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Original Article

Utilization of first trimester obstetric scans among pregnant mothers at Dr. Bata general military hospital, Wakiso district. A cross-sectional study.

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Abstract

Background.

First-trimester obstetric ultrasound scanning is a critical component of antenatal care, enabling accurate dating of pregnancy, early detection of complications, and improved maternal and fetal outcomes. This study assessed the utilization of first-trimester obstetric scans and the associated factors among pregnant mothers attending Dr. Bata General Military Hospital, Wakiso District.

Methodology.

A descriptive cross-sectional study was conducted among 50 pregnant mothers attending antenatal care at Dr. Bata General Military Hospital. Data were collected using structured questionnaires and analyzed using descriptive statistics, including frequencies and percentages.

Results.

The majority of respondents were aged 20–30 years (62%), had secondary education (48%), were self-employed (58%), and married (68%). Socio-economic factors showed that 56% were sometimes able to manage scan costs, 60% belonged to households with medium economic status, and 64% lived 2–4 km from the hospital. Transport was reported as difficult or very difficult by 60% of respondents. Most respondents (66%) had received information on first-trimester scans, mainly from health workers (67%), and 58% had moderate knowledge of scan purposes. Although 60% demonstrated a positive attitude toward first-trimester scans, 56% reported previous negative scan experiences, and 62% indicated that personal beliefs somewhat influenced their attitudes. Health facility challenges included long or very long waiting times (74%), intermittent availability of ultrasound machines (60%), and reported challenges in accessing scan services by 58% of respondents, despite 56% perceiving staffing as adequate.

Conclusion.

Utilization of first-trimester obstetric scans was influenced by economic constraints, transport difficulties, knowledge gaps, prior negative experiences, and health facility limitations such as long waiting times and inconsistent equipment availability.

Recommendations.

Health facilities should strengthen health education on the importance of first-trimester scans, improve service efficiency to reduce waiting times, ensure consistent availability of ultrasound machines, and consider cost-reduction or support mechanisms.

Keywords: *First Trimester Obstetric Scans, Ultrasound Utilization, Antenatal Care Services, Pregnant Mothers, Dr. Bata General Military Hospital, Wakiso District.*
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Background.

The utilisation of first-trimester obstetric scans refers to the extent to which pregnant mothers receive ultrasound examination within the first 13 weeks of pregnancy. These early scans help confirm pregnancy viability, estimate gestational age, determine fetal number, and identify early abnormalities. According to Jabehdar Maralani et al. (2022), early ultrasound is a key component of antenatal care because it guides timely and informed clinical decisions. First-trimester scans contribute to better maternal and newborn outcomes by enabling early detection of complications and supporting quick medical interventions. Globally, the use of early scans has increased to about 45%, although misuse and unnecessary repeat scans remain common in many countries (Volpe et al., 2022). In Mexico, 41.8% of pregnant women undergo first-trimester scans mainly for non-medical reasons such as fetal sex determination (Cardona-Pérez et al., 2021). Similar trends

have been seen in Canada, where 29% of women received more than one early scan without medical justification (Jabehdar Maralani et al., 2022).

In Sub-Saharan Africa, pooled prevalence estimates indicate that 36% of pregnant mothers undergo first-trimester scans for non-medical reasons, with factors such as community pressure, uncertainty about fetal well-being, and mistrust in provider interpretation contributing to the trend (Gomani et al., 2025). Studies in Nigeria found that 37% of mothers sought early scans mainly for fetal sex determination despite guidelines discouraging this practice (Abdo et al., 2023). In Zambia, 33% of women underwent duplicate scans due to inconsistent interpretation among different ultrasound providers (Gwaba et al., 2023). These variations reflect structural and communication gaps within the health system that may influence both misuse and underuse of early ultrasound services.

In East Africa, the use of first-trimester scans continues to rise, though misuse and unnecessary repeat scans remain prominent, with a prevalence of about 30% (Bergström et al., 2024). In Kenya, 29% of pregnant women had more than one early scan due to conflicting results or the perception that multiple scans improve pregnancy outcomes (Warugongo, 2021). In Tanzania, 32% accessed scans for reassurance even when there was no clinical indication (Bergström et al., 2024).

In Uganda, studies show that approximately 30% of pregnant mothers utilise early scans without medical justification, driven largely by maternal anxiety, peer pressure, and availability of private ultrasound services (Maniragena et al., 2021). In Kampala, 27% of mothers pressured providers to conduct early scans even when unnecessary, while in Wakiso, 25% accessed duplicate scans at both public and private facilities (Mulowooza et al., 2021), highlighting demand-driven misuse within communities. These gaps in both knowledge and service delivery highlight the need to understand what shapes mothers' scan-seeking behaviour. Based on this, this study assessed the utilization of first-trimester obstetric scans and the associated factors among pregnant mothers attending Dr. Bata General Military Hospital, Wakiso District.

Methodology.

Study design.

The study employed a descriptive cross-sectional analysis utilizing quantitative research methodologies. It was appropriate to use questionnaires to obtain information from a variety of people.

Study setting.

The study was conducted at Dr. Bata General Military Hospital, a private not-for-profit facility located in Entebbe Municipality, Wakiso District, about 36 kilometers southwest of Kampala, Uganda's capital city. The hospital served as a referral center for peri-urban and rural communities within and around Entebbe and offered diverse services, including maternal and child health, antenatal and postnatal care, immunization, family planning, internal medicine, pediatrics, and general surgery. Study participants were recruited from the Antenatal Care (ANC) Unit under the Maternal and Child Health Department. The unit provided routine first-trimester, second-trimester, and third-trimester obstetric scans, health education, counseling, and laboratory investigations. On average, it attended to 25–40 pregnant women daily and was staffed by qualified midwives, nurses, and sonographers.

The ANC unit was selected because it served as the primary point of contact for pregnant mothers and was where first-trimester obstetric scans were recommended and routinely performed. The hospital's strategic location, broad catchment area, and strong maternal health services made it an appropriate setting for exploring the factors influencing utilization of first-trimester obstetric scans among pregnant women.

Study Population.

The study focused on pregnant mothers attending antenatal care (ANC) services at Dr. Bata General Military Hospital, Entebbe, Wakiso District. This group was selected because utilization of first-trimester obstetric scans is a critical determinant of early detection and management of pregnancy-related complications. However, many women-initiated scans are late due to socio-economic, cultural, and health system barriers.

Sample Size Determination.

To determine a scientifically appropriate sample size, Yamane's (1967) formula for finite populations was used:

Where n was the sample size, N=120 is the population of women attending family planning services, and e=0.05 is the desired level of precision. Substituting these values:

$$n = \frac{120}{1 + 120(0.05)^2} = \frac{120}{1.3} \approx 92$$

The computed Sample size was 92 respondents.

However, in line with the Uganda Health Professionals Examinations Board (UHPAB) research guidelines, diploma-level studies are required to use a manageable sample of 30 to 60 participants for field-based quantitative studies. The final sample size for this study was therefore **50** pregnant mothers attending antenatal care (ANC) services at Dr. Bata General Military Hospital, Entebbe, Wakiso District.

Sampling Procedure.

A convenience sampling technique was employed to select participants for the study. Pregnant mothers who met the inclusion criteria and attended the Antenatal Care (ANC) Unit at Dr. Bata General Military Hospital during the data

collection period were conveniently recruited. Participants were approached consecutively as they came for antenatal visits, and those who consented to participate were included until the required sample size was attained. This approach was appropriate because it allowed easy access to participants who were readily available and willing to take part in the study. The method also ensured efficient data collection within the limited study period while maintaining ethical and voluntary participation.

Inclusion Criteria.

The study included pregnant mothers who met specific eligibility requirements to ensure that the findings accurately reflected the utilization of first-trimester obstetric scans. Eligible participants were Ugandan women aged 18 to 45 years who were attending antenatal care services at Dr. Bata General Military Hospital during the data collection period. Participants were required to be in their first trimester of pregnancy (up to 12 weeks of gestation) and residents of Entebbe Municipality or surrounding communities within the hospital's catchment area. Only mothers who voluntarily provided written informed consent were recruited into the study.

Study Variables.

Dependent Variable.

Utilisation of first-trimester obstetric scans among pregnant mothers at Dr. Bata General Military Hospital. This variable measured whether pregnant mothers underwent obstetric scans within the first 12 weeks of pregnancy.

Independent Variables:

Socio-economic factors: education level, household income, marital status, and employment status.
Individual factors: awareness of the importance of early scans, cultural beliefs, attitudes towards ANC, and previous obstetric history.
Health facility-related factors: accessibility of services, cost of scans, availability of functional ultrasound machines, staff attitudes, and waiting time at the facility.

Research Instrument.

The study employed a structured questionnaire as the primary tool for data collection, consisting mainly of closed-ended questions designed to assess pregnant mothers' experiences and the factors influencing their utilization of first-trimester obstetric scans. The questionnaire was developed in English and translated into Luganda to enhance comprehension. To ensure reliability, the tool was pilot tested at Kigorobya Health Centre IV in Hoima District with a small group of pregnant mothers who were not included in the main study, and feedback from the pretest was used to refine the tool. The questionnaire covered four main areas: socio-economic factors such as education, occupation, and income; individual factors including knowledge, beliefs, and attitudes; health facility-related factors such as service availability, cost, and accessibility; and utilization of first-trimester scans focusing on timing, frequency, and reasons for use or non-use.

Data Collection Procedure.

Data collection was carried out over a scheduled period until the required sample size was attained. Pregnant mothers attending ANC at Dr. Bata General Military Hospital who met the inclusion criteria completed structured questionnaires. The researcher reviewed completed questionnaires on-site to ensure accuracy and completeness. For mothers unable to read or write in English, the questionnaire was administered orally in Luganda by the researcher, who recorded their responses. Informed consent was obtained from all participants before participation. This approach ensured inclusivity, consistency, and adherence to ethical standards.

Data management, analysis, and presentation.

All completed questionnaires were collected daily, checked for completeness, and safely stored. Data were coded and backed up on a flash disk for security. The responses were tallied manually and then entered into SPSS for analysis. Data were summarized using descriptive statistics, with results presented in frequency tables, pie charts, and bar graphs generated by the program. These visual presentations provided clear insights into the factors influencing the utilization of first-trimester obstetric scans.

Quality assurance: validity and reliability

To ensure validity and reliability, several strategies were applied. Validity was enhanced by developing a structured questionnaire aligned with the study objectives and pretesting it at Kigorobya Health Centre IV to ensure it captured relevant factors accurately. The questionnaire was reviewed by research and maternal health experts to strengthen content and construct validity. Reliability was ensured through standardized procedures, including training research assistants on consistent administration of questionnaires and proper handling of responses. A pilot study was conducted to address ambiguities and refine the tool for clarity. Additionally, data were cross-checked daily for completeness and consistency to maintain quality. These measures ensured that the study produced credible and dependable findings for improving maternal health services.

Ethical Consideration.

To ensure ethical compliance, several measures were undertaken. Approval was first obtained from the research supervisor, and ethical clearance was sought from the Principal of Mildmay Uganda School of Health Sciences.

An introductory letter from the institution was presented to Dr. Bata General Military Hospital to facilitate access to the study site. Permission was also sought from the hospital administration before commencing data collection. The study's objectives and procedures were clearly explained to all potential participants, and participation was entirely voluntary. Participants were informed of their right to withdraw at any time without consequences. Confidentiality was safeguarded by assigning unique identifiers to each participant and securely storing all data to prevent unauthorized access. Written informed consent was obtained before data collection began. The researcher adhered strictly to ethical guidelines to maintain integrity and protect participants' rights throughout the study.

Results.

Socio-demographic characteristics of respondents.

Table 1 shows the socio-demographic characteristics of respondents

		n=50	
Characteristics	**Attributes**	**Frequency**	**Percentage**
Age group of respondents	Below 20 years	6	12
	20–30 years	31	62
	31–40 years	10	20
	Above 40 years	3	6
The highest level of education of the respondents	No formal education	5	10
	Primary	14	28
	Secondary	24	48
	Tertiary/College	7	14
Main occupation of respondents	Employed (formal)	10	20
	Self-employed	29	58
	Unemployed	7	14
	Student	4	8
	Single	11	22
Marital status of respondents	Married	34	68
	Widowed	3	6
	Divorced/Separated	2	4
	TOTAL	**50**	**100%**

Table 1 shows that the majority of respondents, 31 (62%), were aged between 20–30 years, while the minority, 3 (6%), were above 40 years. Regarding education level, most respondents, 24 (48%), had completed secondary education, whereas 5 (10%) had no formal education. In terms of occupation, the majority, 29 (58%), were self-employed, while the minority, 4 (8%), were students. Concerning marital status, most respondents, 34 (68%), were married, while only 2 (4%) were divorced or separated.

Socio-economic factors related factors influencing the utilization of first-trimester obstetric scans among pregnant mothers.

SJ Obstetrics and Gynecology Africa
Vol. 3 No. 2 (2026): February 2026 Issue
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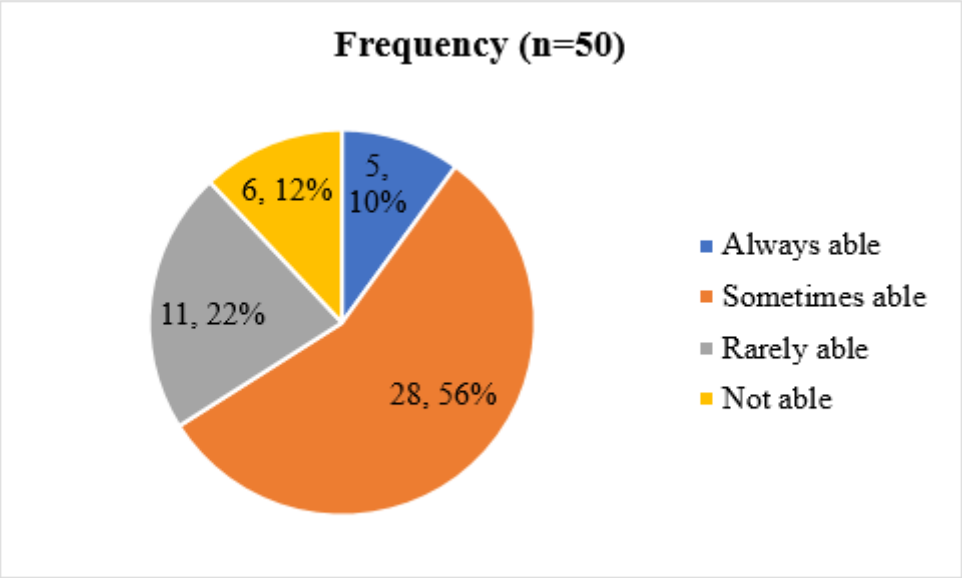
Original Article

Figure 1 Shows respondents' ability to manage scan costs.



Primary source

Figure 1 shows that the majority of respondents, 28 (56%), reported that they were sometimes able to manage scan costs, while the minority, 5 (10%), stated that they were always able to meet these costs. Additionally, 11 (22%) indicated they were rarely able to manage scan expenses, and 6 (12%) reported that they were not able to meet scan costs at all.

Table 2 shows household economic factors, family support, and distance to health facility among respondents.

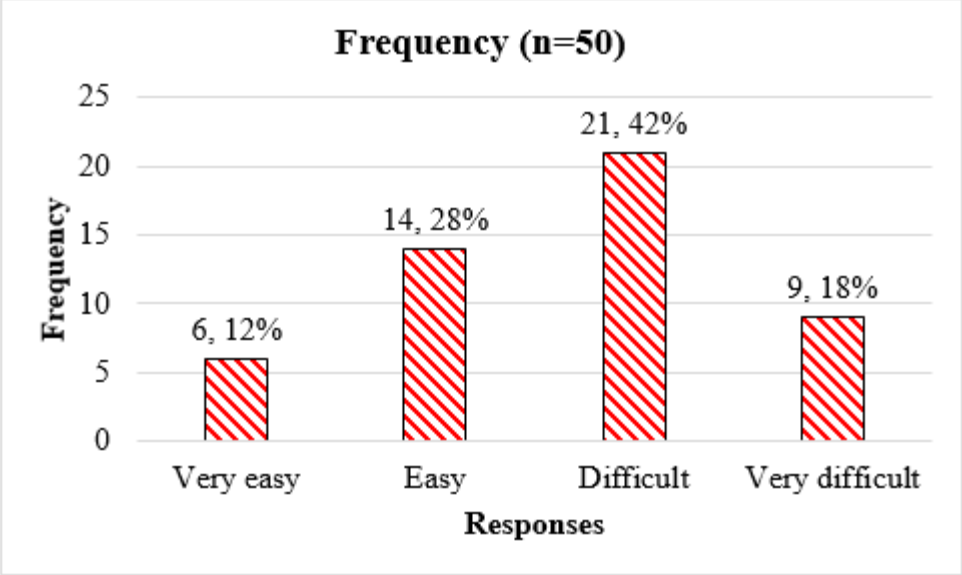
Characteristics	Attributes	Frequency	Percentage
Reveals the household economic status of respondents.	High	4	8
	Medium	30	60
	Low	16	32
	TOTAL	**50**	**100**
Reveals the level of family support respondents received for antenatal care	Strong support	14	28
	Moderate support	27	54
	Little support	6	12
	No support	3	6
	TOTAL	**50**	**100**
Reveals the distance respondents travelled to access the hospital.	< 2 km	9	18
	2–4 km	32	64
	5–10 km	7	14
	>10 km	2	4
	TOTAL	**50**	**100**

The table shows that the majority of respondents, 30 (60%), belonged to households with a medium economic status, while the minority, 4 (8%), were from households with a high economic status. Regarding family support for antenatal care, the majority, 27 (54%), reported receiving moderate support, whereas the minority, 3 (6%), indicated

https://doi.org/10.51168/2ng47q80
Original Article

having no support at all. Concerning distance to the hospital, the majority, 32 (64%), lived 2–4 km away, while the minority, 2 (4%), resided more than 10 km from the facility.

Figure 2 shows the ease of transport experienced by respondents when accessing the health facility



Primary Source

Figure 2 shows that the majority of respondents, 21 (42%), reported that transport was difficult, while the minority, 6 (12%), found it very easy. Additionally, 14 (28%) stated that transport was easy, and 9 (18%) reported it as very difficult.

Individual related factors influencing utilisation of first-trimester obstetric scans among pregnant mothers.

SJ Obstetrics and Gynecology Africa
Vol. 3 No. 2 (2026): February 2026 Issue
https://doi.org/10.51168/2ng47q80
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Figure 3 Shows whether respondents had ever received information on first-trimester scans

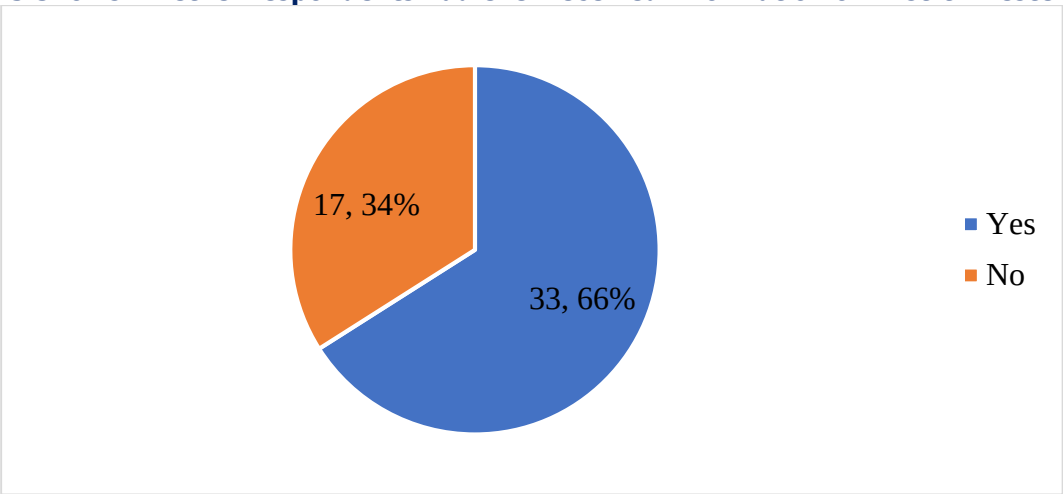

Figure 3 shows that the majority of respondents, 33 (66%), had received information on first-trimester scans, while the minority, 17 (34%), had not.

Table 3 shows the sources of information and knowledge levels about the purpose of the first-trimester scan

Characteristics	Attributes	Frequency	Percentage
Reveals respondents' sources of information on first-trimester scans (Among those who received information, n = 33)	Health worker	22	67
	Family/Friends	6	18
	Media	4	12
	Other	1	3
	TOTAL	33	100
Reveals respondents' level of knowledge about the purpose of the first-trimester scan	High	10	20
	Moderate	29	58
	Low	9	18
	No knowledge	2	4
	TOTAL	50	100

The table shows that among respondents who received information, the majority, 22 (67%), obtained it from health workers, while the minority, 1 (3%), received information from other sources. Regarding knowledge levels, the majority, 29 (58%), had moderate knowledge of the purpose of the first-trimester scan, whereas the minority, 2 (4%), reported not knowing.

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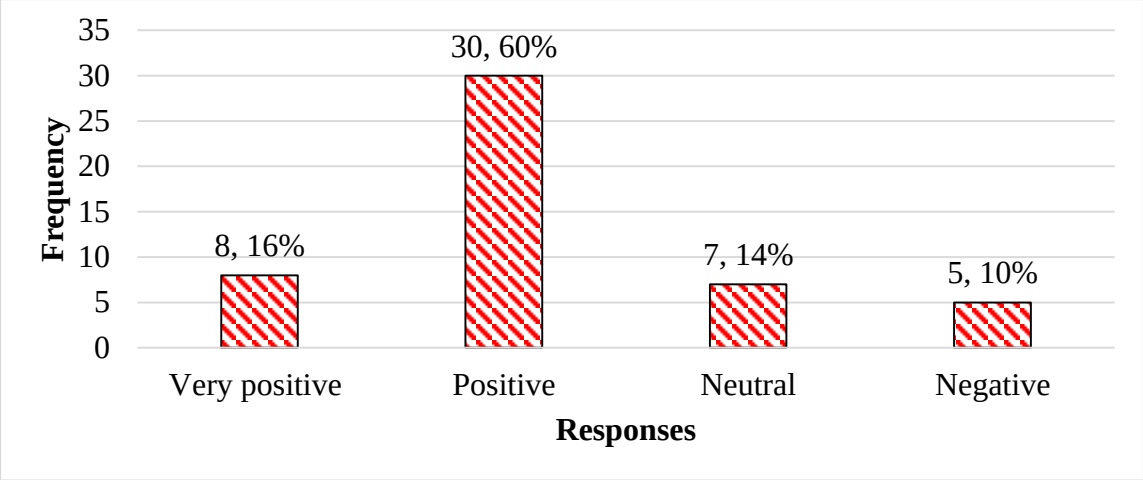
Figure 4 shows respondents' attitudes toward undergoing a first-trimester scan



The figure shows that the majority of respondents, 30 (60%), had a positive attitude toward the first-trimester scan, while the minority, 5 (10%), expressed a negative attitude. Additionally, 8 (16%) had a very positive attitude, and 7 (14%) reported a neutral attitude.

Table 4: Shows previous scan experiences and the influence of personal beliefs toward first-trimester scanning.

Characteristics	Attributes	Frequency	Percentage
Reveals respondents' previous scan experiences	Yes – Positive experience	6	12
	Yes – Negative experience	28	56
	No previous experience	16	32
	TOTAL	**50**	**100**
Reveals whether personal beliefs influenced attitudes toward the first-trimester scan	Yes, strongly	6	12
	Yes, somewhat	31	62
	No influence	13	26
	TOTAL	**50**	**100**

The results showed that the majority of respondents (56%) reported having a negative previous scan experience, while the minority (12%) indicated having a positive previous scan experience. Regarding the influence of personal beliefs on attitudes toward the first-trimester scan, the majority (62%) stated that their beliefs influenced them somewhat, whereas the minority (12%) reported that their beliefs strongly influenced their attitudes.

Health facility–related factors influencing utilization of first-trimester obstetric scans among pregnant mothers.

SJ Obstetrics and Gynecology Africa
Vol. 3 No. 2 (2026): February 2026 Issue
https://doi.org/10.51168/2ng47q80
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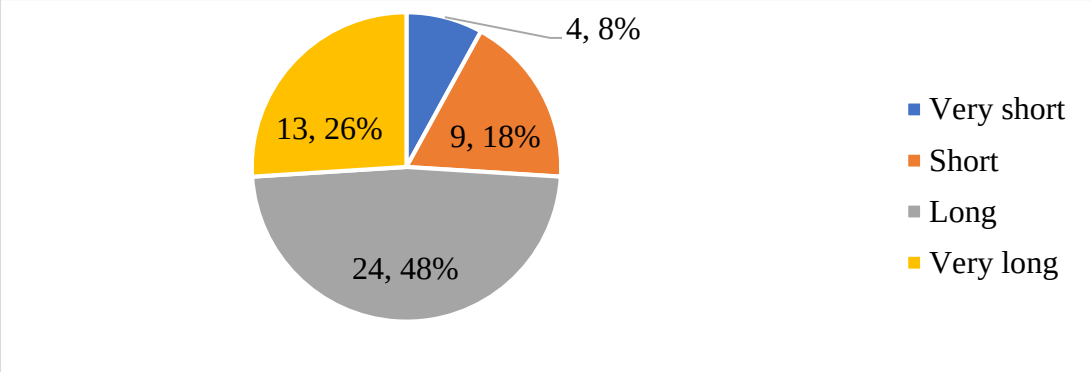
Figure 5 shows the waiting time experienced by respondents when accessing scan services



The figure shows that the majority of respondents, 24 (48%), experienced long waiting times when accessing scan services, while 13 (26%) reported very long waiting times. A smaller proportion, 9 (18%), indicated that the waiting time was short, and the minority, 4 (8%), stated that the waiting time was very short.

Table 5 shows the Cost of scan services and health worker treatment toward clients n=50

Characteristics	Attributes	Frequency	Percentage
Reveals the cost of scans	Affordable	12	24
	Fair	28	56
	Expensive	7	14
	Not sure	3	6
	TOTAL	**50**	**100**
Reveals respondents' experience with health worker treatment	Very supportive	9	18
	Supportive	29	58
	Neutral	7	14
	Unsupportive	5	10
	TOTAL	**50**	**100**

Table 5 shows that the majority of respondents, 28 (56%), perceived the cost of scans as fair, while the minority, 3 (6%), were not sure about the cost. Regarding health worker treatment, the majority, 29 (58%), reported that health workers were supportive, whereas the minority, 5 (10%), described them as unsupportive.

SJ Obstetrics and Gynecology Africa
Vol. 3 No. 2 (2026): February 2026 Issue
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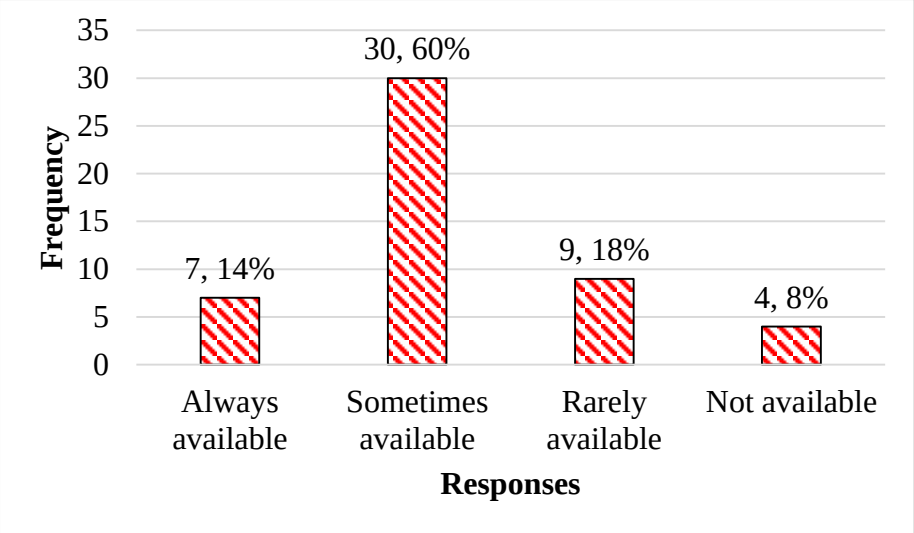
Original Article

Figure 6 shows the availability of ultrasound machines at the facility



The figure indicates that the majority of respondents, 30 (60%), reported that ultrasound machines were sometimes available, while the minority, 4 (8%), stated that the machines were not available. Additionally, 7 (14%) mentioned that the machines were always available, and 9 (18%) stated they were rarely available.

Table 6 Shows facility staffing adequacy and challenges in accessing scan services

Characteristics	Attributes	Frequency	Percentage
Reveals the adequacy of staff for ANC and scan services	Very adequate	5	10
	Adequate	28	56
	Inadequate	11	22
	Very inadequate	6	12
	TOTAL	**50**	**100**
Reveals whether respondents faced challenges in accessing scan services	Yes	29	58
	No	21	42
	TOTAL	**50**	**100**

Table 6 shows that the majority of respondents, 28 (56%), reported that staffing for antenatal care and scan services was adequate, while the minority, 5 (10%), indicated that it was very adequate. Additionally, 11 (22%) considered staffing inadequate, and 6 (12%) viewed it as very inadequate. Regarding challenges in obtaining scan services, the majority, 29 (58%), reported experiencing difficulties, whereas the minority, 21 (42%), stated that they did not encounter any challenges.

Discussion of results.

Socio-economic factors influencing utilization of first-trimester obstetric scans among pregnant mothers.

The purpose of the study was to find out the socioeconomic factors influencing the utilization of first-trimester obstetric scans among pregnant mothers. The study showed that most respondents (56%) reported that they were only sometimes able to manage the cost of first-trimester scans. This is a negative socio-economic factor because the inconsistent ability to afford scan costs discourages early utilization and can delay timely pregnancy assessment. The variation may be due to unstable income, competing family expenses, or lack of financial planning for ANC services. This aligns with Adams et al. (2022) in Toronto, who reported that only 49% of low-income pregnant women accessed early scans compared to 78% of high-income women, demonstrating that financial barriers significantly reduce early ultrasound uptake.

Most respondents (60%) belonged to households with a medium economic status. This is a positive socio-economic factor because moderate household income provides financial stability that supports access to first-trimester

scans when needed. The variation may arise from diverse income sources, seasonal employment, or partner support that contributes to a more stable economic environment. This aligns with Gashaw et al. (2025), who found that women in higher socio-economic groups were far more likely to utilize early scans (74%) than those in lower groups (36%), indicating that better economic status enhances scan uptake.

Most respondents (54%) reported receiving moderate family support for antenatal care. This is a positive socio-economic factor because family support—emotional, financial, or logistical—encourages mothers to attend ANC early and complete recommended scans. The variation may stem from cultural norms that encourage partner or family involvement in pregnancy care. This is consistent with Moncrieff et al. (2021), who found that 71% of women with family support attended early scans compared to only 39% without such support, showing that family support strongly influences early ANC utilization.

Most respondents (64%) lived within 2–4 km of the hospital. This is a positive socio-economic factor because shorter distances reduce transport barriers and make it easier for mothers to attend early scan appointments. The variation may reflect residential patterns near the health facility or routine use of nearby services. This aligns with Daniels (2021) in Cape Town, who found that 83% of urban women accessed early scans compared to only 44% in rural areas, demonstrating that proximity strongly improves early scan utilisation.

Most respondents (42%) reported that transport to the facility was difficult. This is a negative socio-economic factor because transport challenges can delay ANC attendance, making mothers less likely to utilise first-trimester scans. The variation may arise from poor road conditions, high transport costs, or limited vehicle availability. This aligns with evidence from Gashaw et al. (2025) and Daniels (2021), who both found that poor transport networks and long travel distances significantly reduced early scan utilisation among pregnant women. The findings of the study showed that the above socioeconomic factors influenced the utilisation of first-trimester obstetric scans among pregnant women.

Individual related factors influencing utilisation of first-trimester obstetric scans among pregnant mothers.

Most respondents (66%) had received information about first-trimester scans. This is a positive individual-related factor because access to accurate ANC information increases awareness and motivates mothers to seek early scans for the timely detection of complications. The variation may result from routine ANC health talks and strong midwife–mother communication. This aligns with Susu et al. (2025) in Ethiopia, who reported that lack of awareness led to poor utilisation of first-trimester scans, with only 42.6% of women demonstrating adequate awareness. This shows that adequate information is essential for improving early scan uptake.

Most respondents (67%) obtained their information from health workers. This is a positive factor because guidance from trained professionals strengthens knowledge accuracy and builds confidence in early scan services. The variation may stem from regular counselling sessions and the availability of qualified staff. This corresponds with Ali et al. (2021) in Uganda, who found that mothers who received information from health workers were more likely to utilise ultrasound services early, while those relying on the community were prone to myths and misconceptions.

Most respondents (62%) stated that personal beliefs influenced them somewhat. This is a negative individual-related factor because cultural beliefs and myths can create doubt, hesitation, or fear, weakening early scan utilisation. The variation may arise from community perceptions, partner influence, or weak maternal health education. This aligns with Ali et al. (2021) in Iganga, Uganda, where 36% of women avoided early scans due to myths such as ultrasound causing infertility or miscarriage. Similar findings by Hekmat et al. (2023) showed how fears and beliefs shaped scan avoidance in Iran.

Most respondents (58%) had moderate knowledge of the purpose of the first-trimester scan. This is a positive factor because a reasonable understanding encourages mothers to attend early scans for gestational age confirmation and early detection of complications. The variation may be due to previous scan exposure or continuous counselling. This aligns with Susu et al. (2025), who noted that women with adequate knowledge were nearly twice as likely to undergo early scans compared to those with limited knowledge, highlighting knowledge as a major determinant of utilisation.

Most respondents (60%) demonstrated a positive attitude toward first-trimester scans. This is a positive factor because favourable attitudes increase willingness to attend ANC early and reduce fear or hesitation toward scanning. The variation may stem from prior positive interactions with health workers or recognition of scan benefits. This corresponds with Mahore (n.d.), who found that positive attitudes improved early ANC uptake, whereas poor attitudes led to delays or non-utilisation of scans.

Most respondents (56%) reported having a negative previous scan experience. This is a negative individual-related factor because unpleasant past encounters discourage mothers from returning for early scans, reducing early detection of complications. The variation may stem from long waiting times, discomfort during procedures, or unfriendly providers. This aligns with Alex-Ojei et al. (2023) in Lagos, Nigeria, who reported that prior negative experiences—such as rude health workers and poor privacy—led 41% of women to avoid first-trimester scans

in subsequent pregnancies. Findings of the study showed that the above individual-related factors influenced utilisation of first-trimester obstetric scans among pregnant mothers.

Health facility-related factors influencing utilisation of first-trimester obstetric scans among pregnant mothers.

The study showed that most respondents (48%) experienced long waiting times for scan services. This is a negative health facility factor because long queues discourage mothers from seeking first-trimester scans and delay early pregnancy assessment. The variation might be due to understaffing or high patient load. This aligns with Warugongo (2021), who found that 63% of mothers at Kenyatta National Hospital waited more than two hours before being attended to, which reduced their willingness to return for subsequent ultrasound scans.

Most respondents (56%) perceived the cost of scans as fair. This is a positive factor because affordable charges enable more mothers to utilise first-trimester scans without financial strain. The variation may arise from subsidised fees or partner support. This contrasts with Roro et al. (2022), who reported that high ultrasound costs (54% of cases) were a major barrier in Ethiopian primary healthcare facilities, suggesting that where costs are fair—like in the current study—utilisation is likely to improve.

Most respondents (58%) reported supportive health workers. This is a positive factor because supportive provider behaviour builds trust and encourages mothers to attend early scans. The variation may stem from trained and respectful ANC staff. This supports findings by Tefera et al. (2024), who revealed that 46% of women avoided early scans due to poor provider attitudes, indicating that supportive interactions significantly improve scan utilisation.

Most respondents (60%) reported that ultrasound machines were only sometimes available. This is a negative factor because inconsistent equipment availability disrupts service continuity and may cause mothers to miss early scans. The variation might result from breakdowns or shared use of machines. This is consistent with Della Ripa et al. (2025), who found that only 38% of rural facilities in LMICs had functional machines, with frequent breakdowns limiting access to first-trimester ultrasound.

Most respondents (56%) reported that staffing for ANC and scan services was adequate. This is a positive factor because sufficient staffing reduces waiting time and improves service efficiency, increasing the likelihood of completing first-trimester scans. The variation may be due to well-allocated staff schedules. This contrasts with Lualua (2024), who found that 52% of Samoan health centres had only one or two providers performing scans, leading to service delays. Adequate staffing in the current study, therefore, promotes better utilisation. Findings of the study showed that the above health facility-related factors influenced utilisation of first-trimester obstetric scans among pregnant mothers.

Conclusion

This study assessed socio-economic, individual, and health facility factors influencing utilisation of first-trimester obstetric scans. The findings show that while many mothers had moderate education, access to information, and positive attitudes, financial constraints, transport difficulties, and negative past scan experiences limited early scan uptake. Supportive health workers and fair scan costs facilitated utilisation, but long waiting times and inconsistent ultrasound machine availability hindered timely access. Overall, both individual and facility-related barriers affected early scan use, indicating the need for strengthened health education, improved facility efficiency, and consistent availability of ultrasound services to enhance early scan utilisation among pregnant mothers.

Limitations

This study was limited by a small sample size from a single facility, reducing the generalizability of findings to other settings. The use of self-reported questionnaires may have introduced recall and social desirability bias. Some respondents had low education levels, which could have affected their understanding of certain questions.

Recommendations.

Strengthen maternal health education: MOH, hospital management, and health workers should enhance ANC health talks and community sensitization to improve awareness of the importance of first-trimester scans.

Enhance financial accessibility: MOH and the hospital should reduce cost barriers by subsidizing early scan services or integrating them into routine ANC packages.

Improve transport access for mothers: Local leaders and transport providers should collaborate to ensure reliable and affordable transport for pregnant women attending early ANC.

Reduce waiting times: Hospital management and staff should streamline patient flow, improve appointment systems, and increase staffing during peak hours to support timely scans.

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List of Acronyms

ANC: Antenatal Care
HMIS: Health Management Information System
MoH: Ministry of Health (Uganda)
PMF: Perinatal Medicine Foundation
UHPAB: Uganda Health Professional Assessment Board
UNMEB: Uganda Nurses and Midwives Examination Board
WAPM: World Association of Perinatal Medicine
WHO: World Health Organization

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There is no conflict of interest.

Availability of data.

Data used in this study are available upon request from the corresponding author.

The author's contribution.

TA designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and HN supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

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