

Knowledge, attitude, and health-seeking behaviour regarding male infertility among men in Northeastern Nigeria

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Abstract

Background: Male infertility accounts for approximately 20–30% of all cases of infertility globally, yet it remains disproportionately underdiagnosed and underreported in sub-Saharan Africa. This study assessed the level of knowledge, attitudes, and health-seeking behaviour regarding male infertility among men in northeastern Nigeria.

Methods: A descriptive cross-sectional survey was conducted among 271 men across six states in northeastern Nigeria using a structured self-administered questionnaire. Data were analysed using descriptive statistics and chi-square tests of association.

Results: Good overall knowledge of male infertility was found in 88.2% of respondents (mean score: 3.91 ± 1.10 out of 5). However, awareness of the role of smoking in male fertility was limited, with only 49.8% correctly identifying it as a risk factor. Positive attitudes were found in 58.7% of respondents; notably, 50.2% agreed that male infertility reduces social respect. All respondents (100%) expressed willingness to seek hospital care if infertile, but 35.4% would consider traditional healers first. The primary perceived barriers to hospital care were lack of knowledge (41.3%), cost (26.2%), and cultural beliefs (14.8%). Educational attainment was significantly associated with good knowledge ($\chi^2 = 16.57$, $p < 0.001$) and hospital-seeking intention ($\chi^2 = 6.88$, $p = 0.009$).

Conclusion: While men in northeastern Nigeria demonstrate a reasonably high level of knowledge regarding male infertility, important gaps remain in risk-factor awareness and attitudinal constructs related to stigma. Educational and community-based health promotion interventions are urgently needed to improve equitable access to reproductive health care for men in this region.

Keywords: Male Infertility; Knowledge; Attitude; Health-Seeking Behaviour; Northeastern; Reproductive Health

1. Introduction

Infertility is usually defined as the inability of a couple to produce a clinically significant pregnancy even after a period of 12 months of unprotected, frequent sexual intercourse. This condition is a globally recognised public health problem,

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estimated to affect about 160 million individuals worldwide, with around 48 million couples experiencing difficulty conceiving (1,2). While the condition is often socially attributed to women, current evidence consistently indicates that male factors contribute to approximately 20–30% of infertility cases, either as a sole cause or in combination with female factors (1,3). Despite this, male infertility remains considerably underdiagnosed and inadequately addressed, particularly in low- and middle-income countries (LMICs) in sub-Saharan Africa.

In Nigeria, cultural and societal constructs of masculinity are deeply intertwined with fertility. A man's identity, social standing, and marital stability are often contingent upon his ability to father children (4). Consequently, infertility in men is frequently concealed rather than addressed clinically, reinforcing patterns of delayed or absent health-seeking behaviour (5). The northeast geopolitical zone which comprises of Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe states is among the most vulnerable regions in Nigeria, characterised by entrenched poverty, healthcare infrastructure deficits, and ongoing humanitarian challenges arising from over a decade of insurgency (6).

Globally, studies have demonstrated that men's knowledge about infertility is often limited, particularly in relation to modifiable risk factors such as smoking, occupational exposures, and sexually transmitted infections (STIs) (7,8). In sub-Saharan Africa, attitudinal barriers including stigma, shame, and the belief that infertility is predominantly a woman's problem continue to deter men from seeking formal medical evaluation (9,10). Furthermore, structural obstacles such as cost, distance to health facilities, and inadequate awareness of available services compound the challenge (11).

While a number of studies from West Africa and Nigeria have examined female perceptions of infertility, data specifically exploring male knowledge, attitudes, and health-seeking behaviour in northeastern Nigeria are noticeably absent from the literature. This geographic and epidemiological gap undermines the development of region-specific reproductive health policies and programmes. The present study was therefore designed to systematically assess the level of knowledge, prevailing attitudes, and health-seeking behaviour regarding male infertility among men in northeastern Nigeria, and to identify sociodemographic predictors of these outcomes.

2. Materials and methods

2.1. Study Design and Setting

This was a descriptive cross-sectional survey conducted among adult men residing across the six states of northeastern Nigeria: Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe. The study was carried out between December 2025 to January 2026. The northeast zone is geographically and culturally distinct, predominantly Muslim, and hosts a large internally displaced population due to ongoing insecurity, making it a high-priority region for targeted public health research.

2.2. Participant Eligibility and Sampling

Eligible participants were male adults aged 18 years and above who were residents of any of the six northeastern states, had access to internet and the google form and provided informed consent. Men who were unable to read or understand the questionnaire in English, couldn't access internet and/or who declined to participate, and all females were excluded. A convenience sampling approach was employed, utilizing a structured self-administered electronic questionnaire distributed through community networks, social media platforms including WhatsApp and Facebook. A total of 271 completed responses were obtained

2.3. Data Collection Instrument

Data was collected between December 2025 to January 2026 using Google Forms distributed electronically. The structured questionnaire was developed based on existing validated tools used in similar African and Nigerian reproductive health studies (8,12). The instrument comprised four sections: (i) sociodemographic characteristics (age, marital status, educational attainment, occupation, and state of residence); (ii) knowledge items relating to the definition, causes, and risk factors of male infertility (5 items); (iii) attitude items using a 3-point Likert scale (Agree/Neutral/Disagree) on social and personal dimensions of male infertility (3 items); and (iv) health-seeking behavior items examining service utilization intentions, traditional health recourse, and perceived barriers to formal care-seeking (3 items).

2.4. Scoring and Operationalization

For the knowledge domain, responses were scored as 1 (correct) or 0 (incorrect/unsure). The total knowledge score ranged from 0 to 5. A score of 3 or above ($\geq 60\%$) was defined as 'good knowledge', consistent with the approach employed in comparable published studies (8). For the attitude domain, a score of 2 or above (out of 3) was classified as 'positive attitude'. Health-seeking behavior was assessed by examining the respondent's stated intention to prioritize formal hospital care over traditional healers.

2.5. Data Analysis

Data were entered, cleaned, and analyzed using Python (version 3.11) with the pandas and scipy libraries. Frequency and percentage distributions were computed for all categorical variables. The mean $\pm$ standard deviation (SD) was calculated for continuous variables. Chi-square (χ^2) tests of association were performed to examine relationships between sociodemographic variables and the primary outcomes (knowledge, attitude, and health-seeking behavior). A p-value of <0.05 was considered statistically significant.

2.6. Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki (13). Informed consent was obtained from all participants prior to questionnaire administration. Participation was entirely voluntary and confidential.

3. Results

3.1. Sociodemographic Characteristics

A total of 271 men participated in the study. Their ages ranged from 22 to 63 years, with a mean age of 33.6 ± 9.5 years. The majority (59.8%) were aged 25–34 years. Over half of the respondents (54.2%) were single, while 45.8% were married. Most participants (78.2%) had attained tertiary-level education. In terms of occupation, business engagement was the most reported (23.6%), followed by civil service (17.7%) and students (17.7%). Representation was obtained from all six northeastern states, with the highest proportion from Adamawa State (31.0%), followed by Bauchi (18.8%) and Borno (16.2%). Detailed sociodemographic data are presented in Table 1

Table 1 Sociodemographic Characteristics of Study Participants (N = 271)

Variable	Frequency (n)	Percentage (%)
Age Group (Years)		
18–24	31	11.4
25–34	162	59.8
35–44	43	15.9
45–54	19	7.0
55 and above	16	5.9
<i>Mean $\pm$ SD: 33.6 $\pm$ 9.5 years; Range: 22–63</i>		
Marital Status		
Single	147	54.2
Married	124	45.8
Educational Attainment		
Secondary	54	21.8*
Tertiary	194	78.2*
Occupation		
Business	64	23.6
Civil Servant	48	17.7

Student	48	17.7
Farmer	40	14.8
Job Applicant/Unemployed	39	14.4
Military/Paramilitary	32	11.8
State of Residence		
Adamawa	84	31.0
Bauchi	51	18.8
Borno	44	16.2
Yobe	42	15.5
Taraba	30	11.1
Gombe	20	7.4
Total	271	100

Note. *Percentages calculated after excluding 23 respondents with missing education data.

3.2. Knowledge of Male Infertility

Overall, 88.2% of participants demonstrated good knowledge of male infertility (score ≥ 3 out of 5), with a mean knowledge score of 3.91 ± 1.10 . The vast majority correctly identified the definition of male infertility (91.1%) and recognized that hormonal problems can cause infertility (91.1%). A high proportion (85.2%) correctly identified that infertility is not exclusively a woman's problem. Knowledge of STIs as a cause of infertility was acknowledged by 73.4% of respondents. However, only 49.8% correctly identified smoking as a risk factor for male fertility, while 23.6% incorrectly stated it had no effect, and 26.6% were unsure. Complete knowledge data are presented in Table 2.

Table 2 Knowledge of Male Infertility Among Respondents (N = 271)

Knowledge Item	Yes / Correct n (%)	No / Incorrect n (%)	Not Sure / Maybe n (%)
Male infertility means a man cannot cause pregnancy	247 (91.1)	0 (0.0)	24 (8.9)
Smoking can affect male fertility	135 (49.8)	64 (23.6)	72 (26.6)
Sexually transmitted infections can cause infertility	199 (73.4)	16 (5.9)	56 (20.7)
Hormonal problems can cause infertility	247 (91.1)	0 (0.0)	24 (8.9)
Infertility is only a woman's problem (No = correct)	8 (3.0)	231 (85.2)	32 (11.8)
Good knowledge score ($\geq 3/5$)	239 (88.2)	—	—
Mean knowledge score $\pm$ SD	3.91 $\pm$ 1.10		

3.3. Attitudes Towards Male Infertility

Overall, 58.7% of respondents demonstrated positive attitudes towards male infertility (score ≥ 2 out of 3), with a mean attitude score of 1.64 ± 0.68 . The majority (88.2%) expressed willingness to support a friend with infertility. However, attitudes related to stigma revealed concerning patterns: 50.2% agreed that male infertility reduces respect in society, and 20.7% believed that a man with infertility should feel ashamed, with only 41.0% expressing outright disagreement with this statement. Attitude data are presented in Table 3.

Table 3 Attitudes Towards Male Infertility Among Respondents (N = 271)

Attitude Item	Agree n (%)	Neutral n (%)	Disagree n (%)
A man with infertility should feel ashamed	56 (20.7)	104 (38.4)	111 (41.0)
Male infertility reduces respect in society	136 (50.2)	40 (14.8)	95 (35.1)
I will support a friend with infertility	239 (88.2)	32 (11.8)	0 (0.0)
Positive attitude ($\geq 2/3$)	159 (58.7)	—	—
Mean attitude score $\pm$ SD	1.64 $\pm$ 0.68		

3.4. Health-Seeking Behavior

All 271 respondents (100.0%) expressed the intention to seek hospital care if they were diagnosed with infertility. Nevertheless, 35.4% acknowledged they would consider consulting traditional healers before accessing formal medical services. The most frequently cited barrier to hospital-based care was lack of knowledge (41.3%), followed by cost of treatment (26.2%), cultural beliefs (14.8%), stigma (11.8%), and distance to health facilities (5.9%). Health-seeking behavior data are summarized in Table 4

Table 4 Health-Seeking Behavior Regarding Male Infertility (N = 271)

Health-Seeking Behavior Item	Frequency (n)	Percentage (%)
If I had infertility, I would go to hospital		
Yes	271	100.0
I will consider traditional healers first		
No (would seek hospital care first)	175	64.6
Yes (would try traditional healers first)	96	35.4
Perceived barriers to hospital-seeking care		
Lack of knowledge	112	41.3
Cost of treatment	71	26.2
Cultural belief	40	14.8
Stigma	32	11.8
Distance to health facility	16	5.9

3.5. Association Between Sociodemographic Variables and Study Outcomes

Chi-square analysis revealed statistically significant associations between educational attainment and good knowledge ($\chi^2 = 16.57$, $df = 1$, $p < 0.001$), with tertiary-educated respondents significantly more likely to have good knowledge (92.3%) compared to those with secondary education (70.4%). Educational attainment was also significantly associated with hospital-seeking intention ($\chi^2 = 6.88$, $df = 1$, $p = 0.009$). Marital status was significantly associated with positive attitude ($\chi^2 = 4.69$, $df = 1$, $p = 0.030$), with married men demonstrating a higher proportion of positive attitudes (66.1%) compared to single men (52.4%). No statistically significant association was observed between age group and knowledge ($\chi^2 = 34.73$, $df = 4$, $p < 0.001$, noting that the 18–24 age group achieved 100% good knowledge). Summary of associations are presented in Table 5.

Table 5 Association Between Sociodemographic Variables and Study Outcomes (N = 271)

Variable	Good Knowledge n (%)	χ^2	p-value	Positive Attitude n (%)	χ^2	p-value	Hospital-Seeking n (%)
Educational Attainment							
Secondary (n=54)	38 (70.4)	16.57	<0.001	27 (50.0)	6.88	<0.009	25 (46.3)
Tertiary (n=194)	179 (92.3)			130 (67.0)			130 (67.0)
Marital Status							
Married (n=124)	110 (88.7)	—	—	82 (66.1)	4.69	<0.030	83 (66.9)
Single (n=147)	129 (87.8)			77 (52.4)			92 (62.6)

χ^2 = Chi-square statistic; p < 0.05 considered statistically significant. Bold values indicate statistical significance.

4. Discussion

This study provides a systematic assessment of male knowledge, attitudes, and health-seeking behavior regarding male infertility across all six states of northeastern Nigeria. The findings reveal a generally high level of knowledge, moderately positive attitudes, and near-universal expressed intention for formal hospital care, though with persistent attitudinal stigma, a notable knowledge gap around modifiable lifestyle risk factors, and meaningful structural barriers to care-seeking. Together, these results offer a regionally specific empirical foundation that has previously been little or absent from the reproductive health literature concerning northeastern Nigeria. These findings have important implications for reproductive health programming, clinical practice, and health policy in this underserved region.

The proportion of respondents with good knowledge of male infertility was 88.2%, with a mean knowledge score of 3.91 ± 1.10 out of 5. This finding is comparatively high, relative to similar studies across sub-Saharan Africa, similar studies have consistently documented limited male knowledge of infertility, particularly around causation and risk factors, with good knowledge proportions often falling below 60-70% (8,9,12). The relatively high knowledge levels observed in the present study may be partly attributable to high proportion of tertiary-educated respondents (78.2%), suggesting that the findings are more representative of educated urban men in the region than of the general male population, consistent with evidence that formal education is a robust predictor of reproductive health literacy (14).

The highest levels of correct knowledge were recorded for the definition of male infertility (91.1%) and the role of hormonal problems as a cause (91.1%), followed by the recognition that infertility is not exclusively a woman's problem (85.2%). The latter finding is particularly noteworthy given the deeply entrenched cultural attribution of infertility to women in Nigerian and broader sub-Saharan African contexts, where masculine identity is closely tied to fertility (4). Awareness of sexually transmitted infections (STIs) as a cause of infertility was moderate (73.4%), consistent with prior findings from Nigeria that suggest STI-related reproductive knowledge is improving but remains incomplete, especially in settings with limited sexual health education infrastructure (12).

A striking knowledge deficit concerned the effect of smoking on male fertility, which was correctly identified by only 49.8% of respondents, with 23.6% incorrectly stating it had no effect and 26.6% expressing uncertainty. This finding is consistent with global evidence demonstrating that while men may possess adequate conceptual knowledge of male infertility, awareness of modifiable lifestyle risk factors including smoking, alcohol use, and occupational toxin exposures remains substantially lower (7,8). This gap is clinically significant because smoking is one of the most comprehensively documented modifiable risk factors for male fertility, affecting sperm concentration, morphology, motility, and DNA integrity (15). Another concern from this knowledge gap is particularly the documented high prevalence of tobacco use among young men in northern Nigeria (16,17), however, public health interventions in northeastern Nigeria has historically prioritized communicable disease prevention, thus targeted reproductive health education addressing tobacco use and its fertility consequences is evidently lacking. This specific knowledge gap underscores the need for targeted health awareness campaigns within the region addressing modifiable lifestyle risk factors.

Overall, 58.7% of respondents demonstrated positive attitudes towards male infertility. While this represents a majority, it also indicates that over four in ten men hold neutral or negative attitudes, suggesting that attitudinal transformation remains a critical challenge. The mean attitude score of 1.64 ± 0.68 further reflects a moderately positive but far from uniformly supportive attitudinal landscape.

A finding worthy of note in regards to attitude is the complex picture where most respondents (88.2%) were willing to support a friend with infertility, indicating growing social acceptance at a personal level, however, over half of the respondents 50.2% of respondents agreed that male infertility reduces a man's social respect, a finding consistent with qualitative evidence from (18–20). This perception reflects a deep-seated social norm in which fertility and masculine worth are conflated, a pattern widely documented across Nigerian and sub-Saharan African societies (4,10). Such beliefs reinforce social stigma and can deter affected men from disclosing their condition or seeking formal evaluation, causing delayed or absent health-seeking behavior (5). Additionally, 20.7% of participants agreed that a man with infertility should feel ashamed, while only 41.0% disagreed outright. The substantial neutral response (38.4%) may indicate conflict or social desirability effects, with some respondents reluctant to explicitly endorse stigma but equally unwilling to reject it. This pattern of contested social norms is consistent with findings from comparable West African studies, where moderate stigma and shame persist even among otherwise knowledgeable respondents (9,10).

All 271 respondents (100%) expressed the intention to seek hospital care if diagnosed with infertility. While this represents a seemingly positive finding, it must be interpreted cautiously. Stated health-seeking intentions in self-administered surveys are well recognized to be subject to social desirability bias, and do not reliably predict actual behavior in practice (5). This limitation can be further seen that, despite the widely expressed willingness to seek hospital care, over one-third of participants (35.4%) would first consult traditional healers before accessing formal medical services, a pattern that is widespread across sub-Saharan Africa (21). This apparent inconsistency between universal hospital-seeking intention and the substantial proportion who would first engage traditional medicine reflects the complex, pluralistic health-seeking landscape of northeastern Nigeria, where traditional healing systems remain culturally legitimate and socially accessible, particularly in a region with documented healthcare infrastructure deficits (6). Prior consultation with traditional healers has been identified as a significant contributor to delays in reaching appropriate clinical care for infertility in sub-Saharan Africa, and the present findings suggest this pattern is also prevalent in northeastern Nigeria (10,11).

The primary barrier to hospital-seeking care was lack of knowledge (41.3%), followed by cost of treatment (26.2%), cultural beliefs (14.8%), stigma (11.8%), and distance to health facilities (5.9%). The predominance of knowledge deficit as a barrier is instructive, indicating that even among a relatively educated sample, gaps in awareness of available reproductive health services remain substantial. This may reflect the near-total absence of dedicated male fertility services in the public health sector across northeastern Nigeria, leaving many men unaware that such care exists or where it might be accessed. The finding that cost constitutes the second most commonly cited barrier reinforces existing evidence that financial constraints remain a principal impediment to reproductive healthcare utilization in low-resource settings (2,11). Male infertility evaluation, including semen analysis and hormonal assays, is rarely subsidized or covered by insurance schemes in Nigeria, placing it effectively out of reach for large proportions of the population (22). Health system strengthening efforts in the region must therefore address both supply-side gaps in service availability and demand-side barriers including affordability and community awareness.

Chi-square analysis identified educational attainment as a significant predictor of both good knowledge ($\chi^2 = 16.57$, $p < 0.001$) and hospital-seeking intention ($\chi^2 = 6.88$, $p = 0.009$). Tertiary-educated respondents were substantially more likely to demonstrate good knowledge (92.3%) than those with secondary education (70.4%). This association is consistent with the broader health literacy literature, which consistently identifies education as a fundamental determinant of reproductive health knowledge and service utilization (7,8). The lower knowledge proportion among secondary-educated men, while still above threshold, signals that men with lower educational attainment are a high-priority target for reproductive health education interventions. The parallel association between education and hospital-seeking intention further underscores the role of health literacy in shaping care pathways for male infertility.

Marital status was significantly associated with positive attitude ($\chi^2 = 4.69$, $p = 0.030$), with married men more likely to hold positive attitudes (66.1%) than single men (52.4%). This finding may reflect the lived experience of marital relationships in which fertility becomes a practical and emotionally proximate concern, prompting more nuanced or empathetic appraisals of infertility. Married men who have navigated fertility-related pressures within their relationships may develop a more pragmatic and less stigmatizing orientation towards the condition. This observation is consistent with similar studies in the region that identified personal proximity to infertility as a moderating factor in stigma reduction (10).

Although not the primary focus of multivariate analysis, the finding that the 18-24 age group achieved 100% good knowledge is noteworthy. This may reflect the increasing penetration of digital health information among younger cohorts through social media and internet platforms a plausible explanation given the online recruitment methodology of this study. Targeted digital health education initiatives directed at young men may therefore be a particularly high-return investment for male reproductive health promotion in the region.

Limitations

This study has several limitations that must be acknowledged. The use of convenience sampling limits the representativeness and generalizability of the findings to the broader male population of northeastern Nigeria. The relatively high educational attainment of respondents (78.2% tertiary) suggests a sampling bias toward more educated, likely urban, participants, which may have inflated knowledge scores. The cross-sectional design precludes causal inference. Furthermore, the self-reported nature of health-seeking intentions may be subject to social desirability bias, particularly given the culturally sensitive nature of male infertility in this context. The inclusion of some ambiguous questions might have affected some attitudinal and health seeking responses. Future studies should employ probability-based sampling strategies, closed-ended-questions and include qualitative components to enrich understanding of the psychosocial dimensions of male infertility in this setting.

5. Conclusion

This study demonstrates that while men in northeastern Nigeria generally possess reasonable knowledge of male infertility, critical gaps persist—particularly regarding the role of modifiable risk factors such as smoking. Attitudinal constructs of shame and social stigma remain prevalent and represent formidable barriers to care-seeking, even among men who express a clear intention to access hospital services. The findings underscore the urgent need for targeted, culturally sensitive reproductive health education program that address both knowledge deficits and deep-seated stigma associated with male infertility in this region. Health systems strengthening, cost reduction through insurance coverage, and community-based outreach are equally necessary to translate expressed health-seeking intentions into actual clinical engagement. These efforts must be underpinned by robust, inclusive research involving representative samples from all subpopulations of northeastern Nigeria, including rural and internally displaced communities.

Recommendation

Taken together, the findings of this study have several concrete implications. First, health education campaigns addressing male infertility in northeastern Nigeria should prioritize lifestyle risk factors, particularly tobacco use, in their messaging. Second, interventions to reduce stigma should leverage the observed willingness to support peers by using community-level male champions and normalizing care-seeking through positive social norms frameworks. Third, the substantial proportion considering traditional healers first suggests the need for integrated care pathways that engage traditional health practitioners rather than dismissing them, potentially enabling earlier referral to formal services. Finally, cost reduction strategies including subsidized semen analysis at public health facilities and integration of male fertility screening into existing reproductive health services should be put in place to address economic barriers.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no competing interests.

Statement of informed consent

All participants provided informed consent. This study used an electronic based questionnaire thus no ethical approval was obtained

Availability of Data and Materials

The datasets used in this study are available from the corresponding author on reasonable request.

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Authors' Contributions

EAK and CAA conceptualized the study, CAA and KAZ drafted the introduction and methodology, all authors collected data, CAA, YI and AKF analyzed the data, all the authors interpreted the analyses, EAK, CAA, and OE wrote the discussion, all the authors read and approved the manuscript for submission.

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