

Prevalence of Utilization of the First Antenatal Service Visit among Pregnant Females of Reproductive Age Attending Nduba Health Center in Gasabo District, Rwanda

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Abstract

Limited utilization of the first antenatal care visit remains a major challenge in controlling maternal mortality rate among pregnant women of reproductive age due to obstetric emergencies, globally, regionally and locally in Rwanda. However, information on the utilization of first antenatal services in Gasabo district remains undocumented, thus the need to study the factors influencing to increased first antenatal care visits to reduce obstetric emergencies among pregnant women of reproductive age attending the health center in Gasabo district. Specifically, determining the prevalence of the utilization of the first antenatal services visit among pregnant females of reproductive age, and to evaluate the health education influencing the utilization of first antenatal services visit to reduce obstetric emergencies among pregnant women of reproductive age at Nduba Health Center in Gasabo district. This study intended to promote the utilization of the first antenatal services visit to reduce obstetric emergency complications in Gasabo district. The study was mixed and used an approach of survey, interviews employing a semi-structured questionnaire, an interview guide and focus group discussion guides. Study design was descriptive, cross-sectional, cohort as well as triangulation design. Sampling techniques were purposive, prospective, and retrospective using a rapid retrospective form and discussion of themes and subthemes. Data was managed by SSP 26 and analyzed by cross tabulation, and inferential statistics presented by figures. The results on age distribution of respondents felt that many pregnant female of the reproductive age were in the 25–29 years' age group 136 (31.6%), and age above 35 years 45 (10.4%) with influencing significant of P values 0.034 and 95% CI 1.8, marital status, opined that majority of respondents were married 331 (77.2%), while only 13 (2.8%) were widowed or separated with overall significant first antenatal care visit of P values 0.043. The prevalence of the utilization of the first antenatal services to reduce obstetric complications in the study area is 236 (54.9%) at their first antenatal services visit before 12 weeks of gestation. The result opined that the majority of women of reproductive age received health information on the importance of first antenatal care visit and tests, 198 (68.5%) to reduce obstetric complications during and after pregnancy. Only a few did not receive the health information, 38 (29.2%), with a significant contribution of chi-square 26.74, and P values of 0.023, utilization of First antenatal services. In conclusion, early ANC utilization is determined by quality health education.

Keywords: First antenatal service, First clinic, obstetric complications, Health education. Prevalence

1.1 Introduction and Background

Antenatal care (ANC) is a critical maternal health intervention that enables early detection and management of pregnancy-related complications, thereby reducing maternal and neonatal morbidity and mortality (World Health Organization [WHO], 2023). Despite global progress, maternal mortality remains high, particularly in low- and middle-income countries, with Sub-Saharan Africa accounting for the majority of preventable maternal deaths (WHO, 2023). Delayed initiation of the first ANC visit continues to be a major challenge due to socioeconomic, cultural, and health system barriers (Ahinkorah et al., 2021; Mutowo et al., 2021; Nkoka et al., 2020).

In Rwanda, significant improvements in maternal health have been achieved; however, timely utilization of ANC services remains inadequate (National Institute of Statistics of Rwanda [NISR], 2021). Although ANC coverage is relatively high, many pregnant women initiate care after the first trimester and fail to complete the recommended ANC contacts (Ngango et al., 2022). Factors such as limited knowledge, financial constraints, poor accessibility, cultural beliefs, and low male partner involvement contribute to delayed ANC attendance (Bamporiki et al., 2022; Tadele et al., 2021).

Gasabo District, despite its comparatively better access to healthcare services, continues to experience gaps in early ANC utilization, exposing pregnant women to preventable obstetric complications (NISR, 2021). Furthermore, limited evidence exists regarding factors influencing first ANC attendance at the health-center level within the district (Uwimana et al., 2023). Therefore, this study aimed to determine the prevalence of first ANC utilization and assess factors, particularly healthcare accessibility, influencing timely attendance among pregnant women of reproductive age attending health centers in Gasabo District, Rwanda.

Focused Antenatal Care (FANC) emphasizes early and timely initiation of antenatal services to identify pregnancy-related complications and reduce maternal and neonatal morbidity and mortality. The first ANC visit, preferably within the first trimester of pregnancy, provides an opportunity for risk assessment, health education, disease prevention, and timely management of obstetric complications. Timely utilization of the first ANC visit has been associated with reduced risks of hypertensive disorders, hemorrhage, sepsis, and other obstetric emergencies (World Health Organization [WHO], 2023; Sserwanja et al., 2022).

Globally, utilization of antenatal care services has improved over recent decades; however, early initiation of ANC remains suboptimal in many low- and middle-income countries. Sub-Saharan Africa continues to experience low rates of timely ANC attendance due to socioeconomic, cultural, and health-system barriers. Delayed initiation limits the effectiveness of interventions designed to prevent pregnancy complications and adverse maternal outcomes (Uwizeye et al., 2024; WHO, 2023).

2.0 Material and Methods

2.1.0 Material

2.1.1 Prevalence of First Antenatal Visit Service Utilization to Reduce Obstetric Complications

First antenatal visit form critical component of maternal healthcare that aims to monitor pregnancy, detect complications early, and provide preventive interventions. Globally, progress has been made in improving access to the first antenatal visit; however, significant gaps remain in the timing and adequacy of the visit. According to recent global estimates, approximately 87% of pregnant women attend at least one ANC visit during pregnancy. Despite this relatively high initial contact with health services, only about 70% of women complete the recommended minimum of four ANC visit, which remains below the global target

of 90%. Moreover, a smaller percentage of women initiate ANC during the first trimester that was considered pertinent for early detection and management of pregnancy-related challenges (UNICEF, 2024; Benova et al., 2018).

The early initiation of first antenatal visit was particularly important because it enables healthcare providers to identify risk factors, provide counseling, and implement preventive measures such as nutritional supplementation, vaccination, and screening for infections. Nevertheless, evidence from many less developed countries indicates that a large proportion of women initiate ANC later than recommended. In sub-Saharan Africa, a study revealed that fewer than 40% of pregnant women begin ANC during the first trimester highlighting persistent delays in accessing maternal health services (Ritbano Abdo et al., 2023). These delays reduce opportunities for on time detection and management of pregnancy related burden and contribute to higher maternal morbidity as well as mortality.

In Rwanda, national surveys indicate relatively high coverage for at least one ANC visit, reflecting improvements in maternal healthcare access over the past decade. However, timely initiation and completion of the recommended number of visit remain below international targets. Reports from National Institute of Statistics of Rwanda show that while most women attend at least one first antenatal visit, fewer initiate care during the first trimester or complete the suggested number of visit (NISR, 2021; Hakizimana et al., 2024). Facility-based studies conducted in Kigali and other parts of the country also demonstrate similar patterns, with high first-contact rates but lower adherence to recommended visit schedules (Twagirumukiza et al., 2024; Kubahoniyesu et al., 2023).

Pregnancy outcomes are often classified into several categories, including ongoing pregnancies, previous pregnancies, recovered outcomes, and maternal deaths associated with complications. Evidence suggests that delayed ANC initiation is strongly associated with adverse maternal outcomes due to late identification of conditions such as anemia, hypertension, infections, and other pregnancy-related complications. Consequently, assessing the prevalence and timing of the first antenatal care visit was essential for identifying gaps in maternal healthcare utilization and for developing interventions aimed at improving maternal health outcomes

2.1.2 Health Education on First Antenatal Services to Reduce Obstetric Complications

Health education plays a crucial importance in shaping maternal health attitudes and improving the use of ANC services. Evidence from multiple studies indicates that health education interventions significantly improve women's KAP associated with pregnancy as well as maternal healthcare (Tessema *et al.*, 2021). Through counseling sessions, community outreach programs, and mass media campaigns, health education initiatives aim to increase understanding of the role of early ANC and encourage pregnant women to attend recommended visits.

Community health workers are particularly important in delivering maternal health education at the community level. In developing countries, community health workers service as a bridge between healthcare facilities and local communities. Their activities include identifying pregnant women, providing health education, promoting early first antenatal visit attendance, and referring women to health facilities when necessary.

In Rwanda, the community health worker system has been widely recognized as a successful approach to ameliorate maternal and child health outcomes. Previous research has demonstrated that community-based health education programs and group first antenatal visit models have increased women's knowledge about pregnancy and improved attendance at the first antenatal visit (Patil et al., 2017; Theresa Norpeli

Lanyo et al., 2024). Women who participate in these programs are more likely to understand pregnancy danger signs and to seek healthcare services early.

However, several studies have highlighted challenges related to the effectiveness of health education interventions. Poor quality counseling, misinformation, and cultural beliefs surrounding pregnancy may limit the impact of health education programs. For example, in some community's women delay disclosing pregnancy during the early stages due to social stigma or cultural norms, which may result in delayed first antenatal visit initiation (Phoebe Miller et al., 2021). Therefore, assessing the quality, content, and reach of health education interventions is essential for understanding their role in improving antenatal care utilization

2.2 Conceptual framework

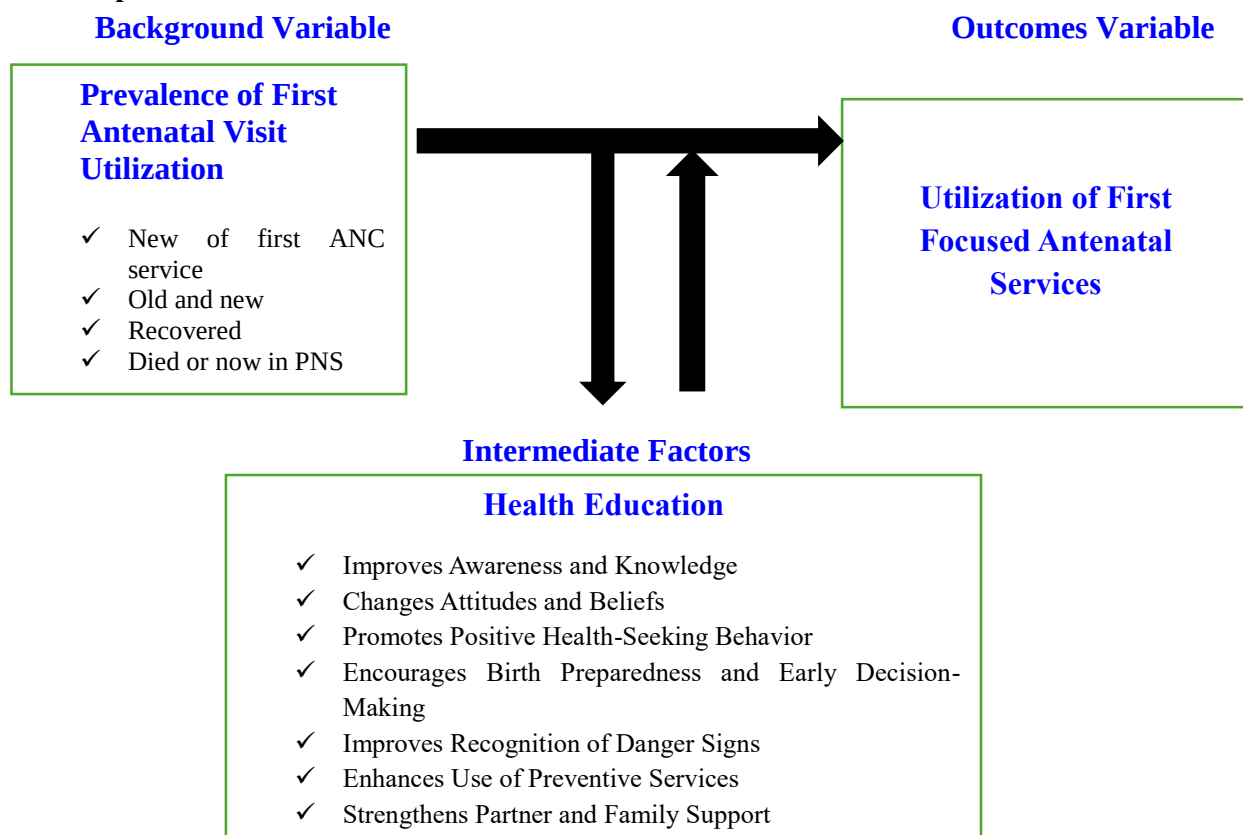


Figure 2.1 Conceptual frame works Source Silali (2026)

3.0 Methods and Methodology

3.1 Research Design

A descriptive cross-sectional design formed the core of the research providing a snapshot of FANC utilization, accessibility, socioeconomic determinants, and exposure to health education among women of reproductive age. This design allowed for quantifying the percentage of women initiating their first antenatal visit on time and identifying key factors influencing timely attendance.

To enhance the temporal perspective, a cohort element was incorporated through retrospective review of ANC registers from the preceding 12 months. This provided trends in early ANC attendance, validated self-reported data, and strengthened the reliability of prevalence estimates.

Additionally, a triangulated mixed-methods approach was employed, combining structured questionnaires, interview guide, as well as focus group discussions. This design enabled merging of quantitative and qualitative data offering both statistical evidence and experiential insights into barriers, facilitators, and contextual dynamics affecting first antenatal care (ANC) visit.

3.2 Location of the Study

This research was carried out at Nduba health center, located in Gasabo district, Kigali Rwanda. Gasabo district is one of the three districts of Kigali City. According to the 2022 Rwandan census, the population of Gasabo district was 920,426 and it is the most populous district in Rwanda. Nduba Health Center provide antenatal services including consultation, laboratory, antenatal vaccination, and ambulance. The population from Gasabo district was characterized by sociodemographic including, age group, gender, education, employment status, marital status as well as religion.

3.3 Target Population

This study targeted pregnant women of reproductive age (15–49 years) attending antenatal care services at Nduba Health Center in Gasabo District, Kigali, Rwanda. The population included pregnant women at different gestational stages seeking maternal healthcare services during the study period. These women represented different socioeconomic backgrounds, educational levels, occupations, and parity categories to enable examination of factors influencing utilization of the first antenatal care visit.

The study also involved key informants responsible for maternal healthcare delivery and community maternal health support to provide qualitative insights regarding barriers and facilitators affecting utilization of first antenatal care services.

The target population was categorized into quantitative and qualitative populations as shown below:

The accessible quantitative population consisted of 9,500 pregnant women recorded in ANC registers for the most recent reporting period available at Nduba Health Center.

3.4 Inclusion Criteria

The study included pregnant women aged 15–49 years attending antenatal care (ANC) services at Nduba Health Center during the data collection period, including those attending either their first or subsequent ANC visits, provided they were willing to participate and give informed consent. It also included healthcare providers and maternal health personnel who were directly involved in the delivery of ANC services, as well as Community Health Workers engaged in maternal and child health programs.

3.5 Exclusion Criteria

The study excluded pregnant women who were critically ill during the data collection period, as well as those who were not residing within the study catchment area. It also excluded women who were unwilling to participate or who withdrew consent, health personnel who were not directly involved in antenatal care (ANC) service delivery, and participants who provided incomplete responses.

3.6 Sampling Techniques and Sample Size

A mixed sampling strategy was employed. For quantitative data, simple random sampling was used to select pregnant women attending ANC services. For qualitative data, purposive sampling was used to select participants with direct knowledge and experience regarding the utilization of the first antenatal services.

3.7 Sample Size

Since the population was known ($N = 9,500$), Cochran's formula with finite population correction was applied.

$$n_0 = \frac{Z^2 p(1-p)}{d^2}$$

n_0 =required sample size (initial)

Z=z-score for desired confidence level (1.96 for 95% CI)

p=estimated proportion (use 0.5 for Maximum variability when unknown)

d= desired margin of error (precision), commonly 0.05 (5%)

Using $Z = 1.96$, $p = 0.5$, $d = 0.05$:

$$n_0 = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = \frac{3.8416 \times 0.25}{0.0025} = \frac{0.9604}{0.0025} = 384.16$$

The total number of respondents were around 385.

Adjustment for non-response (10% assumed)

Non-response adjusted $n = \frac{n_0}{1-r}$, where r = expected non-response rate (0.10):

$$n = \frac{385}{0.90} \approx 430$$

After adjustment the total number of respondents was **430 as the sample size**.

3.8 Sampling Technique

For quantitative data, respondents were selected using simple random sampling from ANC attendance registers. For qualitative data, purposive sampling was employed to select information-rich participants, including healthcare providers, CHWs, and pregnant women with relevant ANC experience.

This sampling approach enabled collection of both representative quantitative findings and in-depth qualitative insights regarding factors influencing utilization of the first antenatal care visit.

3.9 Data Collection Instrument

Information are gathered using a combination of semi-structured questionnaires, interview, focus group discussions, and a rapid retrospective review form. The semi-structured questionnaire comprised six sections: (1) sociodemographic characteristics, (2) obstetric history, (3) knowledge, attitudes, and practices (KAP) on ANC (adapted from Bashir, Abdul, & Arshiya, 2023), (4) awareness of pregnancy complications, (5) services utilized at the health center, and (6) guides for key informant interviews and FGDs. The retrospective review form captured trends in first antenatal care visit over the previous 12 months. These instruments were designed to collect mixed data.

3.10 Piloting of Research Instrument

Prior to the main study, the instruments were reviewed by public health and maternal health specialists to accept content relevance, clarity, and comprehensiveness. The study was undertaken with 30 pregnant women at Kicukiro Health Center to test clarity, comprehension, and applicability. The reliability was assessed utilizing Cronbach's Alpha with a threshold of 0.7, demonstrating internal consistency. Feedback from a pre-test led to refinements of the instruments to improve accuracy and ensure alignment with research objectives.

3.11 Reliability, Validity, and Establishment of Truthfulness

The reliability and validity were ensured through expert review, pilot testing, and methodological checks. The content validity was assessed by linking items with study objectives, while construct validity was examined using factor analysis. Internal validity was supported by piloting the questionnaire to optimize data capture. Test-retest procedures evaluated reliability, with repeated administration after one week confirming consistent responses. Multiple data sources including FGDs, key informant interviews, and retrospective records were triangulated to enhance credibility and confirm the trustworthiness of results.

3.12 Data Collection Methods and Procedure

The data collection was conducted over a three-week period. Approval was first obtained from Gasabo District authorities and Nduba Health Center administration. Informed consent was secured from respondents before engaging in this research. Information are gathered utilizing face to face interviews with semi-structured questionnaires, complemented by a review of retrospective ANC records with assistance from healthcare providers. All responses and records were carefully checked for completeness, accuracy, and consistency before being prepared for analysis. This systematic approach ensured reliable and high-quality data for this study.

3.13 Data Management and Analysis and Techniques and Presentation

The quantitative information was managed by employing Microsoft Excel and statistic package for the Social Sciences version 26 analyzed by descriptive as well as inferential statistics, descriptive included frequencies, percentages, means, as well as standard deviation, recapped respondents' sociodemographic features accessibility, socioeconomic status, and health education. Moreover, inferential statistics, such as chi-square tests and logistic regression, were applied to examine associations between use of first antenatal care (ANC) visit and influencing factors. Results are presentation utilizing tables, graphs as well as charts to facilitate clear interpretation and comparison.

3.13.1 Access to Sites

Gaining entry into the selected study sites required the researcher to formally approach the respective institutional authorities. This process involved presenting an official introduction, supported by ethical approval documentation and an authorization letter issued by Mount Kigali University, to seek permission for conducting the study within the targeted institutions.

3.13.2 Informed Consent

Participation in the study was entirely voluntary, and no individual was compelled to take part or respond to questions that made them uncomfortable. The researcher ensured that participants were free to share information at their own discretion and respected their decision to withhold any sensitive details. Before data collection, clear explanations were provided regarding the study's purpose, procedures, as well as any potential risks and benefits involved. Participants were also informed of their right to withdraw from the study at any stage without any consequences. To formalize their willingness to participate, each respondent was required to read, understand, and sign an informed consent form before engaging in the research process.

3.13.3 Confidentiality and Privacy

The researcher assured all participants that the information they provided would be treated with strict confidentiality and used solely for this study. To promote openness and honest responses, no identifying details such as names or residential information were recorded on the data collection instruments. In addition, a coding system known only to the researcher was employed to manage and protect the data, thereby safeguarding participants' identities and ensuring their privacy throughout the research process.

3.13.4 Anonymity

Participants were not required to disclose their identities when completing the data collection instruments, ensuring that their responses remained anonymous. Instead, the researcher assigned unique codes to categorize and manage participant information. No personal details were revealed in written reports, verbal discussions, or any other form of communication related to the study. This approach helped to protect participants' identities and encouraged unbiased and honest responses throughout the research process.

3.13.5 Intellectual Ownership and Plagiarism

To uphold academic integrity and ensure originality, the researcher subjected the thesis to plagiarism screening using the Turnitin system prior to each defense stage. The similarity index was maintained at or below 15%, inclusive of referenced materials. In instances where the similarity score exceeded the acceptable threshold, the document was carefully revised and resubmitted for further checking. The final plagiarism report was then appended to the completed research document as evidence of compliance with academic standards.

3.13.6 Voluntary Participation

Participants were clearly informed that their involvement in the study was entirely voluntary and that they had the right to decline participation at any stage. They were encouraged to provide information freely, without any form of pressure, coercion, or inducement, ensuring that their responses reflected genuine willingness and consent.

3.13.7 Storage of Data Collected

All data obtained from participants were handled with a high level of confidentiality to prevent access by unauthorized individuals. The raw data were systematically organized and securely stored to allow for easy retrieval when necessary. Electronic copies were protected through encryption, while printed versions of analyzed data were safely archived. Digital storage devices were also used to preserve soft copies of the processed information. Access to the data was strictly limited to the researcher, who remained solely responsible for its management and use.

These measures were implemented in accordance with the Law No. 058/2021 Relating to the Protection of Personal Data and Privacy, which requires data controllers and processors to adopt appropriate technical and organizational safeguards to protect personal information against loss, damage, or unauthorized disclosure. The law further emphasizes the need for enhanced protection of sensitive data through strategies such as encryption, pseudonymization, or secure separation from other data sets.

3.13.8 Mien and Decorum

The researcher maintained a professional appearance and demonstrated appropriate behavior when interacting with participants throughout the study. Respectful communication, good conduct, and adherence to socially accepted norms were consistently observed before, during, and after engagement with respondents. In addition, the researcher upheld ethical standards and professional codes of conduct expected within the research environment, ensuring a respectful and trustworthy relationship with all participants.

3.11 Ethical Consideration

The thesis was approved by the school of postgraduate, Mount Kenya University. The ethical approval was gotten from Mount Kenya University Ethical Review Committee and Remera HC (which stands for MOH) after fully reviewing and finding out that all ethical concerns have been addressed.

4.1 Demographic Profile

The results on age distribution of respondents demonstrated that many pregnant women are between 25 and 29 years' age group 136 (31.6%), and the age attending FANS and the age was women reproductive age above 35 years 45 (10.4%) with influencing significant of P values 0.034 and 95% CI 1.88. These findings suggest that most respondents were within the peak reproductive age, a group that is generally more likely to recognize pregnancy early and seek maternal health services.

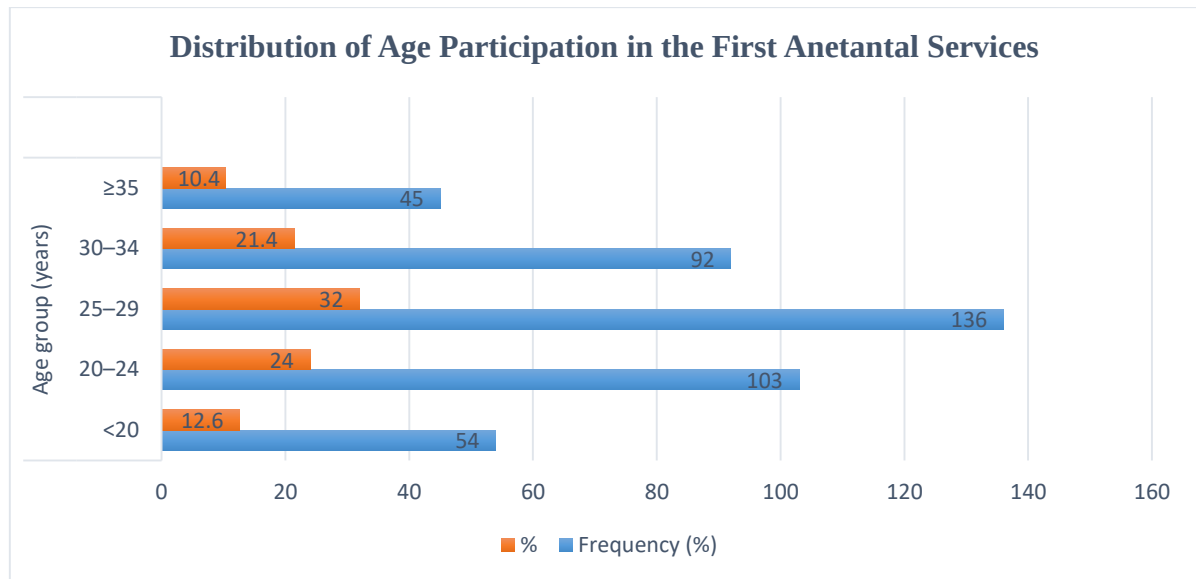


Figure 4. 1 Distribution of Age Participation in the First Antenatal Services

Result on marital status, opined that majority of respondents were married 331 (77.2%), while only 13 (2.8%) were widowed or separated with overall significant first antenatal care visit of P values 0.043.

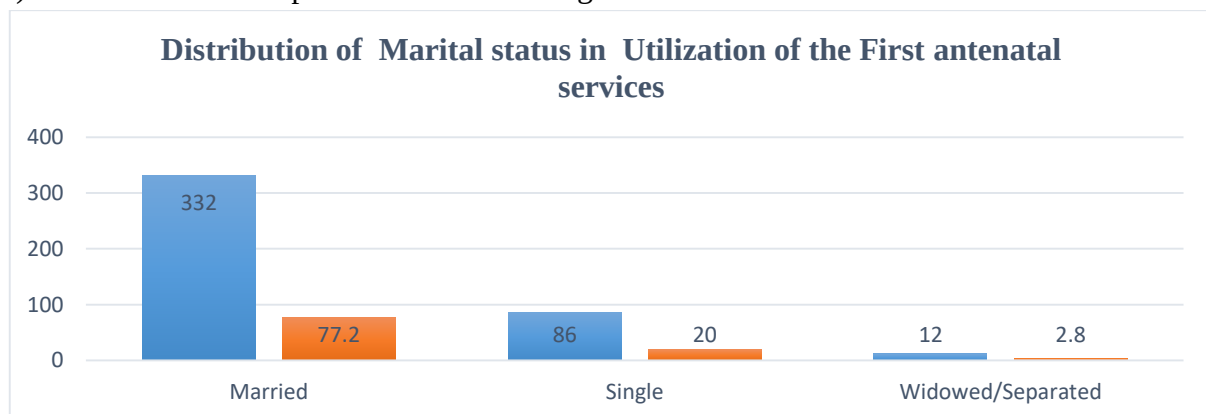


Figure 4. 2 Distribution of Marital Status in Utilization of First Antenatal Services

Result on the Occupational status showed that the majority, 187 (43.5%) of respondents were self-employed, while only 101 (23.5%) were unemployed. The unemployed had insignificant contribution to first antenatal visit due to financial transport cost that limited to access the services which was also discussed during KII:

“Lack of employment among unemployed women contributes to financial constraints, further limiting their ability to access transport or cover indirect costs associated with health facility visit”. KII held at health center on 23/12/2025

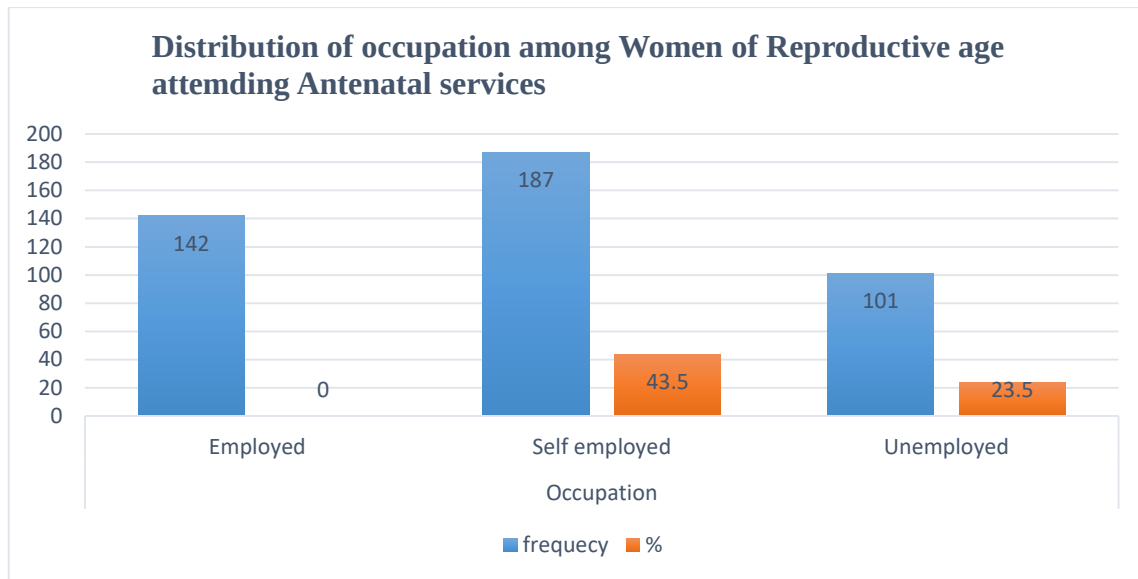


Figure 4. 3 Distribution of occupation among females of reproductive age attending Antenatal services

4.2 Prevalence of Utilization of First Antenatal Care Visit

The results opined the prevalence of the utilization of the first antenatal services to reduce obstetric complication in the study area is 236 (54.9%) at their first ANC visit before 12 weeks of gestation, Early start of ANC allows for timely identification of pregnancy-related risks, provision of essential preventive interventions such as iron and folic acid supplementation, tetanus vaccination as well as early detection to reduce obstetric emergencies. This was also echoed during FGD discussion with pregnant women of reproductive age who had visited the clinic:

“Since enlightening pregnant women on the importance of going first clinic by our community health workers to prevent going to theatre, because obstetric complications, nowadays most us ones get pregnant we tell each other to come Nduba health center for free checkup of these obstetric complications because we do not pay money” FGD held on 21/12/2025.

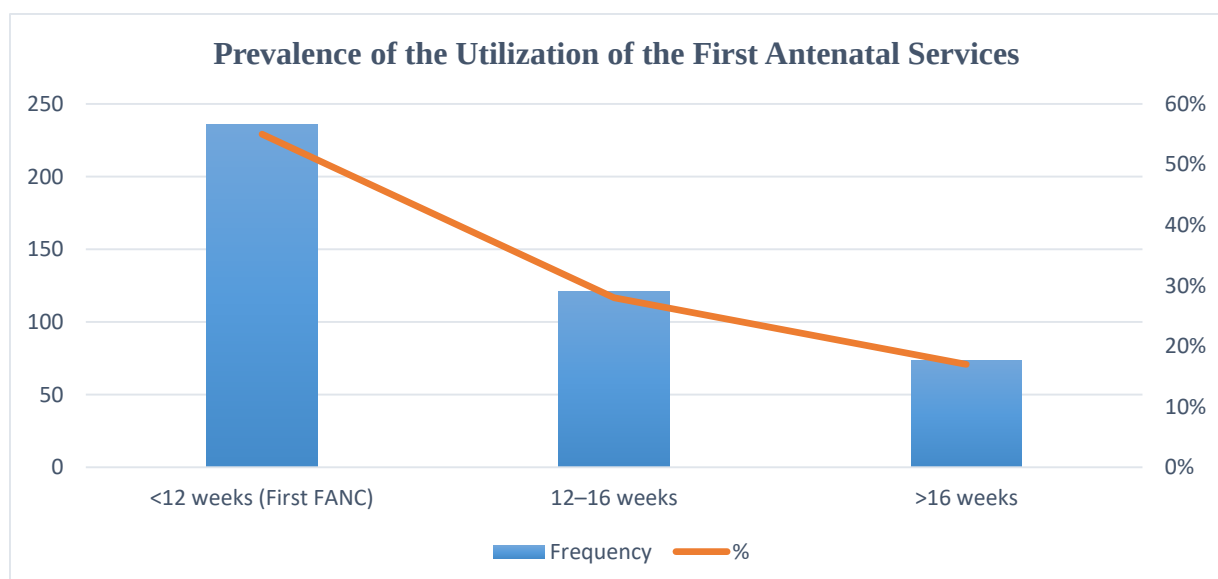


Figure 4. 4 Prevalence of the Utilization of the First Antenatal Services

4.5 Health Education and Utilization of First Antenatal Care Visit

Findings opined that the majority of women of reproductive age received health information on the importance of the first antenatal care visit and tests, 198 (68.5%) to reduce obstetric complications during and after pregnancy. Only a few did not receive the health information 38 (29.2%), with a significant contribution of chi-square 26.74, and P values of 0.023, utilization of First antenatal services. Which was also discussed in a FGD discussion:

. “Women who understood the benefits of early ANC and the potential risks of delaying care expressed greater motivation to book their first visit as soon as pregnancy was confirmed”. CHWs as trusted sources of maternal health information. Health care providers emphasized that regular household visits, community sensitization sessions, and early pregnancy identification by CHWs contribute fully to the connection for pregnant women to health facilities for the first antenatal services visit. KII held 2012/2025.

“In Several FGD participants noted that learning about obstetric emergencies during community meetings or previous pregnancies made them more proactive in seeking care during the first trimester” FGD held on 20/12/25.

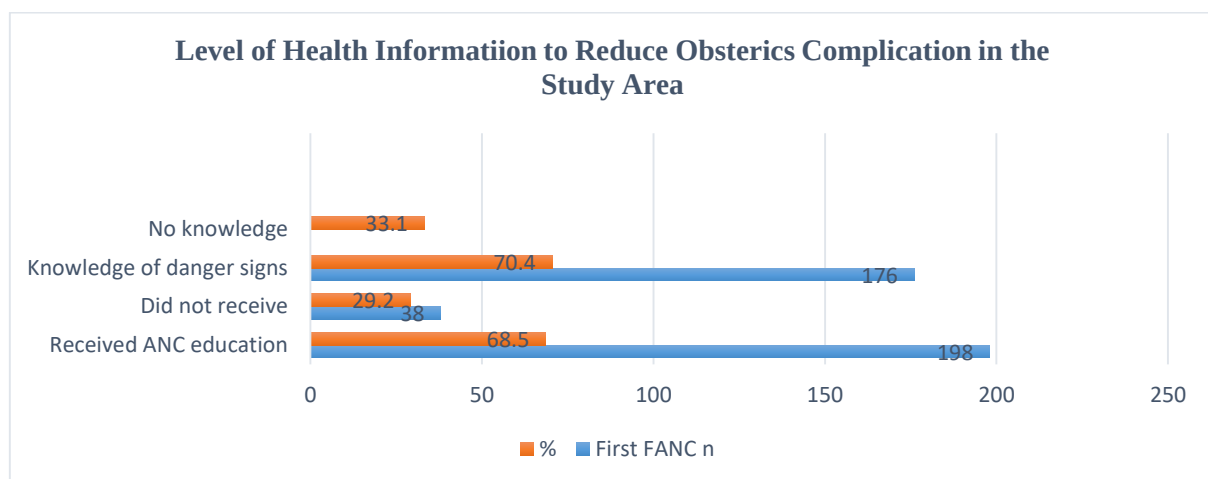


Figure 4. 1 Level of Health information to Reduce Obstetric Complications in the Study area

5.0 Conclusion

This study concludes that utilization of the first antenatal care visit among pregnant women attending Nduba Health Center remains moderate, with slightly more than half initiating ANC within the recommended first trimester.

The study established that accessibility factors significantly influence utilization. Distance to facilities, transport costs, and waiting time continue to create barriers to timely maternal healthcare.

Socioeconomic conditions also play an important role. Women with employment opportunities and health insurance coverage demonstrated greater likelihood of utilizing ANC services.

Health education emerged as the most influential and modifiable determinant. Women who received maternal health information were more likely to recognize pregnancy risks and initiate ANC early.

Triangulated evidence from quantitative and qualitative findings demonstrated that improving first ANC utilization requires coordinated interventions addressing informational, structural, and socioeconomic barriers simultaneously.

5.1 Acknowledgments

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