UTILISATION OF SKILLED VERSUS UNSKILLED BIRTH ATTENDANCE AMONG RURAL WOMEN IN NIGERIA: A META-ANALYSIS

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Abstract

Utilisation of skilled birth attendance is a key strategy for reducing maternal mortality, yet rural women in Nigeria continue to experience poor access to skilled delivery care. Fragmented evidence has limited understanding of the magnitude and comparative utilisation of skilled and unskilled birth attendance in rural Nigeria**.** This review with meta-analysis examined the rate of skilled versus unskilled birth attendance utilization among rural women in Nigeria. A systematic search of PubMed, Scopus, and Web of Science was conducted for English-language studies published between January 2021 and 2026. All articles selected employed observational design and all these studies reporting utilisation of skilled or unskilled birth attendance among rural Nigerian women were included. Study quality was assessed using the CASP tool. Pooled prevalence estimates were calculated using meta-analytic techniques and odds ratios were used to compare utilisation patterns. Seven studies involving 69,481 rural women were included. The pooled utilisation of skilled birth attendance was 41%, while unskilled birth attendance was 59%. Rural women were significantly more likely to utilise unskilled than skilled birth attendance (*OR = 2.07; 95% CI: 1.17–3.64; p = 0.011)*. Unskilled birth attendance remains predominant among rural women in Nigeria, highlighting persistent gaps in access to skilled delivery care. This study therefore recommends that, policies should prioritize expansion of accessible and acceptable skilled maternity services in rural communities to improve maternal health outcomes.

Keywords: Maternal health, Nigeria, Rural women, Skilled birth attendance; Unskilled birth attendance

INTRODUCTION

Maternal and neonatal health outcomes are key indicators of health system performance and social development. Globally, pregnancy and childbirth pose substantial risks to women and newborns (Fagbamigbe & Oyedele, 2022). Sub-Saharan Africa accounts for a disproportionate share of preventable maternal and neonatal deaths (Walker et al., 2021). Nigeria, which is the most populous country in Africa, contributes significantly to the burden as it records one of the highest maternal mortality ratios in the region (Afape et al., 2024). Despite global and national commitments to improving maternal health through Sustainable Development Goal (SDG) 3, the progress has been uneven with disparities between urban and rural populations (Abdullahi et al., 2023).

One major evidence-based intervention for reducing maternal and neonatal morbidity and mortality is skilled birth attendance (SBA) during labour, delivery, and the immediate postpartum period (Talon et al., 2023). Afroja et al. (2022) noted that skilled birth attendants are typically doctors and nurses-

midwives who are trained to manage deliveries and recognise, prevent, and treat obstetric complications. They are widely recognised as central to safe motherhood strategies. In contrast, unskilled birth attendance is provided by traditional birth attendants, relatives, or other untrained individuals and poses increased risks of adverse maternal and neonatal outcomes (Mohammed et al., 2022). Consequently, increasing the proportion of births attended by skilled health personnel has become a global public health priority and a core indicator for monitoring maternal health progress (Mathewos-Oridanigo & Kassa, 2022).

In Nigeria, the utilisation of skilled birth attendance remains suboptimal among rural women. National surveys consistently demonstrate wide rural–urban disparities in access to and use of skilled delivery services (Abdulwahab et al., 2023). Olori et al. (2023) observed that while urban women increasingly deliver in health facilities under the supervision of skilled birth attendants (SBAs), a substantial proportion of rural women continue to give birth at home and in informal settings with unskilled attendants (USBAs). These patterns may reflect a complex interplay of structural health system issues, socioeconomic (poverty), and cultural factors.

Rural Nigeria presents unique contextual challenges that exacerbate reliance on unskilled birth attendants. Oluwole et al. (2024) highlighted that many rural communities are characterised by limited health infrastructure, shortages of skilled health personnel, poor road networks, and weak referral systems. Other issues may include: traditional beliefs surrounding childbirth, trust in USBAs, gender norms, and decision-making dynamics within households often influence women's choices regarding place of delivery and type of birth attendant. In some settings, unskilled attendants are perceived as more culturally sensitive, affordable, and accessible than formal health services (Opirite & Anunciata, 2024). These factors collectively contribute to persistent low uptake of SBA among rural women, despite decades of policy initiatives and maternal health programs.

Over the years, numerous primary studies such as Abdullahi et al (2022), Oluwole et al (2024), and Peter-Kio et al (2024) have examined the utilisation of skilled versus unskilled birth attendance in specific regions of Nigeria. However, no clear pooled estimates for the entire country have been published within the past five years in reputable research databases. As a result, there remains uncertainty regarding the pooled magnitude of skilled and unskilled birth attendance among rural women in Nigeria.

Systematic reviews with meta-analysis provide a rigorous approach for synthesising existing evidence, generating pooled estimates, and identifying patterns that may not be apparent in individual studies (Azarian et al., 2023). By systematically identifying, appraising, and quantitatively combining relevant studies, such reviews enhance the precision of estimates and strengthen the evidence base for policy and practice (Varsha et al., 2024). In the context of maternal health in Nigeria, a systematic review with meta-analysis focusing on skilled versus unskilled birth attendance among rural women is valuable for informing targeted interventions, resource allocation, and policy reforms.

Despite the importance of this topic, there is a paucity of recent syntheses of evidence that specifically compared the utilisation of skilled and unskilled birth attendance among rural Nigerian women. Existing reviews often address broader themes such as maternal health service utilisation or skilled birth attendance in specific communities without disaggregating rural populations or explicitly contrasting skilled and unskilled care. This gap limits the ability of policymakers, program planners, and healthcare providers to design context-specific strategies that address this unique phenomenon among rural women. Therefore, this systematic review with meta-analysis synthesised available evidence on the utilisation of skilled versus unskilled birth attendance among rural women in Nigeria. By providing pooled estimates, this review seeks to offer robust evidence to support policies and interventions that promote skilled birth attendance, and ultimately improve maternal and neonatal outcomes in Nigeria.

To address the identified gap, the present study applied the PICO framework (Hosseini et al., 2024) to clearly define the research question underpinning this systematic review with meta-analysis.

Population (P): Rural women in Nigeria who have experienced childbirth. Intervention (I): Utilisation of SBA. Comparison (C): Utilisation of unskilled birth attendance (USBA). Outcome (O): Prevalence and the comparative likelihood of utilisation expressed as an odds ratio. The research question was articulated as follows: Among rural women in Nigeria, what is the pooled prevalence of utilisation of skilled birth attendance compared with unskilled birth attendance, and is there a statistically significant difference in the proportions of utilisation between the two, as measured by odds ratio?

Guided by the stated research question, the study did the following: (1) Determined the pooled prevalence of utilisation of skilled birth attendance among rural women in Nigeria by synthesising data from eligible primary studies. (2) Determined the pooled prevalence of utilisation of unskilled birth attendance among rural women in Nigeria using the same evidence base. (3) Compared the pooled prevalences of skilled and unskilled birth attendance to identify which type of birth attendance is more commonly utilised among rural women and estimate how much greater its utilisation is relative to the other.

METHODS

This systematic review with meta-analysis was conducted using rigorous and transparent methodological procedures to ensure reproducibility and reliability of findings. The review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

The search string for the review was developed using a combination of free-text keywords and Boolean operators. The core search terms included synonyms related to skilled birth attendance, unskilled birth attendance, traditional birth attendants, facility delivery, home birth, rural women, and Nigeria. Boolean operators (AND , OR; MacFarlane et al., 2022) were applied to combine the concepts and truncations (*; Hunter et al., 2022) were applied to broaden the search. The specific search string was as follows: *(skilled birth attendan* OR skilled delivery OR facility delivery OR health facility birth OR institutional delivery) AND (unskilled birth attendan* OR traditional birth attendan* OR home delivery OR home birth) AND (rural women OR rural community) AND (Nigeria)*.

The electronic databases PubMed, Scopus, and Web of Science were systematically searched. PubMed was selected for its extensive coverage of biomedical, public health, maternal, and reproductive health literature (Misra & Ravindran, 2022). Scopus was included due to its broad interdisciplinary scope and comprehensive indexing of peer-reviewed journals and Web of Science was searched to capture high-quality studies with enhanced citation tracking (Kumpulainen & Seppänen, 2022). The use of multiple databases reduced the likelihood of missing relevant studies and minimised database-related publication bias. The search was limited to studies published between January 2021 and 2026 to ensure that the review captured the most recent and policy-relevant evidence, reflecting current maternal health contexts and practices in Nigeria. Only studies published in the English language were included, as English is the primary language of scientific publication in Nigeria. The electronic database searches were conducted systematically using the predefined search strings adapted to the indexing requirements of each database. Search results from all databases were exported into Microsoft Excel for reference management, where duplicates were identified and removed. In addition to database searches, hand searching of reference lists of identified studies was performed to find additional eligible studies not captured through electronic searches in order to strengthen the completeness of record identification.

Study selection followed a multistage screening process. Firstly, title screening was conducted to exclude clearly irrelevant records based on study outcome variables. Secondly, abstract screening was performed to exclude irrelevant records based on the country and population of focus. Thirdly, full-text articles of shortlisted studies were retrieved and assessed in detail for eligibility (alignment with the inclusion criteria). Studies were included if they were observational studies and reported empirical data on utilisation of skilled and/or unskilled birth attendance among rural women in Nigeria. Studies conducted outside Nigeria or that lacked relevant outcome data were excluded. Discrepancies at any

stage of screening were resolved through discussion and consensus among members of the review team.

The methodological quality of included studies was assessed using the Critical Appraisal Skills Programme (CASP) tool for non-experimental studies. The CASP checklist was used to evaluate study rigour, including clarity of objectives, appropriateness of methodology, sampling strategy, data collection, analysis, and relevance of findings. All the included studies satisfied above 9 out of 13 quality appraisal (CASP) items, hence acceptable. Furthermore, publication bias was assessed using the funnel plot supported with Egger's statistics. There was no funnel asymmetry observed and no evidence of publication bias among the included studies ($p = 0.804$) as shown in figure 1 below.

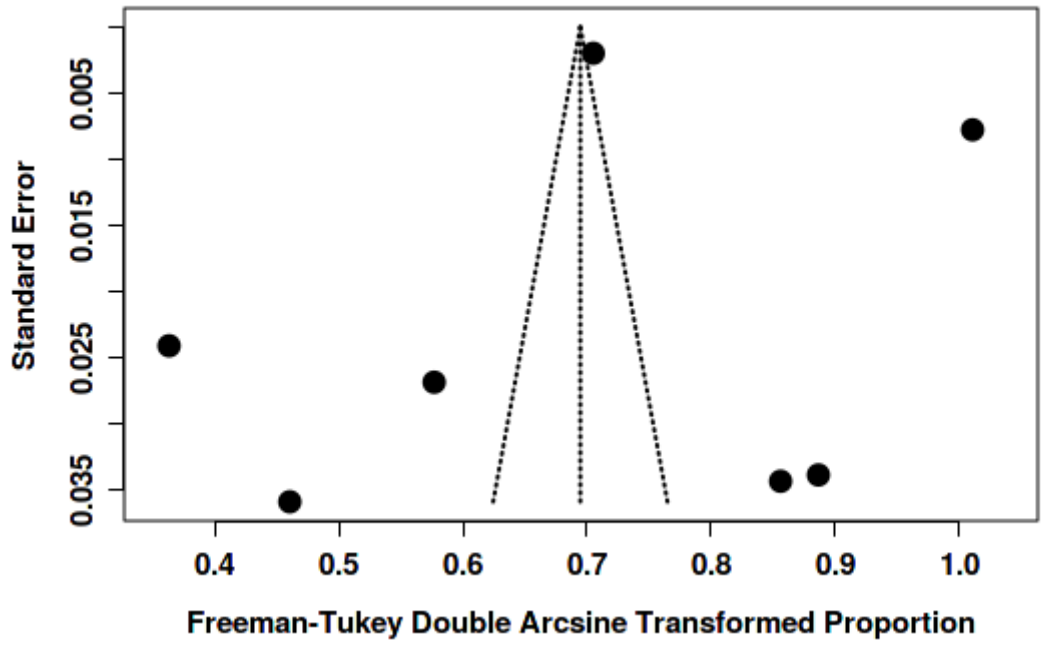

Figure 1: Funnel plot for the assessment of publication bias (Intercept = 2.27; 95% Confidence Interval CI (-14.79 - 19.33); t = 0.261, p = 0.804)

Data were extracted using a standardised data extraction form developed specifically for this review. Extracted information included author and year of publication, Country, Geographical region, Aim, Population description, study design, sample size, sampling method, skilled birth attendance utilisation level, and unskilled birth attendance utilisation level. Data extraction was conducted systematically to ensure consistency and completeness. A quantitative synthesis was performed using meta-analysis techniques. Pooled prevalence estimates for utilisation of skilled birth attendance and unskilled birth attendance were calculated using the random effects model with the inverse variance method and Freeman-Tukey Double arcsine transformation statistical models. Odds ratios with corresponding 95% confidence intervals were computed to compare utilisation between skilled and unskilled birth attendance and to assess the magnitude and direction of differences in proportions. Statistical heterogeneity was assessed using the I2 statistic, and results were presented using the forest plots.

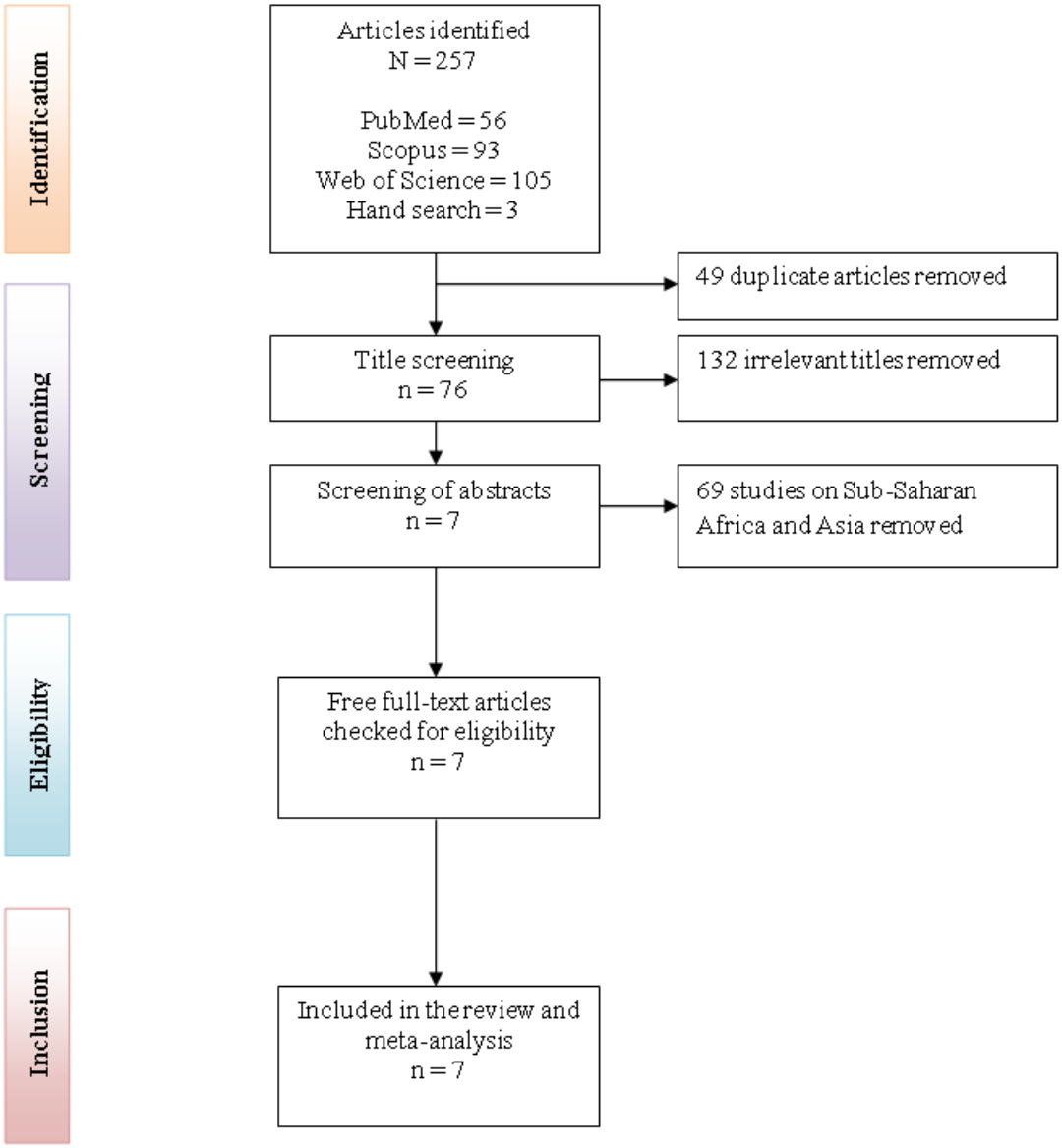

Figure 2: PRISMA flow diagram of the study selection process

Figure 2 illustrates the systematic study selection process using the PRISMA flow diagram. The identification phase started with the literature search across three electronic databases, yielding a total of 257 articles: 56 from PubMed, 93 from Scopus, and 105 from Web of Science, supplemented by 3 additional records identified through hand-searching. After the removal of 49 duplicate records, 208 unique articles advanced to the title screening stage. During the title screening, 132 article titles were deemed irrelevant based on predetermined exclusion criteria, leaving 76 articles for abstract screening. At the abstract screening stage, a further 69 studies were excluded due to their geographical focus on Sub-Saharan Africa and Asia, narrowing the pool to 7 articles that proceeded to the eligibility assessment. All 7 remaining articles underwent full-text review to determine their suitability for inclusion based on the eligibility criteria. All 7 articles met the necessary criteria and were included in the subsequent review and meta-analysis.

Table 1: Characteristics of included studies, n = 7

Author(Year)	Country	Geographical Region	Aim	Population description	Design	Sampling	Sample Size
Abdullahi et al (2022)	Nigeria	Northern	Assessed the utilisation of Skilled Birth Attendance (SBA) in rural communities of Kano state	Rural women	Observational	Multi-stage sampling	194
Abdulwahab et at (2023)	Nigeria	Northern	Explored the utilization of TBAs by women in a rural community, in order to identify healthcare gaps towards the provision of needed intervention.	Childbearing women in the rural community	Observational	Consecutive sampling	212
Olori et al (2023)	Nigeria	Northern	Assessed the perception and utilisation of Traditional Birth Attendnts (TBAs) among women attending primary health care clinics in Bosso Local Government Area, Niger State, Nigeria	Rural dwelling women of childbearing age	Observational	Multistage sampling method	218
Oluwole et al (2024)	Nigeria	Southern	Assessed the of TBA services among rural-dwelling pregnant women in Lagos, Nigeria.	Rural dwelling pregnant women	Observational	Simple random sampling	347
Peter-Kio et al (2024)	Nigeria	Southern	Determined the factors influencing the utilization of Traditional Birth Attendants among women	Rural women of reproductive age	Observational	Three stage sampling	431

			in Ogba/Egbema/ Ndoni local government area of rivers state				
Uduak et al(2022)	Nigeria	Northern and Southern	Analyzed the use of SBAs at delivery among Nigerian reproductive women	Rural reproductive women	Observational	Multistage sampling	4155
Walker et al. (2021)	Nigeria	Northern and Southern	Explored SBA service utilisation during delivery in Nigeria	Rural childbearing women	Observational	Two-stage cluster sampling	63924

SBAs = Skilled Birth Attendants, USBAs = Unskilled Birth Attendants

Table 1 presents the characteristics of the included studies, and showed that the review included seven observational studies conducted in Nigeria between 2021 and 2024, comprising a total sample of 69,481 rural women. The studies were distributed across northern Nigeria, southern Nigeria, and combined settings. The study aims focused on the utilisation of SBAs and USBAs. Populations included rural women of reproductive (childbearing) age. Sampling approaches varied and included multistage, cluster, random, and consecutive sampling. Sample sizes ranged from 194 to 63,924 respondents.

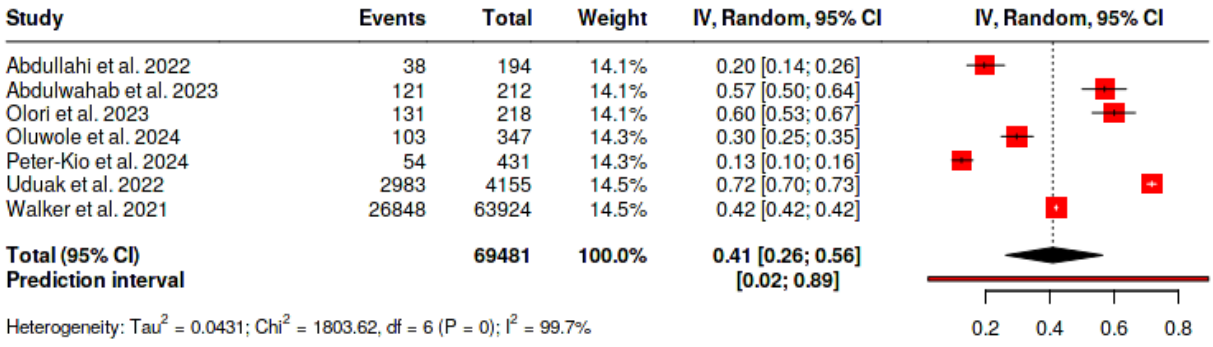

Figure 3: The pooled utilisation of Skilled Birth Attendance among rural women in Nigeria

Figure 3 presents the pooled utilisation of skilled birth attendants among rural women in Nigeria, and revealed it to be at 41%, with a 95% confidence interval ranging from 26% to 56%. Although this pooled estimate provides an overall measure of skilled birth attendance utilisation, substantial and statistically significant heterogeneity was observed across the included studies ($p < 0.01$), indicating considerable variability in utilisation rates between study settings and populations.

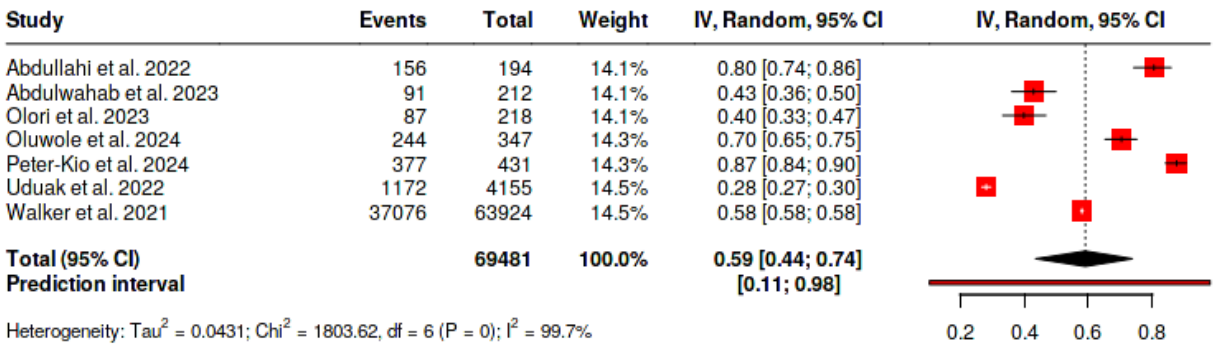

Figure 4: The pooled utilisation of Unskilled Birth Attendance among rural women in Nigeria

Figure 4 presents the pooled utilisation of Unskilled Birth Attendance among rural women in Nigeria an demonstrated that the pooled utilisation of skilled birth attendants among rural women in Nigeria was 59% (95% confidence interval: 44% to 74%). Nevertheless, statistically significant heterogeneity was observed across the included studies ($p < 0.01$), indicating considerable variation in utilisation estimates between study populations and settings.

Table 2: presents a comparison of the pooled prevalence of birth attendance utilisation

Category	Proportion (%)	Odds Ratio	p value
Utilised USBA	59	2.07 (1.17 - 3.64)	0.011
Utilised SBA	41		

SBA = Skilled Birth Attendance, USBA = Unskilled Birth Attendance, $p < 0.05$ is significant

Table 2 presents a comparison of the pooled prevalence of birth attendance utilisation and showed that utilisation of unskilled birth attendance was significantly higher than the utilisation of skilled birth attendance among rural women in Nigeria (59% vs. 41%, p = 0.011). Additionally, the odds of utilising unskilled birth attendance were 2 times that of skilled birth attendance (OR: 2.07; 95% CI: 1.17–3.64), further substantiating a statistically significant difference in utilisation between the two categories.

DISCUSSION

This review found that the pooled utilisation of skilled birth attendants (SBAs) among rural women in Nigeria was low (41%). This finding may be due to persistent facility and sociocultural barriers in rural settings. Saadu and Bello (2025) noted that some of the barriers may include poor physical access to health facilities, shortages of skilled health personnel, indirect costs of facility delivery, and entrenched cultural preferences for home births. Similar low utilisation of SBAs was reported in rural Ethiopia (46%) and Chad (41%) by Kea et al. (2023) and Negash and Wubneh (2025) respectively, where distance to facilities, poverty, and low female education were key barriers. The slightly higher SBA utilisation of 46% that was reported in Ethiopia (Kea et al., 2023) could be attributable to slightly stronger community health extension programs. In contrast, studies from Bangladesh such as Chowdhury et al. (2023) and Papua New Guinea such as Seidu et al. (2022) reported higher SBA utilisation rates of 53% and 57% respectively. The discrepancy is likely due to sustained investments in rural midwifery services. This finding underscores the need for targeted rural health system strengthening in Nigeria.

The pooled prevalence of unskilled birth attendance (USBA) was high at 59%, indicating that the majority of rural Nigerian women rely on traditional birth attendants or non-skilled caregivers. This pattern is likely driven by affordability, cultural acceptability, perceived emotional support, and geographical proximity of unskilled attendants (Islam et al., 2024). Comparable high reliance on USBA has been documented in rural Sierra Leone (64%) by Kangbai et al. (2022), where traditional birth attendants remain embedded in community life. Nonetheless, lower rates of utilisation of USBA

were reported in Kenya (20%) and Uganda (13%) by Badru et al. (2022) and Kamya (2026) respectively. The differences in prevalence across the settings may reflect variations in regulatory frameworks governing unskilled birth practices. Additionally, this finding was higher than the pooled estimate of 12% for the entire African continent (Belay et al., 2025). This dissimilarity could be because some African countries like South Africa, Kenya, and Egypt has successfully implemented integration of skilled community-based birth services and reduced dependence on unskilled care (Agboyo et al., 2024; Belay et al., 2025). This finding highlights the urgent need to address demand-side and supply-side determinants of delivery care.

The meta-analysis demonstrated that rural women were more than twice as likely to utilise unskilled birth attendance compared with skilled birth attendance (*OR = 2.07; p = 0.011*). This disparity suggests that unskilled care remains the dominant childbirth option in rural Nigeria. Similar dominance of unskilled attendance has been observed in rural Chad by Bobo et al. (2021), where health system fragility and sociocultural norms strongly influence delivery practices. Furthermore, the finding aligns with Islam et al. (2024) that observed the dominance of USBA due to ineffective policy implementations toward facility birth. The persistence of higher odds of USBA in Nigeria mirror gaps in rural maternal health coverage and policy implementation. Addressing this imbalance is critical for improving maternal and neonatal outcomes in the country.

CONCLUSION

This systematic review with meta-analysis demonstrates that utilisation of skilled birth attendants among rural women in Nigeria remains suboptimal, while unskilled birth attendance predominates. The significantly higher odds of unskilled compared with skilled birth attendance highlight persistent inequities in access to quality maternal health services in rural settings. These findings underscore the need for context-specific interventions that address structural, cultural, and health system barriers to skilled delivery care. Strengthening rural health infrastructure and improving acceptability of skilled care are essential for accelerating progress toward improved maternal and neonatal outcomes in Nigeria.

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