 - 0.68$, P=0.005). Then finally, study participants who said the long waiting time at the clinic did not prevent them from attending ANC were 69% less likely to attend the first antenatal visit late (aOR0.31, 95%CI $0.14 - 0.69$, P=0.004)

Table 10: Multivariate Logistic Regression to Determine Factors Independently Associated with the Timing of First Antenatal Visit Among Pregnant Mothers Attending Antenatal Clinic At KIU-TH

VARIABLE	CATEGORY	FIRST ANC VISIT			5% C I	VALUE
		Timely (n=69)	Late (n=151)	aOR		
Age of participants (years)	16-23	46(52.87)	41(47.13)			
	24-30	09(13.64)	57(86.36)	5.76	2.19-15.19	<0.001
	31-37	10(18.87)	43(81.13)	2.11	0.56-8.01	0.271
	>38	04(28.57)	10(71.43)	2.11	0.19-6.34	0.909
Marital status	Not married	16	14			
	Married	43	108	3.77	1.22-11.64	0.021
	Co-habiting	03	09	7.49	1.06-53.14	0.044
	Divorced	07(25.93)	20(74.07)	4.30	1.05-17.72	0.043
Education level	None	12(15.79)	64(84.21)			
	Primary	13(41.94)	18(58.06)	0.23	0.07-0.77	0.017
	Secondary	20(32.26)	42(67.74)	0.56	0.20-1.54	0.258
	tertiary	24(47.06)	27(52.94)	0.22	0.07-0.64	0.005
gravidity	<4	60(37.50)	92(62.50)			
	>4	09(24.00)	59(76.00)	5.05	1.35-18.95	0.016
Planned pregnancy	Yes	45(37.50)	75(62.50)			
	No	24(24.00)	76(76.00)	2.28	1.04-5.02	0.040
Good attitude towards ANC	Yes	49(28.32)	124(71.68)	Reference		
	No	20(42.55)	27(57.45)			
				0.39	0.16-0.98	0.046
Caesrean section in previousdelivery	Yes	13(22.81)	44(77.19)	Reference		
	No	56(34.36)	107(65.64)			
				0.75	0.31-1.82	0.531
Preserved attitude of health workers	Poor	16(20.51)	62(79.49)	Reference		
	Good	53(37.32)	89(62.68)			
				0.28	0.11-0.68	0.005
Belief that workers are overworked	Yes	40(28.37)	101(71.63)	Reference		
	No	29(36.71)	50(63.29)			
				0.82	0.37-1.82	0.625
Long waiting time	Yes	20(21.98)	71(78.02)	Reference		
	No	49(37.98)	80(62.02)			
				0.31	0.14-1.31	0.205
Far distance from health facility	Yes	34(26.15)	96(73.85)	Reference		
	No	35(38.89)	55(61.11)			
				0.61	0.28-1.31	0.205

aOR= Adjusted odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level

DISCUSSION

The Timing of the First Antenatal Visit and the Proportion of Women Who Make Their First Antenatal Visit Within the Recommended Time at KIU-TH

This study revealed that the mean timing of the first antenatal visit was at 18 weeks. The proportion of study participants who made the first antenatal visit within the recommended time was 31.36% (69/220), whereas 68.64% (151/220) of the study participants were late for the first antenatal visit. The age group of 16–23 years accounted for the highest number of participants who made the first ANC visit within the recommended time, accounting for 52.87% (46/87) with a 95% confidence interval of 42.17–63.57. On the other hand, the age group most affected by late antenatal care attendance was 24–30 years, accounting for 86.36% (57/66) with a 95% confidence interval of 77.86–94.86. Late attendance at antenatal care among pregnant women results in their not benefiting from preventative and curative measures. Openshaw et al. [20] in their study conducted in South Africa, found that the mean timing of the first ANC visit among pregnant women was 16 weeks from conception; this is slightly in line with the 18 weeks found in the present study. The present study's findings align with those of a study by Aung et al. [21], which reported a mean gestational age of 18.23 weeks at the first antenatal visit. The two studies' findings align, likely due to their conduct in African countries. Aduloju et al. [22] at the booking clinic of the Ekiti State University Teaching Hospital, south-western Nigeria, found a prevalence of early booking at 22.7%, whereas the present study found 31.36%. However, regarding the mean gestational age at the first antenatal visit, the previous study found that the mean gestational age at booking was 21.09 weeks, which was higher than the 18 weeks found in the present study. The differences in the study settings, conducted in teaching hospitals in different geographical locations, could have contributed to the discrepancy in the study findings. The result of the present study is higher than the result of a study done in Ethiopia, which found that the proportion of respondents who made their first ANC visit within the recommended time was 17.4%, as opposed to the 31.36% found in this study [19]. The findings of the present study are more than the results of a cross-sectional study among pregnant women in public health facilities in Debre Markos, which revealed that 33.4% made their first ANC visit after 16 weeks of gestation, as opposed to the 68.64% in the present study. However, the mean time for initiation of ANC in the present study is higher than the mean time of 14.5 weeks in the previous study [23]. The finding of the present study is higher than the result of a study by Aung et al. [21], which found that more than half of pregnant women (56.2%) took the first ANC for their present pregnancies after 16 weeks of gestation, as opposed to the 68.64% in the present study. Similarly, the 68.64% of late attendance is higher than the 42.0% found in a cross-sectional study by Gulema and Berhane [9]. The disagreement in the study findings could possibly be due to the difference in the sampling techniques employed in the two studies as well as the difference in study settings. The present study's findings indicate that 68.64% of the participants arrived late for their first antenatal visit, a lower percentage than the 72.0% observed in a study by Banda et al. [24] in Zambia's Copper Belt Province. Also, the findings of another study done in Zambia, still in the Copperbelt Province, revealed that the prevalence of late ANC attendance was 72.0% in Mpongwe, which is higher than the findings of the present study. The discrepancy in the study findings could have possibly come about due to the difference in study designs used in the two studies, in that the previous study was community-based whereas the present study was hospital-based. The current study's result falls short of a study by Gebremeskel et al. [19] in Ethiopia, which found that 82.6% of pregnant women started antenatal care late, compared to the current study's 68.64%.

The Socio-Demographic Factors Associated with the Timing of the First Antenatal Visit Among Pregnant Mothers Attending Antenatal Clinics at KIU-TH, Bushenyi District

The second specific objective of the present study was to determine the socio-demographic factors associated with the timing of the first antenatal visit among pregnant mothers attending the antenatal clinic at KIU-TH. Results showed that age, marital status, and level of education were the socio-demographic factors independently associated with the timing of the first antenatal visit. Women who were in the age group of 24–30 years were 5.76 times more likely to attend their first antenatal visit late as compared to women who were in the age group of 16–23 years (aOR 5.76, 95%CI 2.19–15.19, P<0.001). There is a possibility that adolescents may book late due to a lack of experience with pregnancy presentations, while elderly women may also book late due to previous favourable experience with no obstetric complications. Muhwava et al. [25] study supports this finding. Previous studies have shown that teenage pregnant women typically initiate antenatal care (ANC) late; this may be due to unplanned pregnancies and inadequate understanding of pregnancy symptoms. While older women may also delay ANC booking because of a good obstetric history, this finding from this study is in agreement with the result of a study done in Addis Ababa, which revealed that young age was an independent predictor of a timely booking for the first antenatal care attendance. The respondents who were below 25 years of age had 2.6 times higher odds of timely booking for ANC (AOR=2.56, 95% CI:1.11-3.72) than the pregnant women who were >35 years old.

When comparing adolescents to adults in south-eastern Tanzania, Gross et al. [26] found no evidence of delayed ANC initiation, although adolescent women initiated ANC slightly earlier than older women, with a mean of 5.0 months.

In their Ghanaian study, Manyeh, et al. [27] discovered a significant correlation between the age of the study participants and the timing of the first antenatal visit. This is in line with the findings of the present study. Gulema and Berhane [9] conducted another study in Ethiopia, which found a statistically significant association between maternal age and the timing of an antenatal visit. This is in agreement with the findings of the present study. The present study's results do not align with the findings of a study by Aduloju et al. [22], which suggested that women within the age range of 20–29 years were the most likely to book early, with 28.6%, while teenagers under the age of 19 years were the most likely to book late, with 100%. Marital status: study participants who were co-habiting were 7.49 times more likely to present late for the first antenatal visit than those who were not married (aOR 7.49, 95%CI 1.06–53.14, P = 0.044). The community's shame upon seeing such ladies pregnant, even though the men responsible for the pregnancy have not officially married them, could potentially explain this. Muhwava et al.'s [25] study, which established that marital status can influence the timing of ANC bookings, aligns with this finding. Similarly, Aung et al. (2016), in their hospital-based study, did a multivariate logistic regression analysis and discovered that the marital status of the pregnant woman was associated with the late initiation of antenatal care. Manyeh et al. [27] found no statistically significant correlation between marital status and the timing of an antenatal clinic visit among first-time mothers in rural southern Ghana. This is in disagreement with the findings of the present study. Gulema & Berhane [9] found no significant statistical association between the marital status of the pregnant women and the timing of the first antenatal visit, contrary to the findings of the present study. Level of education: pregnant mothers who had a tertiary education were 78% less likely to report for the first antenatal visit than their counterparts who had no education (aOR 0.22, 95%CI 0.07–0.64, P = 0.005). This might be due to the fact that educated mothers might be knowledgeable about what is necessary during pregnancy, the importance of ANC, and early booking, and they might book timely. This result is in agreement with the findings of a study by Muhwava et al. [25], who found that the level of education can influence the timing of ANC booking. Similarly, Manyeh et al. [27]) study in Ghana aligns with the results of the present study. Eraky [28] studied the determinants of non-adherence to antenatal care among pregnant women. Using correlation analysis, results indicated that there was a highly statistically significant relationship between the initial ANC and the GA/weeks education level of the pregnant women. This is in agreement with the findings of the present study. Gulema & Berhane [9] also found a significant association between maternal education and the timing of an antenatal visit, which is similar to the findings of the present study.

The Obstetric Factors Associated with the Timing of the First Antenatal Visit among Pregnant Mothers Attending Antenatal Clinic at KIU-TH, Bushenyi District

We found that gravity and having an unplanned pregnancy were the obstetric factors that independently predicted the timing of the first antenatal visit when we ran a multivariate logistic regression.

Gravidity: Women with a gravidity of ≥4 were 5.05 times more likely to attend the first antenatal visit late than women who had a gravidity of <4 (aOR 5.05, 95%CI 1.35–18.95, P = 0.016). This could probably be because the majority of such women with a gravidity of ≥4 might have had a good obstetric history free from complications, thereby making such women present late for antenatal care because they are confident that nothing will go wrong, just as it has been the case with their previous pregnancies. Aung et al. [21] found that parity was a significant determinant of late initiation of ANC, which aligns with the findings of this study. Odutayo and Omonigho [29] established a tendency for late registration for ANC among women of high gravidity, which aligns with the results of this study. It is possible that these women feel more confident after previous experience. Unplanned pregnancy: Study participants who had unplanned pregnancies were 2.8 times more likely to present late for the first antenatal visit (aOR 2.28, 95%CI 1.04–5.02, P = 0.040). It could be because those who had not planned for the pregnancy could have been caught unaware and thus looked some time before detecting that they were pregnant, and some of the women could have been facing conflicting loyalties and having difficulties deciding whether to keep the pregnancy or abort. As such, they delay and end up presenting late for antenatal care. The planning of a pregnancy has a direct bearing on the timing of initiating ANC. Sunil et al. [30] argued that women who wanted pregnancies had a 50% or lower risk of initiating ANC late in their pregnancies, which aligns with the findings of this study. Similarly, Tariku et al. [31]found that women with planned pregnancies tended to book early. A study by Mahwava *et al.* [25] is in line with the results of this study since they found that women who planned to be pregnant were more likely to initiate ANC earlier than women with unplanned pregnancies.

The Health Facility-Related Factors Associated with the Timing of the First Antenatal Visit among Pregnant Mothers Attending Antenatal Clinic at KIU-TH, Bushenyi District

Perception that Health Workers Are Overworked: Pregnant women who had a perception that the health workers had a good attitude were 72% less likely to present late for the first antenatal visit (aOR 0.28, 95%CI 0.11–0.68, P = 0.005). Having the perception that health workers are overworked at the facility has a direct effect on late ANC attendance since pregnant mothers who have such perceptions may hesitate to go to the facility for fear of being delayed as they could have other things to do. Therefore, pregnant women who hold such perceptions end up attending the first ANC visit late.

The findings of the present study are in line with the findings of a study done by Roberts et al. [32] in Malawi on the patient-provider relationship and antenatal care uptake at two referral hospitals, which found that pregnant women do not attend antenatal care early or do not attend at all as they perceive that the nurses are overworked and due to stress, the nurses are always shouting and yelling at clients. Waiting Time: Study participants who said the long waiting time at the clinic did not prevent them from attending ANC were 69% less likely to attend the first antenatal visit late (aOR 0.31; 95%CI 0.14–0.69; P = 0.004). Long hours of unattended waiting at the clinic may discourage mothers from presenting themselves early for ANC, whereas a short waiting time at the antenatal clinic could motivate pregnant women to attend ANC early. The findings of this study are in line with the results of a study conducted by Solarin and Black [33], who argued that a large proportion of pregnant women attend ANC late, and the reasons given were the delay by health care workers in the provision of care, and 40% of them booked late because they were told they were still early in the pregnancy and they ended up being booked in their third trimester. The finding of this study is in disagreement with the result of a study done by Gebresilassi et al. [19], which revealed that previous ANC service utilisation was not found to be statistically associated with timing of ANC; the study further found out that pregnant mothers who experienced early timing of ANC in their previous pregnancy preceding the current pregnancy failed to attend timely for the current pregnancy. This might be due to mothers' perceptions of not benefiting from their previous early timing of ANC.

CONCLUSION

The study found that most pregnant women who used the clinic started antenatal care (ANC) later than the WHO-recommended period of three months of pregnancy. The main reasons cited for the late start of ANC call for raising awareness of the best period to start ANC and the importance of starting ANC early. We identified factors associated with the late start of ANC, providing service providers with insights into parameters to target when promoting an early start to ANC.

RECOMMENDATIONS

The findings support the evidence that women still initiate ANC late, although the service is available and is free. This calls for other forms of media to raise awareness and promote starting ANC early. Continued education of women on initiating ANC early during their ANC visits is not enough because it will not make a difference to those who would have started ANC late. Women with first pregnancies are also at a disadvantage. If they are not informed about the benefits of starting ANC early, they may change their behaviour only in later pregnancies after having received education during the first pregnancy. The following recommendations are important to take into consideration, so there has to be an increase in the prevalence of early ANC attendance among pregnant women in Bushenyi district.

- We should use other media (television, radio, billboards, school curricula, pamphlets, and family planning clinics) to raise awareness of the importance of initiating ANC early.
- The Ministry of Health should consider introducing antenatal classes that are separate from antenatal check-up visits. We could use these as a platform to educate women on ANC and fill in the gaps in their knowledge.
- Health workers would educate prime-gravid women that having a complication-free delivery does not guarantee them to report late for ANC in the subsequent pregnancy.
- The Ministry of Health should consider changing working hours so as to accommodate working women. For example, ANC clinics could open on Saturdays or late in the evening on selected days of the week.
- Women of reproductive age should be educated to enroll in family planning so as to avoid having unplanned pregnancies.

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