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Research Article

Maternal Healthcare Utilization and Health-Related Quality of Life among Young Pregnant Mothers Aged 10-24 Years in Eastern Uganda: A Cross-sectional Study

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Abstract

Introduction: Young pregnant mothers experience heightened biological, social, and economic vulnerabilities that may compromise health-related quality of life (HRQoL), especially in low-resource settings. Although maternal healthcare service utilization (MHCSU) improves clinical outcomes, evidence linking it to HRQoL among young mothers in Uganda remains limited. This study examined determinants of HRQoL among young pregnant mothers aged 10–24 years in Eastern Uganda, with emphasis on MHCSU.

Methods: A cross-sectional analytical study was conducted among 967 young pregnant mothers in selected districts of Eastern Uganda. The study used baseline data collected prior to randomization and implementation of any intervention. Although the WHOQOL-BREF instrument was administered in full, the present analysis utilized the global quality-of-life item (Question 1: "How would you rate your quality of life?") as the primary outcome measure. Responses ranged from very poor (1) to very good (5) and were analyzed as an ordinal outcome using ordered logistic regression. Data were analyzed using descriptive statistics, ANOVA for bivariate associations and ordered logistic regression models to assess predictors of HRQoL, all conducted at a 95% confidence level.

Results: Results from the bivariate analysis indicated that uptake of antenatal care (ANC), skilled birth attendance (SBA), and access to postnatal care (PNC) were associated with better health-related quality of life (HRQoL) among young pregnant mothers. Mothers who attended antenatal care reported higher mean HRQoL scores compared to those who did not (2.98 ± 1.12 vs. 2.66 ± 0.96, $p = .001$), demonstrating that ANC utilization is positively linked to maternal well-being. Similarly, mothers who delivered with the assistance of skilled birth attendants had higher HRQoL scores than those who did not (3.00 ± 1.11 vs. 2.65 ± 0.97, $p < .001$), indicating the importance of skilled delivery care in improving quality of life. Access to postnatal care also showed a positive association, with mothers who received PNC services reporting higher HRQoL scores compared to those who did not (2.97 ± 1.12 vs. 2.71 ± 1.10, $p = .003$). Overall, these findings suggest that increased utilization of maternal healthcare services is consistently associated with improved HRQoL among young pregnant mothers.

In the ordered logistic regression analysis, ANC uptake remained a statistically significant predictor of HRQoL (OR = 1.686, $p < .001$), indicating that mothers who accessed ANC services had approximately 1.69 times higher odds of being in better quality of life categories compared to those who did not. Similarly, skilled birth attendance was positively and significantly associated with HRQoL (OR = 1.761, $p < .001$), suggesting that mothers who delivered with skilled health personnel were more likely to report improved quality of life outcomes. Access to postnatal care also demonstrated a significant positive effect (OR = 1.552, $p = .002$), implying that mothers who received PNC services had higher odds of better HRQoL. In the multivariable model, immediate health-seeking behavior remained a significant predictor (OR = 1.411, $p = .006$), indicating that prompt care utilization increases the likelihood of improved well-being. Conversely, perceived quality of care was negatively associated with HRQoL; compared to mothers who perceived care as excellent, those who rated care as *good* (OR = 0.394, $p < .001$), *fair* (OR = 0.083, $p < .001$), and *poor* (OR = 0.077, $p < .001$) had significantly lower odds of reporting better quality of life. These findings highlight the critical importance of perceived care quality in shaping maternal well-being.

Conclusion: Maternal healthcare service utilization and positive care experiences were significantly associated with better HRQoL among young pregnant mothers. Expanding access to ANC, SBA, and PNC alongside respectful, youth-responsive care is essential to improve maternal well-being in Eastern Uganda.

Keywords:
Determinants; health-related quality of life; young pregnant mothers; maternal healthcare service utilization; antenatal care; skilled birth attendance; postnatal care; maternal health; Uganda

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Introduction

Pregnancy among adolescents and young women remains a major public health concern globally, especially in sub-Saharan Africa where early childbearing is associated with elevated maternal morbidity, social vulnerability, interrupted education, and poverty [20]. Uganda continues to report high adolescent fertility and persistent inequalities in access to maternal healthcare services, particularly in rural and underserved regions [16].

While maternal health programs traditionally focus on mortality and morbidity reduction, increasing attention has been directed toward health-related quality of life (HRQoL) as a broader measure of maternal well-being. HRQoL encompasses physical health, psychological status, social relationships, and environmental functioning (WHOQOL Group, 1995). During pregnancy and childbirth, young mothers may experience anxiety, stigma, economic dependence, poor social support, and pregnancy-related complications that diminish their quality of life [1].

Maternal healthcare service utilization including antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC) is expected to improve both clinical outcomes and well-being through prevention, treatment, counseling, and continuity of care [18,20]. However, limited empirical evidence exists on how these services influence HRQoL among young pregnant mothers in Uganda. This study therefore examined the determinants of HRQoL among young pregnant mothers aged 10-24 years in Eastern Uganda, with emphasis on maternal healthcare service utilization.

Methods

Study Design and Setting

This study employed a cross-sectional design in Kamuli, Pallisa and Ngora Districts. In order to identify the determinants, data was collected from 967 young mothers aged 10-24 years recruited during pregnancy between October-November 2025. ANC utilization referred to the current pregnancy, whereas SBA and PNC utilization referred to services received during the most recent previous pregnancy among multiparous participants. The study used baseline data collected prior to randomization and implementation of any intervention. The study took on the epistemological lens of post positivism so as to identify the determinants of HRQoL among young pregnant mothers 10-24 years in selected districts in Eastern Uganda [12].

Study Population

The study participants were young mothers aged 10-24 years recruited during pregnancy. The study participants were part of an ongoing RCT whose sample size had been calculated using (Lwanga & Lemeshow, 1991) [8] method.

Sampling and Recruitment

The study employed multi-staged sampling to ensure equal representation from each district. Data was collected using structured questionnaire which had an item rated Content Validity Index of 94.63%. In addition, the questionnaire had a Cronbach alpha of 0.9191 which was considered to be good [10].

Data Management and Analysis

Completed questionnaires were checked daily for completeness and accuracy, then entered into a secure database. Data were analyzed using Stata version 18.5. Descriptive statistics were used to summarize participant characteristics and HRQoL scores. ANOVA was performed to examine differences in HRQoL across categorical predictor variables. Given the ordinal nature of the outcome variable, ordered logistic regression models were fitted to assess the association between predictor variables and HRQoL, while adjusting for potential confounders such as age, marital status, education, and parity. Results were reported as odds ratios with corresponding 95% confidence intervals, and statistical significance was set at $p<0.05$.

Ethical Considerations

Ethical approval was obtained from the Clarke International University Research Ethics Committee (CIUREC; CLARKE-2025-1675), and the Uganda National Council for Science and technology (UNCST; UNCST HS6459ES). Permission to conduct the study was granted by district health offices. Written informed consent was obtained from participants aged 18 years and above, while assent and parental/guardian consent were secured for minors. Confidentiality was maintained by anonymizing data and restricting access to research staff only.

Results

A total of 967 young mothers aged 10–24 years were recruited during pregnancy and participated in the study. The majority of respondents were aged 18-24 years (91.3%), while a smaller proportion 8.7% were aged 10-17 years. Most respondents were married (75.8%), followed by single mothers (15.4%) and those cohabiting (7.8%). Regarding education, 61.3% had attained primary education, 26.2% had secondary or higher education, and 12.5% had no formal education. Majority of the respondents were Catholics 33.9%, followed by Anglicans 31.9% while the least were from Baptist 0.10%, Isamasia 0.52% and traditionalist 0.62% respectively. A higher proportion of respondents had experienced a previous pregnancy (90.4%), while 9.6% were experiencing their first pregnancy. Respondents were drawn from Kamuli (34.7%), Ngora (34.4%), and Pallisa (30.8%) districts as shown in Table 1.

Young pregnant mothers who utilized maternal healthcare services reported significantly higher mean HRQoL scores than non-users.

ANC uptake: Mothers who attended antenatal care had higher mean HRQoL scores than those who did not (2.98 ± 1.12 vs 2.66 ± 0.96; p=0.001). There was a statistically significant association between antenatal care (ANC) uptake and health-related quality of life with higher proportions of mothers reporting good HRQoL among those who attended ANC. These findings suggested that utilization of ANC services plays a crucial role in enhancing the health-related quality of life of young pregnant mothers.

Skilled Birth Attendance: Similarly, mothers who delivered with skilled birth attendance reported better HRQoL compared with those who did not (3.00 ± 1.11 vs 2.65 ± 0.97). This difference was significant and evidenced that SBA & HRQoL were associated ($F = 16.32$, $df = 1, 965$, $p<0.001$). These results highlight the critical role of skilled birth attendance in enhancing maternal well-being and overall quality of life.

Access to postnatal care: Access to postnatal care was also significantly associated with improved HRQoL (2.97 ± 1.12 vs 2.71 ± 1.10; p=0.003). ANOVA ($F = 8.61$, $p = 0.0034$) indicated that these differences are statistically significant, suggesting a positive association between access to PNC services and HRQoL.

Expectant mother factors: Among expectant mother factors, immediate health-seeking behavior was positively associated with HRQoL (p=0.006), while perceived quality of care showed a strong graded relationship with HRQoL, with respondents rating services as excellent reporting the highest quality of life scores (p<0.001). Age group, religion, maternal health knowledge, and previous pregnancy complications were not significantly associated with HRQoL as shown in Table 2.

The ordered logistic regression model was employed to examined the relationship between maternal healthcare service utilization, and perceived health-related Quality of Life (QoL) among 967 participants. The individual models were statistically significant indicating that each maternal health service variable reliably distinguishes between different levels of quality of life. However, the Pseudo R^2 values ranged from 0.003 to 0.006, suggesting a modest level of explanatory power, which is expected given the multifactorial nature of quality of life.

ANC uptake was found to be a positive and statistically significant predictor of quality of life (OR = 1.686, SE = 0.251, z = 3.510, p < .001). This result indicates that young pregnant mothers who accessed ANC services had approximately 1.69 times higher odds of being in a better category of health-related quality of life compared to those who did not. This finding suggests that ANC utilization contributes to improved maternal well-being, possibly through early detection of complications, provision of health education, and psychosocial support during pregnancy.

Table 1. Socio-demographic and reproductive characteristics of young pregnant mothers aged 10-24years in Eastern Uganda (N=967)

Variable	Category	Frequency	Percentage (%)
Age Group	10–17 years	84	8.69
	18–24 years	883	91.31
Marital Status	Married	733	75.80
	Single	149	15.41
	Cohabiting	75	7.76
	Widow	8	0.83
	Widower	2	0.21
Education Level	Non-formal	121	12.51
	Primary	593	61.32
	Secondary	225	23.27
	Tertiary	26	2.69
	University	2	0.21
Religion	Anglican	309	31.95
	Catholic	328	33.92
	Pentecostal	176	18.20
	SDA	24	2.48
	Muslim	118	12.20
	Baptist	1	0.10
	Isamasia	5	0.52
	Traditionalist	6	0.62
Previous Pregnancy	No	93	9.62
	Yes	874	90.38
District	Kamuli	336	34.75
	Ngora	333	34.44
	Pallisa	298	30.82

Source: Field Data 2025

Skilled Birth Attendance also exhibited a positive and statistically significant association with quality of life (OR = 1.761, SE = 0.242, z = 4.120, p < .001). Mothers who delivered with the assistance of skilled health personnel had about 1.76 times higher odds of reporting better quality of life outcomes compared to those who did not. The magnitude and strong statistical significance of this effect highlight skilled

Table 2. Bivariate Associations Between Maternal Healthcare Service Utilization, Expectant Mother Factors and Health-Related Quality of Life Among Young Pregnant Mothers (N=967)

Variable	Category	Mean HRQoL ± SD	Test Statistic	P-Value
Uptake of ANC	No	2.66 ± 0.96	F = 11.25	0.001
	Yes	2.98 ± 1.12		
Skilled Birth Attendance	No	2.65 ± 0.97	F = 16.32	<0.001
	Yes	3.00 ± 1.11		
PNC Access	No	2.71 ± 1.10	F = 8.61	0.003
	Yes	2.97 ± 1.12		
Age group	10-17	2.81 ± 1.04	t = 1.21	0.228
	18-24	2.93 ± 1.10		
Religion	Christian	2.91 ± 1.08	t = 0.98	0.328
	Non-Christian	2.86 ± 1.09		
Maternal Healthcare Knowledge	Yes	2.84 ± 1.07	t = 0.08	0.934
	No	2.90 ± 1.09		
Health-Seeking Behaviour	Delayed care	2.73 ± 1.05	t = 2.74	0.006
	Immediate care	2.97 ± 1.11		
Perceived Quality of Care	Excellent	3.31 ± 1.02	F = 35.70	<0.001
	Good	2.98 ± 1.01		
	Fair	2.54 ± 1.03		
	Poor	2.21 ± 1.00		
Previous Pregnancy Complications	No	2.92 ± 1.08	t = 0.89	0.376
	Yes	2.87 ± 1.09		

Source: Field Data 2025

delivery care as a critical determinant of maternal well-being, likely due to improved management of labor, reduced obstetric risks, and enhanced post-delivery support.

Access to Postnatal Care was similarly associated with improved quality of life and was statistically significant (OR = 1.552, SE = 0.224, z = 3.040, p = 0.002). Mothers who received postnatal care services had approximately 1.55 times higher odds of experiencing better health-related quality of life than those who did not. This positive relationship underscores the importance of postnatal care in facilitating recovery, detecting postpartum complications, and providing essential guidance on maternal and newborn care as shown in Table 3.

Age: Age group was not a significant predictor of health-related QoL. Young pregnant mothers aged 18–24 had slightly lower odds of reporting higher QoL compared to those aged 10–17 (OR = 0.771, p = 0.228), but this difference was not statistically significant. This suggests that perceived quality of life is relatively independent of age within this sample, and that experiential or healthcare-related factors may play a more influential role than age alone.

Table 3. Ordered Logistic Regression analysis of associations between maternal healthcare service utilization and Health-Related Quality of Life among young pregnant mothers (N = 967)

Predictor	OR	SE	z	p	95% CI [LL, UL]
ANC Uptake (Yes vs. No)	1.686	0.251	3.510	< .001	[1.259, 2.257]
Skilled Birth Attendance (Yes)	1.761	0.242	4.120	< .001	[1.345, 2.306]
Postnatal Care Access (Yes vs. No)	1.552	0.224	3.040	0.002	[1.169, 2.061]

Note. $N = 967$. Values are odds ratios (OR). SE = standard error; CI = confidence interval. ANC = antenatal care; PNC = postnatal care. Model fit statistics: ANC Uptake, $\chi^2(1) = 12.300$, $p < .001$, pseudo $R^2 = 0.005$; Skilled Birth Attendance, $\chi^2(1) = 17.010$, $p < .001$, pseudo $R^2 = 0.006$; PNC Access, $\chi^2(1) = 9.260$, $p = 0.002$, pseudo $R^2 = 0.003$

Religion: Religion was also not significantly associated with health-related QoL. Christian young pregnant mothers had slightly lower odds of reporting higher QoL compared to non-Christians (OR = 0.837, p = 0.328), although this effect was not statistically significant. This indicates that religious affiliation alone does not independently predict perceived well-being, and that structural and service-related factors may be more important determinants of QoL.

Maternal healthcare service knowledge was not significantly associated with QoL (OR = 1.023, p = 0.934). This finding suggests that awareness of available maternal health services, while important for service utilization, does not directly translate into improved perceived well-being. Knowledge without positive healthcare experiences may be insufficient to influence quality of life.

Health-seeking behavior: Health-seeking behavior was a significant predictor of QoL. Young pregnant mothers who sought care immediately after recognizing a health concern had higher odds of reporting better health related QoL (OR = 1.411, p = 0.006). This highlights the importance of proactive health behavior, suggesting that early engagement with healthcare services may reduce complications, enhance reassurance, and improve overall well-being.

Perceived quality of care: Perceived quality of care was strongly and significantly associated with QoL. Compared to participants who reported excellent care (reference category), those who rated care as "good" had lower odds of higher QoL (OR = 0.394, p < .001). Those who rated care as *fair* (OR = 0.083, p < .001) or *poor* (OR = 0.077, p < .001) had substantially lower odds of reporting better QoL. These findings indicate that poorer perceptions of care quality are strongly linked to worse perceived well-being, emphasizing the critical role of healthcare experience in shaping maternal quality of life.

Previous pregnancy experience: Experience of complications in the last pregnancy was not significantly associated with health-related quality of life (OR = 0.890, p = 0.376). Young pregnant mothers who had experienced complications in a previous pregnancy did not differ significantly in their quality of life compared to those without such experiences. This suggests that prior pregnancy complications do not independently influence current perceived well-being when other factors are taken into account.

In summary, proactive health-seeking behavior and perceived quality of care were the most important predictors of health-related QoL. While age, religion, maternal health knowledge, and past complications were not significant, the results emphasize that positive experiences with healthcare services and timely health-seeking behavior contribute substantially to higher perceived quality of care.

Overall, the analyses indicate that perceived health-related quality of life among young pregnant mothers is influenced more by experiential and behavioral factors than by socio-demographic characteristics or prior knowledge. Timely health-seeking behavior emerged as a significant positive predictor, showing that mothers who seek care promptly report higher well-being. Perceived quality of care was the strongest predictor, with mothers reporting good or excellent care experiencing substantially higher HRQoL than those perceiving care as fair or poor, highlighting the importance of positive healthcare experiences. In contrast, age, religion, maternal healthcare knowledge, and previous pregnancy complications did not independently predict HRQoL, suggesting that awareness or past experiences alone may not improve perceived well-being without supportive, high-quality healthcare interactions. These

Table 4. Multivariate Ordinal logistic regression analysis for the factors associated with Health-Related Quality of Life among young pregnant mothers aged 10-24years in Eastern Uganda

Predictor	OR	SE	z	p	95% CI [LL, UL]
Age Group (18–24)	0.771	0.166	-1.210	0.228	[0.505, 1.177]
Religion (Christian)	0.837	0.152	-0.980	0.328	[0.586, 1.196]
MHS Knowledge (Yes)	1.023	0.279	0.080	0.934	[0.599, 1.747]
Health-Seeking Immediately (Yes)	1.411	0.178	2.740	0.006	[1.103, 1.805]
Quality of Care (Ref: Excellent)					
Good	0.394	0.086	-4.270	< .001	[0.257, 0.604]
Fair	0.083	0.019	-10.800	< .001	[0.053, 0.130]
Poor	0.077	0.029	-6.720	< .001	[0.036, 0.162]
Last Pregnancy Complications (Yes)	0.890	0.118	-0.890	0.376	[0.687, 1.153]

Note. $N = 967$. Values are odds ratios (OR). SE = standard error; CI = confidence interval. MHS = maternal health services. Model fit statistics: Overall model, $\chi^2(8) = 235.250$, $p < .001$, pseudo $R^2 = 0.086$.

findings emphasize the importance of promoting timely care-seeking and ensuring high-quality, patient-centered maternal healthcare to enhance the quality of life of young pregnant mothers.

Discussion

This study examined the determinants of health-related quality of life (HRQoL) among young pregnant mothers aged 10-24 years in Eastern Uganda, with particular focus on maternal healthcare service utilization. The findings revealed that uptake of antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC) were significantly associated with better HRQoL. In addition, immediate health-seeking behavior and perceived quality of care were important predictors of maternal well-being. These findings suggest that both utilization of maternal healthcare services and positive care experiences are critical for enhancing quality of life among young mothers.

The significant association between ANC uptake and improved HRQoL indicates that antenatal services remain a vital entry point for promoting maternal well-being. Young pregnant mothers who utilized ANC reported better quality of life than those who did not. This finding is consistent with the work of [2], who observed that ANC improves maternal outcomes through screening, prevention, and continuity of care. Similarly, a study [6] found that regular ANC attendance contributes to improved psychological confidence and preparedness for childbirth. The WHO also emphasizes that quality ANC supports positive pregnancy experiences through nutritional counseling, mental health support, and early management of complications [18]. Therefore, the better HRQoL observed among ANC users in this study may be attributed to both medical and psychosocial benefits gained during pregnancy.

Skilled birth attendance was also strongly associated with better HRQoL, suggesting that delivery under trained health professionals improves both maternal safety and overall well-being. Young mothers who delivered with skilled attendants reported higher HRQoL scores than those who did not. The findings agree with results from a study in United Kingdom that also found out that identified skilled birth attendance as one of the most effective interventions for reducing maternal mortality and morbidity [5]. Likewise, skilled and respectful intrapartum care have been found to enhance childbirth experiences, emotional reassurance, and maternal dignity [4]. Furthermore, WHO recommends universal access to skilled birth attendance as a key strategy for improving maternal and newborn outcomes [19]. In the context of Eastern Uganda, these findings imply that expanding access to safe facility delivery may substantially improve both survival outcomes and maternal quality of life.

Postnatal care utilization was similarly associated with improved HRQoL. Young mothers who accessed PNC reported better well-being than those who did not. This result aligns with a study conducted in Uganda and Zambia that found out that postnatal care improves women's physical recovery, psychosocial support, and satisfaction after childbirth [13]. The WHO notes that the postnatal period is crucial for detecting postpartum complications, supporting breastfeeding, and providing family planning counseling [20]. For adolescents and young mothers, who may face anxiety, stigma, and limited support after delivery, access to PNC may be especially beneficial. Therefore, the positive HRQoL outcomes among PNC users in this study reinforce the importance of strengthening postpartum follow-up services.

Immediate health-seeking behavior was another significant predictor of better HRQoL. Young mothers who sought care promptly when symptoms arose were more likely to report improved well-being. This study finding supports the "three delays model" proposed by [14], which explains how delays in deciding to seek care, reaching care, or receiving care contribute to poor maternal outcomes. Similarly, proactive health-seeking behavior increases timely utilization of maternal services and reduces preventable complications [7]. The current findings therefore suggest that empowering young mothers with danger-sign recognition, decision-making confidence, and prompt care-seeking behaviors can improve both health outcomes and perceived quality of life.

Perceived quality of care emerged as one of the strongest determinants of HRQoL. Mothers who rated care as fair or poor were significantly less likely to report better quality of life compared to those who perceived care as excellent. This finding strongly agrees with a global systematic review, which documented that disrespect, abuse, poor communication, and lack of privacy during maternal care negatively affect women's emotional well-being and future care-seeking intentions [3]. Likewise, [15] argued that quality maternal healthcare should include both provision of care and experience of care. Thus, even where services are available, poor provider attitudes or unfriendly environments may diminish maternal well-being. In contrast, respectful, compassionate, and youth-friendly care may enhance confidence, trust, and satisfaction, leading to improved HRQoL.

Interestingly, age group, religion, maternal healthcare knowledge, and previous pregnancy complications were not independently associated with HRQoL after multivariable adjustment. This suggests that socio-demographic factors alone may be less influential than experiential and behavioral factors. Similar findings were reported that women's perceptions of treatment quality and responsiveness often outweigh background characteristics in determining maternal satisfaction and well-being [1]. While knowledge of services is important for increasing utilization, the present findings indicate that awareness alone does not guarantee better quality of life unless accompanied by accessible and high-quality services.

The findings of this study have important implications for policy and practice in Uganda and similar settings. First, increasing uptake of ANC, SBA, and PNC should remain a priority, particularly among adolescents and young mothers. Second, health systems should invest in respectful maternity care, provider communication skills, privacy, and youth-responsive service delivery. Third, community outreach interventions that promote early care-seeking and birth preparedness are needed to address delays in service utilization. These recommendations are consistent with Uganda's RMNCAH Sharpened Plan, which prioritizes adolescent-responsive maternal health services and continuity of care [11].

Overall, this study contributes to growing evidence that maternal healthcare services influence not only survival outcomes but also broader dimensions of health-related quality of life. As countries strive toward the Sustainable Development Goals, HRQoL should be considered a key maternal health outcome, particularly for young mothers who experience heightened vulnerability due to biological, social, and economic factors.

Conclusion

Utilization of ANC, SBA, and PNC was significantly associated with better HRQoL among young pregnant mothers in Eastern Uganda. Immediate health-seeking behavior and positive perceptions of care further enhance maternal well-being. Strengthening equitable access to quality, respectful, and youth-responsive maternal healthcare services is therefore essential for improving maternal outcomes and quality of life among young mothers.

Competing Interests

The authors have declared that no competing interests exist.

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Authors' Contributions

NJ conceptualized and designed the study. MM, MN, FPK and OM participated in data analysis and methodology alignment. All authors contributed to the drafting, critical review, editing, and final approval of the manuscript.

Consent for Publication

All participants provided informed consent for participation and publication. Consent was documented within the informed consent form, which included explicit agreement that anonymized data and results could be published and disseminated among relevant stakeholders.

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