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Determinants of First Antenatal Visit Timing Among Pregnant Women in Antenatal Care at Kampala International University Teaching Hospital, Western Uganda

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ABSTRACT

Optimal antenatal care (ANC) plays a pivotal role in promoting maternal health and well-being, a standard healthcare service provided globally to expectant mothers, offering essential health assessments and guidance throughout pregnancy, childbirth, and early parenthood. Timely initiation of ANC is crucial, commencing from the beginning of pregnancy until childbirth. This study aimed to ascertain the timing of the first antenatal visit, explore associated factors, and determine the proportion of pregnant women adhering to the recommended schedule when attending antenatal care at Kampala International University Teaching Hospital in Bushenyi, Western Uganda. A hospital-based cross-sectional observational and analytical study involved 220 randomly selected participants from the antenatal clinic. Univariate, bivariate, and multivariate logistic regression analyses using STATA version 14.0 were conducted to identify factors influencing the timing of the first antenatal visit. Odds ratios with 95% confidence intervals were computed at the bivariate level, while adjusted odds ratios were calculated during multivariate analysis to determine independently significant factors. The mean age of the participants was 27 years, with a standard deviation of 6 years. The minimum age was 16 years, while the maximum was 41 years. The average timing of the first antenatal visit was at 18 weeks. Only 31.36% (69/220) of participants adhered to the recommended schedule, while 68.64% (151/220) initiated ANC later. Factors such as age, marital status, education level, gravidity, planned pregnancy, attitude towards ANC, perception of health workers' attitudes, and waiting time were independently associated with the timing of the first antenatal visit. This study revealed that a significant proportion of pregnant women in the clinic commenced ANC later than the WHO-recommended period, emphasizing the need to raise awareness about the optimal timing for ANC initiation. Additionally, factors contributing to delayed initiation were identified, offering valuable insights for service providers to focus on when promoting early ANC attendance.

Keywords: antenatal visit, pregnant mothers, antenatal care, labour.

INTRODUCTION

The antenatal care (ANC) provision or regular check-ups during pregnancy through the public health services in modern obstetrics was started during 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 [1-8]. 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 is important for the development of a healthy baby and may have long-term beneficial effects on the health of the child [9-17].

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 [18-26]. Antenatal care (ANC) provides a stand for central healthcare tasks, including health promotion, screening and diagnosis, and disease prevention. It remains to be a vital health care tool to reduce the risk of stillbirths, preterm labor and pregnancy complications [27-34].

Every year, around the world maternal deaths contribute to more than half a million of deaths, and of these, 99% occur in developing countries and 286,000 of maternal deaths as a result of complications that can be avoided through fitting antenatal care in term of early antenatal care booking and follow up visits as often as possible. 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 10 of four visits is too low. In addition, the first consultation is often made late in pregnancy, whereas maximum benefit requires early initiation of antenatal care [35-45].

Research recommended 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 [46-50]. 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 [51-55].

METHODOLOGY

Study design

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

Study area

The researcher conducted the studyat antenatal clinic which is under the Gynaecology Department at KIU-TH.

Study population

All pregnant mothers attending antenatal clinic at Kampala Internal university teaching hospital constituted the study population provided they met the inclusion criteria.

Sampling Technique

Simple random sampling was used to select the study participants.

Sample size determination

Formula by Charan&Biswas, (2013) was used for determining sample size for this study

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

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 wasthe proportion of respondents who made their first ANC visit within recommended time [18].

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

Inclusion criteria

All pregnant mothers attending the antenatal clinic who consented to take part in the study were included.

Exclusion criteria

- Pregnant mothers who 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. Written consent was sought 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 meanwhile those who refused to consent were excused and were excluded from the study. During data collection, face-to-face-interview, observation and standard checklists were used to collect data from pregnant women.

Data analysis plan

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 median (inter-quartile range, IQR) and categorical variables were described in percentages. Continuous variables were compared using Mann-Whitney test and categorical variables were compared using 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 timing of the first antenatal visit. Variables significant at 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 best predictors and any statistical test was considered significant at P level less than 0.05 in the final model. Covariates were checked for interaction effect. Finally, the fitness of the model was checked by Hosmer and Lemeshow test. The results were presented in the form of tables, texts and figure. The strength of association of predictor variables were assessed using odds ratio and significance of variables wasreported by using 95% confidence interval and p-values <0.05.

Ethical considerations

Ethical clearance was obtained from an ethical review committee of Kampala International University. Approval was also sought from the administration of Kampala international university teaching hospital where the research was conducted. All participants were informed about the purpose of the study and a written informed consent was obtained before enrolment. 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 participants were not subjected to any risks during the study.

RESULTS

A total of 220 participants were sampled from the antenatal clinic of Kampala International University teaching hospital as presented in table 1 below. Majority of the study participants 39.55% (87/220) were in the age group of 16 – 23 years meanwhile the minority of participants 06.36% (14/220) were 38 years and above.

On the variable of marital status, majority of study participants 68.64% (151/220) were married while the minority 05.45% (12/220) of the study participants were cohabiting.

Regarding occupation of study participants, majority 38.64% (85/220) were peasants meanwhile 08.64% (19/220) were self0employed. The highest number 57.27% (126/220) of the study participants had been 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.

Pertaining to the level of education of study participants, 34.55 (76/220) had not attained any level of education meanwhile 14.09 (31/220 had acquire primary level of education and finally when asked about the average monthly income, majority of the study participants 32.27 (71/220) revealed that they were earning less than half a million Ugandan Shillings meanwhile 07.73 (17/220) said

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that they were earning ranging from 1.6 million to 2 Million.

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

CATEGORY	OPTIONS	FREQUENCY(n)	RCENTAGE(%)
Age in Years	16 – 23 Years	8	73.955
	24 – 30 Years	6	63.00
	31 – 37 Years	5	32.409
	38 Years and above	1	40.636
	TOTAL	**220**	**100**
Marital status	Not Married	3	01.364
	Married	151	68.64
	Co-habiting	12	05.45
	Divorced	27	12.27
	TOTAL	**220**	**100**
Occupation	Peasant	85	38.64
	Business	29	13.18
	Civil servant	42	18.21
	Private employee	37	17.73
	Self employed	9	04.09
	TOTAL	**220**	**100**
Area of Residence	Urban	94	43.73
	Rural	126	57.27
	TOTAL	**220**	**100**
Religion of study participants	Catholic	73	32.27
	Anglican	84	38.18
	Jehova witness	16	07.28
	Muslim	5	02.55
	Others	38	17.28
	TOTAL	**220**	**100**
Education Level	None	64	35.55
	Primary	11	04.09
	Secondary	28	12.18
	Tertiary	13	05.91
	TOTAL	**220**	**100**
Monthly Income	< 500,000	72	32.73
	500,00 – 1,000,000	41	18.21
	1.1 Million - 1.5 Million	14	06.45
	1.6 Million – 2 Million	70	32.73
	> 2 Million	23	10.64
	TOTAL	**220**	**100**

Presented in table 2 is the descriptive statistics for the age of the study participants. 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.

Table 2: Shows the descriptive statistics of participants' age

Observations	Mean	StdDev	Minimum	Maximum	Variance	Skewness	Kurtosis
220	26.95	6.311	64	1	39.87	0.28	1.92

Table 3 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 3: Obstetric characteristics frequency table

CATEGORY	OPTIONS	FREQUENCY(n)	RCENTAGE(%)
Gravidity	< 4	152	69.09
	≥ 4	68	30.91
	TOTAL	**220**	**100**
Parity	< 3	157	71.45
	≥ 3	63	28.55
	TOTAL	**220**	**100**
Planned Pregnancy	Yes	125	55.45
	No	95	44.55
	TOTAL	**220**	**100**
History of Abortion	Yes	43	19.55
	No	177	80.45
	TOTAL	**220**	**100**
History of Contraceptive use	Yes	127	57.73
	No	93	42.27
	TOTAL	**220**	**100**
History of Still Birth	Yes	61	27.73
	No	159	72.27
	TOTAL	**220**	**100**
Complications during previous pregnancy	Yes	72	32.73
	No	148	67.27
	TOTAL	**220**	**100**
ANC followup prevents transmission of diseases to unborn child	Yes	177	80.45
	No	43	19.55
	TOTAL	**220**	**100**
Awareness of danger signs	Yes	125	55.45
	No	95	44.55
	TOTAL	**220**	**100**
Caesarean section in previous delivery	Yes	57	25.91
	No	163	74.09
	TOTAL	**220**	**100**
Method of recognizing pregnancy	Missed Period	58	26.36
	HCG test	162	73.64
	TOTAL	**220**	**100**
Support from husband on Antenatal issues	Always	57	25.91
	Rarely	163	74.09
	TOTAL	**220**	**100**

Shown in table 4 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 4: Frequency table for health services related characteristics

CATEGORY	OPTIONS	FREQUENCY(n)	RCENTAGE(%)
Perceived attitude of health workers	Poor	78	35.45
	Good	142	64.55
	TOTAL	**220**	**100**
Belief that health workers are overworked	Yes	142	64.09
	No	79	35.91
	TOTAL	**220**	**100**
Privacy at Antenatal clinic	Yes	163	74.09
	No	57	25.91
	TOTAL	**220**	**100**
Long waiting time	Yes	91	41.36
	No	129	58.64
	TOTAL	**220**	**100**
Far Distance from home to facility	Yes	59	09.09
	No	94	40.91
	TOTAL	**220**	**100**
Main source of health information	VHT	21	10.00
	Health worker at facility	86	39.09
	Community Campaign	112	50.91
	TOTAL	**220**	**100**

As observed from table 5 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 5: Timing of first antenatal visit

Observations	Mean	Standard Deviation	Minimum	Maximum
220	18.267	.004	3	6

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

Weeks of Gestation	Frequency	Percentage
1 – 4 weeks	30	13.6
5 – 8 weeks	80	8.1
9 – 12 weeks	41	5.4
13 – 16 weeks	71	2.7
17 – 21 weeks	33	7.3
22 – 25 weeks	80	1.8
26 – 29 weeks	90	8.6
30 – 33 weeks	10	5.0
34 – 36 weeks	70	3.1

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 7; 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
Late	151	68.64	62.46 – 75.82

Shown in table 8 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.

Table 8; Age Specific Timing of First Antenatal Visit among Women Attending Antenatal Care at KIU-TH

Age of the study participants	Total	Timing of first ANC		5 % CI		Chi Value Square (X^2)	
		Timely Count, (%)	Late Count, (%)	Timely	Late		
16 – 23 Years	87	46 (52.87)	41 (47.13)	42.17 – 63.57	36.43 – 57.83		
24 – 30 Years	66	09(13.64)	57(86.36)	05.14 – 22.14	77.86 – 94.86		
31 – 37 Years	53	10 (18.87)	43 (81.13)	07.98 – 29.76	70.24 – 92.02	32.23	<0.001
38 Years and above	14	04(28.57)	10 (71.43)	01.50 – 55.64	44.36 –98.50		

Shown in table 9 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 9: 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	RST ANC VISIT		OR	95% CI	VALUE
		Timely at e (n=69)	(n=151)			
Age of Participants	16 – 23 Years	46 (52.87)	41 (47.13)	0.36	0.10 – 1.22	0.101
	24 – 30 Years	09 (13.64)	57 (86.36)	2.53	0.65 – 9.83	0.179
	31 – 37 Years	10 (18.87)	43 (81.13)	1.72	0.45 – 6.62	0.431
	38 Years and above	04 (28.57)	10 (71.43)	Reference		
Marital status	Not Married	16 (53.33)	14 (46.67)	Reference		
	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**
Occupation	Peasant	37 (43.53)	48 (56.47)	Reference		
	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 employee	08 (20.51)	31 (79.49)	2.99	1.23 – 7.26	**0.016**
	Self employed	10 (52.63)	09 (47.37)	0.69	0.26 – 1.88	0.472
Area	Urban	26 (27.66)	68 (72.34)	Reference		
	Rural	43 (34.13)	83 (65.87)	0.74	0.41 – 1.32	0.307
Religion	Catholic	26 (31.71)	56 (68.29)	Reference		
	Anglican	27 (32.14)	57 (67.86)	0.98	0.51 – 1.88	0.952
	Jehova witness	11 (29.73)	26 (70.27)	1.10	0.47 – 2.55	0.829
	Muslim	04 (40.00)	06 (60.00)	0.70	0.18 – 2.68	0.599
	Others	01 (14.29)	06 (85.71)	2.79	0.32 – 24.34	0.354
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	0.87 – 4.01	0.110
	Tertiary	24 (47.06)	27 (52.94)	Reference		
Monthly Income in Ugandan Shillings	< 500,000	18 (25.35)	53 (74.65)	Reference		
	500,00 – 1 M	16 (33.33)	32 (66.67)	0.68	0.30 – 1.52	0.346
	1.1 M – 1.5 M	11 (34.38)	21 (65.94)	0.65	0.26 – 1.60	0.348
	1.6 M – 2 M	08 (47.06)	09 (52.94)	0.38	0.13 – 1.14	0.084
	> 2 Million	16 (30.77)	36 (69.23)	0.76	0.34 – 1.69	**<0.001**

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

Table 10 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 10; Bivariate Logistic Regression to showthe Obstetric Factors Associated with the Timing of First Antenatal Visit among Pregnant Mothers Attending Antenatal Clinic at KIU-TH

VARIABLE	CATEGORY	FIRST ANC VISIT		OR 5% CI	VALUE
		Timely ate (n=69)	(n=151)		
Gravidity	< 4	60 (39.47)	92 (60.53)	Reference	
	≥ 4	09 (13.24)	59 (86.76)	4.28 1.97 – 9.26	**<0.001**
Parity	< 3	60 (38.71)	92 (60.53)	Reference	
	≥ 3	09 (13.24)	59 (86.76)	3.93 1.81 – 8.53	**0.001**
Planned Pregnancy	Yes	45 (37.50)	75 (62.50)	Reference	
	No	24 (24.00)	76 (76.00)	1.9 1.05 – 3.42	**0.033**
History of Abortion	Yes	16 (37.21)	27 (62.79)	Reference	
	No	53 (29.94)	124 (70.06)	1.39 0.69 – 2.78	0.358
Contraceptive use	Yes	13 (27.66)	34 (72.34)	Reference	
	No	56 (32.37)	117 (67.63)	0.80 0.39 – 1.63	0.538
History of Still Birth	Yes	25 (36.23)	44 (63.77)	Reference	
	No	44 (29.14)	107 (70.86)	1.38 0.76 – 2.53	0.294
Complications	Yes	19 (31.67)	41 (68.33)	Reference	
	No	50 (31.25)	110 (68.75)	1.02 0.54 – 1.93	0.953
Good Attitude towards ANC	Yes	49 (28.32)	124 (71.68)	Reference	
	No	20 (42.55)	27 (57.45)	0.53 0.27 – 1.04	0.064
Awareness of danger signs	Yes	38 (31.40)	83 (68.60)	Reference	
	No	31 (31.31)	68 (68.69)	1.00 0.57 – 1.78	0.988
Caesarean section in previous delivery	Yes	13 (22.81)	44 (77.19)	Reference	
	No	56 (34.36)	107 (65.64)	0.56 0.28 – 1.13	0.108
Method of recognizing pregnancy	Missed Period	15 (25.86)	43 (74.14)	Reference	
	HCG test	54 (33.33)	108 (66.67)	0.70 0.36 – 1.37	0.294
Support from husband on Antenatal issues	Always	18 (31.58)	39 (68.42)	Reference	
	Rarely	51 (31.29)	112 (68.71)	1.01 0.53 – 1.94	0.968

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

Results from the bivariate logistic regression showed that 3 health services related factors were statistically associated with timing of first antenatal visit among the study participants. The factors include; Perceived attitude of health workers, Waiting time and distance from home to health facility. Study participants who had a perception that health workers had poor attitude were 2.31 times more likely to attend their first antenatal visit late (cOR2.31, 95%CI 1.21 – 4.40, P=0.011). On the other hand, participants who said the long waiting time at the antenatal clinic did not result into them not attending were 55% less likely to present late for their first antenatal visit than those who said the long waiting time at the clinic resulted in them not attending (cOR0.45, 95%CI 0.25 – 0.85, P=0.013). and lastly, participants who said the distance between their home and the health facility is far were 1.80 times more likely to present late for antenatal visit compared to their counterparts whose homes were not far from the facility (cOR1.80, 95%CI 1.01 – 3.20, P=0.046).

Table 11; Bivariate Logistic Regression to show The Health Facility Related Factors Associated With The Timing Of First Antenatal Visit Among Pregnant Mothers Attending Antenatal Clinic At KIU-TH

VARIABLE	CATEGORY	FIRST ANC VISIT		OR 5% CI	VALUE
		Timely ate (n=69)	ι=151)		
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 0.82 – 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 0.25 – 0.85	**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 health information	VHT	06 (27.27)	16 (72.73)	Reference	
	Facility	28 (32.56)	58 (67.44)	0.55 0.18 – 1.71	0.300
	Community Campaign	35 (31.25)	77 (68.75)	0.22 0.06 – 1.27	0.100

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

Table 10 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 12; 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		OR 5% CI	VALUE
		Timely ate (n=69)	(n=151)		
Age of Participants	16 – 23 Years	46 (52.87)	41 (47.13)	Reference	
	24 – 30 Years	09 (13.64)	57 (86.36)	5.76 2.19 – 15.19	**<0.001**
	31 – 37 Years	10 (18.87)	43 (81.13)	2.11 0.56 – 8.01	0.271
	38 Years or +	04 (28.57)	10 (71.43)	1.11 0.19 – 6.34	0.909
Marital status	Not Married	16 (53.33)	14 (46.67)	Reference	
	Married	43 (28.48)	108 (71.52)	3.77 1.22 – 11.64	**0.021**
	Co-habiting	03 (25.00)	09 (75.00)	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)	Reference	
	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 (39.47)	92 (60.53)	Reference	
	≥ 4	09 (13.24)	59 (86.76)	5.05 1.35 – 18.95	**0.016**
Planned Pregnancy	Yes	45 (37.50)	75 (62.50)	Reference	
	No	24 (24.00)	76 (76.00)	2.28 1.04 – 5.02	**0.040**
Good Attitude towards ANC	No	49 (28.32)	124 (71.68)	Reference	
	Yes	20 (42.55)	27 (57.45)	0.39 0.16 – 0.98	**0.046**
Caesarean section in previous delivery	Yes	13 (22.81)	44 (77.19)	Reference	
	No	56 (34.36)	107 (65.64)	0.75 0.31 – 1.82	0.531
Perceived 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 health 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 – 0.69	**0.004**
Far Distance from home to 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

This study revealed that the mean timing of 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 participates 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 52.87% (46/87) with a 95% confidence interval of 42.17 – 63.57 meanwhile 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 finding of this study is in agreement with the findings of Gross *et al.* [56] which showed that many pregnant women in sub-Saharan Africa tend to start ANC late. However, in the previous study, adolescents were found to be the most affected whereas in the present study the most affected age group is that of 24 – 30 years. This can be explained by the fact that majority of mothers in the age of 24 – 30 years have at least had some experience with giving birth and therefore they are no longer nervous nor afraid hence the delay in reporting for initiation

of antenatal care. Late attendance of antenatal care among pregnant women results in them not benefiting from preventative and curative measures. The finding of this study is higher than what was found in a study done by Aduloju *et al.* [57] at the booking clinic of the Ekiti State University Teaching Hospital, south western Nigeria which indicated a prevalence of early booking at 22.7% whereas the present study had 31.36%. However, regarding the mean gestational age at 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 Aduloju *et al.* [57]. The difference in the study findings could have risen due the difference in the study settings much as both studies were conducted from teaching hospitals though in different geographical locations. The result of the present study is higher than result of a study done in Ethiopia which found that the proportion of respondents who made their first ANC visit within recommended time was 17.4% as opposed to the 31.36% found in this study [18]. The finding of the present study is 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. Result of the current study is lower than the finding of study conducted by Gebremeskel *et al.* [18] in Ethiopia identified that that 82.6% of pregnant women initiated antenatal care late as contrasted to the 68.64% in the current study. The finding from this study is in line with the results of a study done by Aung et al. [58] who found that parity was a significant determinant of late initiation of ANC. Results of this study are in agreement with findings from a study done by Odutayo & Omonigho [59] who established that there was a tendency of late registration for ANC among women of high gravidity. It is possible that these women feel more confident after previous experience

CONCLUSION

The study discovered that most pregnant women who utilized the clinic initiated ANC later than the period recommended by WHO of within three months of pregnancy. The main reasons cited for late start of ANC call for raising awareness of the best period to start ANC and the importance of starting ANC early. Factors associated with the late start of ANC were identified, thus giving the service providers insights into parameters that need to be targeted when promoting an early start to ANC.

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