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Abstract

Purpose: The purpose of this research is to identify the prevalence of adherence to the recommended four antenatal care (ANC) visits and to analyze factors associated with achieving the fourth ANC visit among pregnant women attending Ruli District Hospital in Gakenke District, Rwanda. The study aims to address gaps in ANC attendance, focusing on improving maternal and fetal health.

Methodology: A cross-sectional study design was used, with a sample size of 421 women, determined through Fisher et al.'s (1998) formula. Systematic sampling was employed to select participants between November 20, 2023, and January 20, 2023. Data collection included informing participants about the study and obtaining consent. Confidentiality was maintained by anonymizing participant data. Analysis was conducted using SPSS version 25, applying descriptive statistics such as percentages, means, and frequencies. Bivariate and multivariate regression analyses were used to identify relationships between independent and dependent variables, with significance assessed at $p < 0.05$.

Findings: The study found that 57.5% of respondents adhered to the four recommended ANC visits, while 42.5% attended fewer than four. Factors significantly associated with increased ANC attendance included higher educational attainment, abstinence from alcohol by both the mother (AOR=1.953, CI: 1.202-3.174, P<0.007) and husband (AOR=2.041, CI: 1.112-3.747, P<0.002), planned pregnancies (AOR=4.159, CI: 1.975-10.326, P<0.001), and absence of mistreatment toward women (AOR=3.040, CI: 1.367-6.762, P=0.006).

Unique Contribution to Theory, Practice and Policy: The study recommends enhanced supportive supervision and mentorship of Community Health Workers for home visits to pregnant women. Additionally, improving customer care and the quality of ANC services is advised. These insights are expected to guide policymakers in Rwanda, including the Ministry of Health, Ruli District Hospital, and other stakeholders, in enhancing ANC adherence and improving maternal health outcomes.

Keywords: *Prevalence, Factors, Fourth Standard Antenatal Care, Pregnant Women*

INTRODUCTION

In the year 2020, the global count of women and girls who lost their lives due to complications during pregnancy and childbirth exceeded 287,000. A substantial majority of these maternal deaths (95%) transpired in developing countries, specifically within nations with lower and moderate economic statuses. Countries within the Sub-Saharan region accounted for over 202,000 maternal fatalities (70%), while Southern Asia recorded more than 47,000 maternal deaths (16%). Notably, the maternal mortality rate stood at 430 per 100,000 live births in economically disadvantaged nations and contrastingly, it was 12 per 100,000 live births in more affluent countries (World Health Organization (WHO), 2023).

Rwanda remains plagued by elevated rates of maternal and neonatal mortality. Within this context, the neonatal mortality rate was 19 per 100,000 live births, whereas the maternal mortality rate was significantly higher, reaching 203 per 100,000 live births (RDHS, 2019-2020).

A substantial portion of these maternal deaths could have been averted with timely and exceptional antenatal care services. These vital services, administered by proficient healthcare practitioners, encompass health promotion, preventive measures, early screening and diagnosis, and timely management of complications arising during pregnancy and childbirth (WHO, 2023).

According to the Global UNICEF Report covering the years 2015 to 2021, over 88.3% of women received antenatal care on at least one occasion while pregnant, and approximately 66.3% underwent antenatal care at a minimum of four instances throughout their pregnancy. Notably, the frequency of women participating in at least four ANC appointments varies by region. The statistics reveal percentages such as 87.7% in East Asia and the Pacific, 91.1% in Latin America and the Caribbean, 54.8% in South Asia, 53.6% in Sub-Saharan Africa, 53% in Western and Central Africa, and 54.3% in Eastern and Southern Africa (UNICEF global databases, 2022).

Based on the findings of the Kenya Demographic Health Survey Report in 2022, the total proportion of women who attended a minimum of four antenatal care visits was 66%. Notable differences were noticed between urban and rural regions, with rates of 74% and 62% respectively (KDHS, 2022). In Rwanda, 47% of pregnant women attended four or more ANC visits throughout their pregnancy (RDHS, 2019-2020).

In 2016, a research project was carried out in Kenya to investigate the elements that impact the utilization of specialized antenatal care in the sub-counties of Malindi and Magarini within Kilifi County. The study pinpointed various factors such as residing in rural areas, level of education, prolonged waiting periods for ANC services, absence of accessible ANC services, and insufficient familiarity with specialized antenatal care as influencers leading to the underutilization of these services (Chorongo et al., 2016).

The World Health Organization (WHO) envisions a global scenario where both expectant mothers and newborns receive comprehensive care spanning pregnancy, childbirth, and the postnatal phase. Within the realm of reproductive healthcare, antenatal care assumes a crucial role, encompassing health education, diagnosis, and preventive measures. Research underscores that timely, evidence-based practices within antenatal care can have life-saving effects. This facet of healthcare serves as a crucial avenue for providing support to women, families, and communities during pivotal stages in a woman's life (Rurangirwa et al., 2018).

Various studies conducted across different countries have revealed that certain factors contribute significantly to late antenatal care initiation. Predisposing factors like advanced maternal age, lack of education, unemployment or agricultural work, affiliation with the Muslim faith, single marital status, having four or more living children, lack of media exposure, and a perception of starting antenatal care after the first trimester have been identified (Alex et al., 2019).

Enabling factors, such as a lower socioeconomic status, rural residence, lack of health insurance, limited participation in decision-making, and reliance on private clinics for ANC services, have also been linked to late antenatal care initiation (Alex et al., 2019). Lastly, need factors like unplanned pregnancies or pregnancies unwanted by the mother, and experiencing complications in previous pregnancies have been significantly correlated with delays in commencing antenatal care (Alex et al., 2019).The main objective of this study was to assess the prevalence and factors associated with the fourth standard antenatal care utilization among pregnant women attending Ruli District Hospital, Rwanda. It was guided by the following specific objectives:

i. To determine prevalence of the fourth standard antenatal care utilization among pregnant women attending Ruli District Hospital, Rwanda.
ii. To assess factors associated with the fourth standard antenatal care utilization among pregnant women attending Ruli District Hospital, Rwanda.

Problem Statement

Globally, the coverage of four ANC visits among pregnant women is around 66.3%. Coverage of four ANC is too low in low- and middle-income countries. South Asia (54.8%), Sub-Saharan Africa (53.6%), Western and Central Africa (53%) and Eastern and Southern Africa (54.3%) (UNICEF global databases, 2022). In Rwanda, 47% of expectant women participated in four or more antenatal care visits while pregnant (RDHS, 2019-2020).

In Ruli hospital catchment area, as stated in the report from the Rwanda Health Management Information System (HMIS), the rate is 52%, slightly high compared to the national. However, it did not reach the district target of 62,3%. Furthermore, there are still health centers that are lagging behind like Nyange (28%) while others like Coko (78%) performed well (RHMIS, 2022). In addition, within the catchment region of Ruli District Hospital from 2019 to 2022, the total number of birth asphyxia is 173 cases, 262 home deliveries and 8 maternal deaths.

The World Health Organization's (WHO) new ANC guideline suggests a total of eight contacts during pregnancy (WHO, 2016). Going from four ANC visits to eight ANC contacts is still a major challenge, while the coverage of four ANC visits is still low. If a pregnant woman does not utilize ANC services early and complete recommended ANC visits, it was lead to different pregnancy and childbirth related complications and finally to maternal deaths, newborn deaths etc. As fa as there has been no similar study focusing on the antenatal care in Ruli hospital, this one is necessary to evaluate the occurrence and elements linked with the utilization of the fourth standard antenatal care (ANC) as advised by the World Health Organization. It was be helpful to increase ANC utilization and improve maternal and newborn health and well-being in Ruli District Hospital catchment area.

METHODOLOGY

Research Design

In this study, the researcher used a descriptive research design and adopted a quantitative research approach.

Participants

All women with reproductive age 15 -49 years who attended ANC and delivered at 8 mentioned health centers of Ruli District Hospital catchment area. The Study was done from November 20th 2023 to October 20th 2024. As per the data from the Rwanda Health Information System report, the projected count of women anticipated to become pregnant in the year 2023 within the catchment area of Ruli District Hospital is approximately 2,997 (RHMIS, 2023). The decision to deliberately choose the Ruli District Hospital catchment area was based on specific factors, namely the elevated incidence of home deliveries, instances of birth asphyxia, and the insufficient coverage of the recommended four standard antenatal care visits. Using the Fischer formula, the calculated sample was 383. After adding 10% of sample size to cover non-respondent subjects, the sample size to be used became 421.

Research Instruments

In this research, a structured questionnaire was employed for gathering primary data concerning the variables among the study participants. The structured questionnaire was devised by drawing from existing literature that delved into the determinants of antenatal utilization. The questionnaire comprises three distinct sections: the first section pertains to inquiries about predisposing factors, encompassing socio-demographic and obstetrics history. The second section focuses on queries related to enabling factors, while the third section delves into questions concerning need factors.

Data Analysis Procedure

The data collected through the questionnaires were input into a computer system. Subsequently, the Statistical Package for Social Sciences (SPSS version 21) have been utilized for data analysis. This process encompassed data coding and cleaning. The findings have been visually presented through tables and graphs, featuring frequencies and percentages to convey the outcomes of descriptive analysis. Women who have completed at least four standard ANC visits were classified as having achieved the fourth standard ANC utilization, whereas those with fewer than four ANC visits wouldn't fall under this category.

To examine the relationship between independent and dependent variables, a bi-variate analysis was conducted employing the chi-square test. Furthermore, a multivariate regression analysis was performed to explore the connections between multiple independent variables and the dependent variable. Adjusted odds ratios have been calculated, with a confidence interval of 95%, and a p-value less than or equal to 0.05 was deemed statistically significant.

RESULTS

According to the table 1, the majority of respondents (52.0%) are between 21-30 years old, followed by those aged 31-40 (33.5%). Most respondents (66.3%) have primary education, with a significant portion (21.9%) having secondary education. A substantial majority of respondents (80.3%) are farmers. The predominant religion is Catholicism (62.5%). Most respondents are married (77.9%). Similar to the respondents, most husbands have primary education (54.1%). The majority of respondents consider themselves poor (55.8%), with a

significant portion identifying as rich (30.9%). Nearly all respondents (98.3%) have insurance coverage. Respondents are distributed across several regions, with significant concentrations in Ruli (25.9%) and Muhondo (16.4%). The majority of respondents live in village settings (85.5%). In sum, the data indicates that the majority of respondents are young adults (21-30 years old), primarily engaged in farming, with a primary education level. Most are married, and a significant number identified as poor. The predominant religion is Catholicism, and nearly all respondents have insurance. Household sizes are mostly moderate (4-6 members), and most respondents live in village settings.

Table 1: Sociodemographic Characteristics (Predisposing Factors) of the Respondents

Variable	Frequency	Percentage
Age		
16-20 years	31	7.4
21-30 years old	219	52.0
31-40 years old	141	33.5
41-50 years old	30	7.1
Total	**421**	**100.0**
The level of education		
Uneducated	34	8.1
Primary	279	66.3
Secondary	92	21.9
University	16	3.8
Total	**421**	**100.0**
The daily occupation		
Housewife	21	5.0
Farmer	338	80.3
Businesswoman	19	4.5
Employed	25	5.9
unemployed	18	4.3
Total	**421**	**100.0**
Religion		
Catholics	263	62.5
7th day Adventist	53	12.6
Protestant	93	22.1
Muslim	2	.5
Others	10	2.4
Total	**421**	**100.0**
The marital status		
Single	82	19.5
Married	328	77.9
Widow	4	1.0
Divorced	7	1.7
Total	**421**	**100.0**
Husband education level		
Uneducated	39	9.3
Primary education	228	54.1
Secondary education	56	13.3
University Education	15	3.6
NA	83	19.7
Total	**420**	**99.8**
The socioeconomic class		
Very poor	46	10.9
Poor	235	55.8
Rich	130	30.9
Very rich	1	.2
No category	9	2.1
Total	**421**	**100.0**
Insurance		
Yes	414	98.3
No	7	1.7
Total	**421**	**100.0**
Household Size		
1-3	129	30.6
4-6	253	60.1
>6	39	9.3
Total	**421**	**100.0**
Residence		
Coko	38	9.0
Minazi	55	13.1
Muhondo	69	16.4
Muyongwe	38	9.0
Nyange	30	7.1
Ruli	109	25.9
Rushashi	32	7.6
Rwankuba	45	10.7
Other placeS	5	1.2
Total	**421**	**100.0**
Residence Setting		
Center	61	14.5
Village	360	85.5
Total	**421**	**100.0**

Source: Primary Data (2023-2024)

According to Figure 1 below, 57.5% of the respondents attended 4 standard ANC utilization and above while 42.5% of them attended less than 4standard ANC visits. This shows that the prevalence of the 4th ANC standard utilization in RULI DH catchment area is 57.5%.

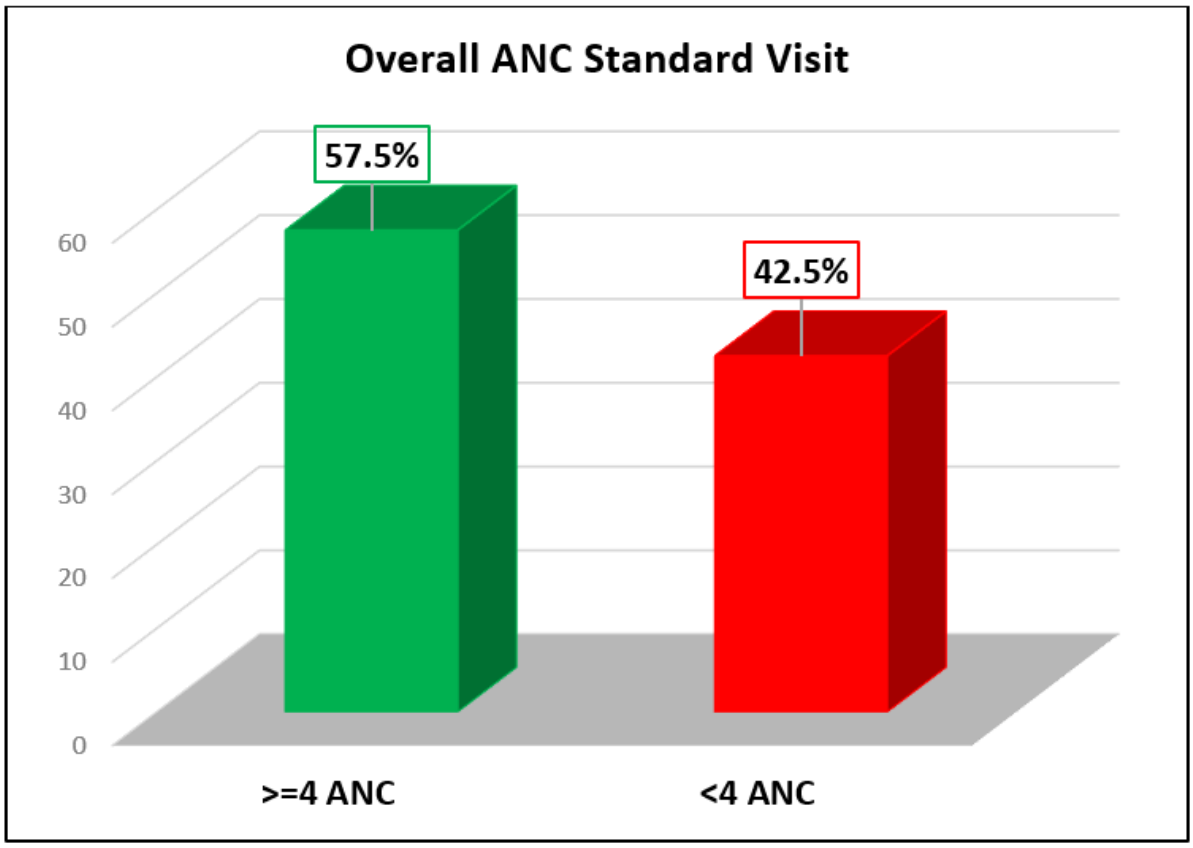

Figure 1: Prevalence of the Fourth ANC Standard Utilization

Table 2 provides a breakdown of the respondents' completion of four standard Antenatal Care (ANC) visits based on various sociodemographic factors, using Chi-square tests to determine the statistical significance of the associations. There is a significant association between education level and completion of ANC visits, with higher education associated with higher completion rates (Chi-square = 10.195, P-value = 0.017); Significant association between husband's education level and completion of ANC visits, with higher education associated with higher completion rates (Chi-square = 23.611, P-value = 0.001). In sum, the level of education (both respondents and their husbands) significantly influences the utilization of four standard ANC, with higher education levels associated with higher completion rates. However, age group, daily occupation, religion, marital status, socioeconomic class, possession of health insurance, and residence (both specific location and general setting) do not show a significant association with the utilization of the fourth standard ANC.

Table 2: Bivariate Analysis of Socio-Demographic Characteristics Associated With the 4th Standard Antenatal Care Utilization

	Fourth standard ANC utilization			Chi-square	P-value
	Yes n(%)	No n(%)	Total(%)		
Age group				0.053	0.997
16-20 years	13(3.1)	18(4.3)	31(7.4)		
21-30 years old	94(22.3)	125(29.7)	219(52.0)		
31-40 years old	59(14.0)	82(19.5)	141(33.5)		
41-50 years old	13(3.1)	17(4.0)	30(7.1)		
Total	179(42.5)	242(57.5)	421(100.0)		
The level of education				10.195	0.017
No school	18(4.3)	16(3.8)	34(8.1)		
Primary	128(30.4)	151(35.9)	279(66.3)		
Secondary	30(7.1)	62(14.7)	92(21.9)		
University	3(0.7)	13(3.1)	16(3.8)		
The daily occupation				2.772	0.597
Housewife	9(2.1)	12(2.9)	21(5.0)		
Farmer	145(34.4)	193(45.8)	338(80.3)		
Busines woman	9(2.1)	10(2.4)	19(4.5)		
Employed	7(1.7)	18(4.3)	25(5.9)		
unemployed	9(2.1)	9(2.1)	18(4.3)		
The religion affiliation of the respondent				1.563	0.815
7th day Adventist	112(26.6)	151(35.9)	263(62.5)		
Protestant	19(4.5)	34(8.1)	53(12.6)		
Muslim	43(10.2)	50(11.9)	93(22.1)		
Others	4(1.0)	6(1.4)	10(2.4)		
The marital status of the respondent				3.971	0.262
Single	42(10.0)	40(9.5)	82(19.5)		
Married	134(31.8)	194(46.1)	328(77.9)		
widow	1(0.2)	3(0.7)	4(1.0)		
Divorced	2(0.5)	5(1.2)	7(1.7)		
Husband's education level				23.611	0.001
Uneducated	22(5.2)	17(4.0)	39(9.3)		
Primary education	82(19.5)	145(34.5)	227(54.0)		
Secondary education	18(4.3)	38(9.0)	56(13.3)		
University Education	5(1.2)	10(2.4)	15(3.6)		
The socioeconomic class of the respondents				1.079	0.898
very poor	19(4.5)	27(6.4)	46(10.9)		
poor	98(23.3)	137(32.5)	235(55.8)		
rich	58(13.8)	72(17.1)	130(30.9)		
very rich	0(0)	1(0.2)	1(0.2)		
no category	4(1.0)	5(1.2)	9(2.1)		
The possession of health insurance				0.566	0.452
Yes	177(42.0)	237(56.3)	414(98.3)		
No	2(0.5)	5(1.2)	7(1.7)		
Residence of respondent				7.226	0.512
Coko	14(3.3)	24(5.7)	38(9.0)		
Minazi	21(5.0)	34(8.1)	55(13.1)		
Muhondo	32(7.6)	37(8.8)	69(16.4)		
Muyongwe	12(2.9)	26(6.2)	38(9.0)		
Nyange	12(2.9)	18(4.3)	30(7.1)		
Ruli	45(10.7)	64(15.2)	109(25.9)		
Rushashi	16(3.8)	16(3.8)	32(7.6)		
Rwankuba	25(5.9)	20(4.8)	45(10.7)		
Other place	2(0.5)	3(0.7)	5(1.2)		
Place of residence				0.089	0.766
Center	27(6.4)	34(8.1)	61(14.5)		
Village	152(36.1)	208(49.4)	360(85.5)		

Source: Researcher, 2024

Table 3 presents a bivariate analysis of predisposing factors with the utilization of the fourth standard antenatal (ANC) among respondents. The analysis includes Chi-square tests to assess the statistical significance of associations between these factors and the 4standard ANC utilization. There is a significant association between maternal alcohol consumption and the utilization of 4 standard ANC, with non-drinkers more likely to complete the visits (Chi-square = 17.403, P-value = 0.001). Similarly, there is a significant association between husbands' alcohol consumption and the utilization of the 4th standard ANC, with husbands who do not drink more likely to have partners who complete the visits (Chi-square = 27.852, P-value = 0.001). in sum, maternal alcohol consumption and husbands' alcohol consumption are significantly associated with the completion of four standard ANC visits. Mothers who do not consume alcohol and those whose husbands do not consume alcohol are more likely to complete the ANC visits. However, consulting traditional or prayer healers, the number of pregnancies, the number of live children, and the presence of pregnancy-related complications do not show a significant association with the completion of ANC visits.

Table 3: Bivariate Analysis of Predisposing Factors Associated With the 4th Standard Antenatal Care Utilization

	Fourth standard ANC utilization			Chi-square	P-value
	Yes n(%)	No n(%)	Total(%)		
Consumption of alcohol for Mothers				17.403	**0.001**
Yes	79(18.8)	60(14.3)	139(33.0)		
No	100((23.8)	182(43.2)	282(67.0)		
Alcohol consumption by the respondent's husbands				27.852	**0.001**
Yes	103(24.5)	135(32.1)	238(56.5)		
No	24(5.7)	76(18.1)	100(23.8)		
Consultation of traditional healer about this pregnancy or during previous pregnancy				0.120	0.729
Yes	41(9.7)	52(12.4)	93(22.1)		
No	138(32.8)	190(45.1)	328(77.9)		
Consultation of prayers healer during this pregnancy or during previous pregnancy				0.014	0.907
Yes	56(13.3)	77(18.3)	133(31.6)		
No	123(29.2)	165(39.2)	288(68.4)		
The number of respondent's pregnancies				2.025	0.363
1 pregnancy	138932.8)	196(46.6)	334(79.3)		
2 pregnancies	39(9.3)	41(9.7)	80(19.0)		
3 pregnancies and more	2(0.5)	5(1.2)	7(1.7)		
The number of respondent's live children				3.435	0.180
1 child	154(36.6)	210(49.9)	364(86.5)		
2 children	25(5.9)	28(6.7)	53(12.6)		
3 children and more	0(0)	4(1.0)	4(1.0)		
Pregnancy-related complications during or in the previous pregnancy				1.378	0.241
Yes	52(12.4)	58(13.8)	110(26.1)		
No	127(30.2)	184(43.7)	311(73.9)		

Source: Researcher, 2024

Table 4 presents a bivariate analysis of enabling factors on utilization of the fourth standard antenatal care (ANC). The analysis reveals that spousal accompaniment and pregnancy planning are strongly associated with higher completion rates. Specifically, women whose husbands accompany them to health facilities are significantly more likely to utilize their 4 standard ANC, with a Chi-square value of 19.240 and a P-value of 0.001. Similarly, women who planned their pregnancies are more likely to complete their 4 standard ANC visits, as indicated by a Chi-square value of 45.826 and a P-value of 0.001.

The findings showed that maltreatment by a husband during pregnancy significantly reduces the completion rate of 4 standard ANC visits, with a Chi-square value of 52.385 and a P-value of 0.001. These findings highlight the critical role of spousal support, the absence of domestic abuse, and proactive pregnancy planning in ensuring adherence to ANC schedules.

Table 4: Bivariate Analysis of Enabling Factors with the 4th Standard Antenatal Care Utilization

	Fourth standard ANC utilization			Chi-square	P-value
	Yesn(%)	No n(%)	Total (%)		
Healthcare decision participation				1.856	0.173
Yes	172(40.9)	225(53.4)	397(94.3)		
No	7(1.7)	17(4.0)	24(5.7)		
Accompaniment of the respondents' husband to health facility to get antenatal care				19.240	**0.001**
Yes	109(25.9)	189(44.9)	298(70.8)		
No	20(4.8)	25(5.9)	45(10.7)		
Maltreatment of the respondents by their husbands during current pregnancy				52.385	**0.001**
Yes	31(7.4)	13(3.1)	44(10.5)		
No	77(18.3)	187(44.4)	264(62.7)		
N/A	71(16.9)	42(10.0)	113(26.8)		
The time used to walk to near health center				2.323	0.508
less than 30 Min	47(11.2)	71(16.9)	118(28.0)		
30-60 Min	74(17.6)	84(20.0)	158(37.5)		
1-2 hours	50(11.9)	78(18.5)	128(30.4)		
above 2 hours	8(1.9)	9(2.1)	17(4.0)		
Planification of this pregnancy				45.826	**0.001**
Yes	99(23.5)	206(48.9)	305(72.4)		
No	80(19.0)	36(8.6)	116(27.6)		

Source: Researcher, 2024

Table 5 presents a bivariate analysis of need factors with the utilization of fourth standard antenatal care (ANC) among respondents. The analysis includes Chi-square tests to assess the statistical significance of associations between these factors and the utilization of the 4th standard ANC. There is a significant association between accompaniment of the respondents' husband to health facility to get antenatal care and the utilization of the 4th standard ANC, with those accompanied more likely to complete the visits (Chi-square = 19.240, P-value = 0.001).

Similarly, there is a significant association between maltreatment of the respondents by their husbands during current pregnancy and the utilization of the 4th standard ANC, with those who are not maltreated more likely to complete the visits (Chi-square = 53.385, P-value = 0.001). Also, there is a significant association between the planification of the pregnancy and the utilization of the 4th standard ANC, with those who have planned for the pregnancy more likely to utilize the 4th standard ANC (Chi-square = 45.826, P-value = 0.001).

Table 5: Bivariate Analysis of Need Factors Associated With the 4th Standard Antenatal Care Utilization

	Fourth standard ANC utilization			Chi-square	P-value
	Yes n(%)	No n(%)	Total(%)		
Know ANC necessity for mother and baby				8.288	**0.016**
Yes	170(40.4)	237(56.3)	407(96.7)		
No	3(0.7)	5(1.2)	8(1.9)		
Don't Know	6(1.4)	0(0)	6(1.4)		
Knowledge about the good time (in weeks) to start first antenatal care during pregnancy				8.657	0.070
within first 12 weeks	143(34.0)	213(50.6)	356(84.6)		
13-20 weeks	16(3.8)	16(3.8)	38(7.6)		
21-32 weeks	0(0)	1(0.2)	1(0.2)		
33 weeks and above	1(0.2)	2(0.5)	3(0.7)		
Don't know	19(4.5)	10(2.4)	29(6.9)		
Knowledge about the number of contacts a pregnant woman is expected to attend at health centre during pregnancy				10.975	0.052
Don't know	13(3.1)	5(1.2)	18(4.3)		
One contact	2(0.5)	2(0.5)	4(1.0)		
Two contacts	7(1.7)	4(1.0)	11(2.6)		
Three contacts	1(0.2)	3(0.7)	4(1.0)		
Four contacts	125(29.7)	193(45.8)	318(75.5)		
Eight contacts	31(7.4)	35(8.3)	66(15.7)		
Perception about quality of antenatal care provided at health facility				2.867	0.580
very bad	3(0.7)	1(0.2)	4(1.0)		
bad	1(0.2)	3(0.7)	4(1.0)		
neutral	35(8.3)	41(9.7)	76(18.1)		
good	92(21.9)	133(31.6)	225(53.4)		
very good	48(11.4)	64(15.2)	112(26.6)		
Knowledge of number of visits				0.833	0.361
Know that <4 visits	10(2.4)	9(2.1)	19(4.5)		
Know that >=4 visits	169(40.1)	233(55.3)	402(95.5)		

Source: Primary Data (2023-2024)

Multivariate Analysis of Factors Associated with the 4th ANC Standard Utilization

Through multivariate analysis, the study revealed that many characteristics were not significantly associated with the fourth standard ANC utilization, a finding consistent with the

bivariate analysis. Conversely, factors with a P value <0.05 were identified as influencing the utilization of the fourth standard ANC. Specifically, higher educational attainment was linked to increased attendance at the fourth ANC standard visit. Furthermore, the study demonstrated that abstaining from alcohol consumption by both the mother and husband, (AOR=1.953, CI: 1.202-3.174, P<0.007); (AOR=2.041, CI: 1.112-3.747, P<0.02), planned pregnancy (AOR=4.159, CI: 1.975-10.326, P<0.001), and absence of women mistreatment (AOR=3.040, 95% CI: 1.367-6.762, P=0.006) were associated with adherence to high standard ANC visits.

Table 6: Multivariate Analysis of Factors Associated With the 4th Standard Antenatal Care Utilization

Variables	Fourth standard ANC utilization		P-value
	AoR	95%CI	
Alcohol intake mother			
Yes	Ref		
No	1.953	1.202-3.174	**0.007**
Alcohol intake Husband			
Yes	Ref		
No	2.041	1.112-3.747	**0.02**
Mother education			
Uneducated	Ref		
Primary	1.255	0.534-2.948	0.6
Secondary	1.962	0.761-5.063	0.1
University	6.390	1.262-32.339	**0.02**
Planned pregnancy			
No	Ref		
Yes	4.159	1.975-10.326	**<0.001**
Women Mistreatment			
Yes	Ref		
No	3.040	1.367-6.762	**0.006**

Source: Primary Data (2023-2024)

Limitations

Despite its valuable insights, this study has several limitations that need to be acknowledged. One key limitation is the reliance on self-reported data for variables such as alcohol consumption, which may be subject to social desirability bias or inaccurate reporting. Participants might under report their alcohol consumption due to the stigma associated with drinking during pregnancy, potentially skewing the results. Furthermore, the cross-sectional design of the study limits the ability to infer causal relationships between the sociodemographic factors and the completion of ANC visits. Longitudinal studies would be more effective in establishing causality and understanding how these associations evolve over time. Additionally, the study's findings may not be generalizable to all populations, as cultural, socioeconomic, and healthcare system differences could influence the observed associations. Future research should aim to replicate these findings in diverse settings and consider incorporating qualitative methods to gain deeper insights into the barriers and facilitators of ANC visit completion.

Implications

The findings from this study have several important implications for public health policies and interventions aimed at improving maternal health outcomes. Firstly, the significant association between education levels (both maternal and paternal) and the completion of four ANC visits

underscores the necessity of promoting educational opportunities for both women and men. Policies that support women's education, as well as public health campaigns that emphasize the importance of male involvement in maternal health, could enhance the utilization of antenatal care services. Additionally, the strong correlation between alcohol abstinence and higher rates of ANC visit completion suggests that public health interventions should include educational components about the adverse effects of alcohol consumption on pregnancy outcomes. These interventions could be integrated into existing ANC programs to reach expectant mothers and their partners more effectively, potentially improving compliance with recommended ANC visits and overall maternal health outcomes.

Conclusion

This study concluded that 57.5% of the respondent had attended four and more antenatal care visit during their pregnancy, which means that the prevalence of the fourth antenatal care standard utilization among pregnant women attending Ruli District Hospital catchment area is 57.5%. Additionally, the study's findings underscore the critical factors influencing adherence to antenatal care guidelines among pregnant women. Abstinence from alcohol by both the mother and her husband, higher maternal education levels, planned pregnancies, and the absence of mistreatment towards women were identified as significant predictors of achieving four or more antenatal care visits. These findings highlight the importance of supportive familial environments, educational empowerment, and societal attitudes towards women's health in promoting maternal healthcare utilization. Addressing these factors through targeted public health interventions could improve maternal and neonatal health outcomes by encouraging timely and comprehensive prenatal care.

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