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RESEARCH ARTICLE OPEN ACCESS

The pitfalls in management of testicular torsion: A Nigerian urban cross-sectional study on knowledge and practice from the general medical practitioners' perspective

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Abstract
Objectives: In Nigeria, the management of testicular torsion is often followed by an avoidably high rate of testicular loss, and patients usually present first to general medical practitioners; hence, this study aims to assess general medical practitioners' knowledge and practice relating to the management of testicular torsion.
Methods: This study was a cross-sectional study of general medical practitioners in Benin City from November 2024 to April 2025. A pretested self-administered structured questionnaire on knowledge and practice of testicular torsion was used for this study. A score of 70% was considered good for knowledge and practice. Data was analysed using SPSS version 27.0, categorical data presented in proportion, while continuous data in mean with standard deviation.
Results: Eighty-three respondents participated, with an age range between 21-50 years; the majority, 57.8% were in the 31-40 range. The majority, 40.7% had 0-5years of practice experience. Overall, the good knowledge score was 39.8% while the good practice score was 46%. No association was found between sociodemographic factors, years of practice and knowledge, as there were also no independent predictors of good knowledge. However, younger age and years of practice of less than 10 years were associated with quality practice. No predictors of quality practice, although the odds were greater with younger age and fewer years of practice.
Conclusion: The knowledge and quality of practice of general practitioners in the management of testicular torsion were below average, with younger age and years of practice less than 10 years determining good knowledge and quality practice.

Keywords: Knowledge, practice, predictors, testicular torsion, urologic emergency

Plain English Summary

Testicular torsion is a medical emergency in which the testicle twists, cutting off its own blood supply. If treatment is delayed for too long, the affected testicle can die and must be removed. This condition affects boys and young men, and quick action, usually surgery within six hours, is essential to saving the testicle. This study examined the knowledge and practice of 83 general medical practitioners in two private and public health facilities in Benin city on their experience with testicular torsion between November 2024 and April 2025 by interviewing them. The goal was to understand how they approached management of young men with sudden testicular pains, how long it took patients to get treatment, why delays happened, and what the outcomes were and if the right treatment were given. Majority of the doctors were aged between 31-40 years. Majority had practiced for between 0-5 years. The score accepted as good knowledge and practice of testicular torsion was 70%. Only 39.8% had good knowledge, while 46% were managing testicular torsion. In the right way This finding shows that it is possible for general medical practitioners to cause delays in giving appropriate treatment and giving

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rise to cutting off blood supply to the affected testis. Ultimately leading to death of the testis and its eventual removal.
The study also found out that younger doctors with fewer years of practice tend to have better knowledge of testicular torsion and apply this in their practice more often. It also shows that good knowledge almost always meant better practice. The study highlights that many cases of testicular loss could be prevented with faster recognition and referral. To improve outcomes, the authors recommend thorough education of medical students about testicular torsion in medical schools. public education for healthcare providers about the signs of testicular torsion and the need to seek immediate care. They also call for training and awareness among frontline health workers to quickly recognize torsion and refer patients without delay.
In simple terms, the sooner a boy or young man with sudden testicular pain reaches the right hospital, the more likely his testicle can be saved. This study shows that better awareness and faster action could significantly reduce preventable testicular loss in Nigeria.

Background
The incidence of testicular torsion worldwide in the literature has been put at 1 per 4000 in males less than 25 years old (1), while a Nigerian study put the incidence at 2.7 cases per 100,000 (2). Its incidence in Nigeria is lower than in Western countries. Early presentation and timely surgical intervention are imperative to preserving the testes, therefore preventing testicular loss (1). If surgical intervention is carried out within 6 hours of the onset of symptoms, the salvage rate is about 90%; it is 50% at 12 hours, and it becomes about 10% at 24 hours (3, 4).
Testicular torsion is considered a surgical emergency and a race against time (5). It is critical to take this into cognisance for a successful outcome, to reduce the rate of testicular loss. The testicular loss rate in sub-Saharan Africa has been put at 46.4%, amongst several reasons adduced for this rate of loss were diagnostic erraticism (6), problems of triage, diagnosis and decision making (7). The burden of misdiagnosis by primary health physicians was put at 48.4%, the commonest misdiagnosis being acute epididymoorchitis (8). Ultimately, delays in referral and surgical intervention ensue (9). To obviate the time-dependent loss, researchers have advocated continuing medical education programs for physicians, and emphasis should be placed on timely and prompt referral of young patients with acute scrotal pain to the urologist (3, 8, 10, 11).
Taking into consideration the testicular loss rate following testicular torsion and the burden of misdiagnosis in sub-Saharan Africa, it is pertinent, therefore, to assess the knowledge and practice of general medical practitioners as 1st tier of medical professionals in the management of testicular torsion.

Materials and Methods
Study setting and study population
This study was carried out amongst general medical practitioners in both public and private health facilities in Benin City, Edo State, Nigeria. This study was carried out from November 2024 to April 2025.

Study design
The study was a prospective cross-sectional study
Sample size determination
Using sample size for cross cross-sectional study:
$n= (Z^2 *P *[1-P])/d^2$ (12).
Where:
n= sample size
Z = 1.96 (@95% confidence interval)
P = 0.025% being the proportion of knowledge deficit from the pretest survey carried out in a tertiary hospital
d =margin of error of 5% (0.05)
$n = (1.96^2 *0.05 * 0.95) /0.05^2$
= 73
With an attrition rate of 10% = 7.3
n = 80.3
approximately, minimum sample size, n = 80

Sampling and recruitment of study participants
A purposive sampling technique(a non-probability sampling technique, based on the fact that participants in the study require specific characteristic, that is being general practitioners in this recognized facilities) was used to select 2 private and public health facilities each from the three metropolitan local government of Benin city, these health facilities are known to have a good number of general practitioners which were the target population and relevant to this study. From each of the healthcare facilities selected, general medical practitioners were recruited consecutively, and a self-administered structured questionnaire that was pretested was filled out by participants. Validity was ensured by using the Cronbach alpha coefficient with a score of 0.74.

Inclusion and exclusion criteria
General practitioners, including residents and consultant family physicians and medical officers in selected health institutions who gave informed consent, were selected for this study, while

residents and consultants in other specialties, especially surgery-related departments, were excluded from the study, including those who declined to give consent to participate.

Methodology

A structured questionnaire divided into sections; section A was on the patient's sociodemographic characteristics, while section B was on knowledge and section C on practice. There were 20 questions on knowledge; each correct answer attracted a score of 1, and a wrong answer attracted a score of 0. The practice section had seven questions, with the correct answer attracting a score of 1 and an incorrect answer attracting a score of 0. The score for each session was aggregated and scored in percentages, with a score 70% considered good knowledge or practice, respectively. A score of 70 was predefined as a good score or good practice, reflecting the need for mastery of key competencies for timely diagnosis and referral of testicular torsion. This threshold aligns with conventional standard-setting practices for acute care assessment and has been used in studies on emergency medicine competence (13). These questionnaires were administered consecutively to participants who met the inclusion criteria and gave informed consent.

Data analysis

Data collected using a structured questionnaire were collated and analysed using IBM SPSS version 27.0. Continuous data were presented as mean and standard deviation, while categorical data were presented in proportion. The knowledge and practice of participants were assessed by scoring each parameter with a score of 1, and an overall score of 70% considered good knowledge or good practice. Association between independent variables such as sociodemographic factors and years of practice and dependent variables such as knowledge and practice were assessed using the student chi-squared test or Fisher's exact, where appropriate. Binary logistic regression was used to assess predictors of knowledge and practice. A p-value less than 0.05 was considered statistically significant.

Results

Table 1 below shows a total of 83 respondents who participated in the study. The age distribution showed that a little above half, 57.8% (n=48), were between 31 and 40 years, followed by 21–30 years, 30.1% (n=25) and 41–50 years, 12.1% (n=10).

In terms of gender, 56 respondents (67.5%) were male, while 27 (32.5%) were female.

Table 1: Socio-Demographic Characteristics of Study Participants

Socio-demographic Characteristics	Frequency (n = 83)	Per cent (%)
Age Group (Years)		
21-30	25	30.1
31-40	48	57.8
41-50	10	12.1
Sex		
Male	56	67.5
Female	27	32.5

Figure 1 below shows that a higher proportion of respondents, 48.2% (n=40), had between 0–5 years of practice experience. This was followed by those with 6–10 years, 28.9% (n=24) and 11–15 years, 15.7% (n=13) of experience.

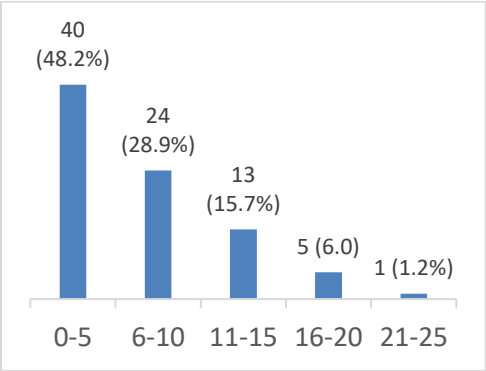


Figure 1: Respondents' Duration of Practice

Most respondents demonstrated awareness of key clinical features and the urgency associated with testicular torsion. Nearly all participants (98.8%) correctly identified it as a medical emergency, and all respondents (100.0%) knew that individuals with suspected torsion should present immediately and that the condition is painful.

However, only 37.3% correctly recognised that testicular torsion is not pathogenic, while 62.7% held incorrect beliefs about its aetiology. In terms of immediate action, 96.4% indicated appropriate steps would be taken in cases of suspected torsion.

When asked about the cause, 81.9% correctly identified most cases as idiopathic, and 89.2% accurately described the nature of its symptoms. Knowledge of the age group at increased risk was less robust, with only 42.2% responding correctly.

In terms of treatment approach, 72.3% of respondents understood that analgesics or antibiotics alone are not appropriate for managing testicular torsion, while 27.7% incorrectly endorsed such treatments. This is shown in Table 2.

Table 2: Knowledge of Testicular Torsion among Respondents

Variables	Responses (n=83) Freq. (%) Correct	Incorrect
Testicular torsion is pathogenic	31 (37.3)	52 (62.7)
Testicular torsion is an emergency	82 (98.8)	1 (1.2)
If testicular torsion is suspected, when should they present	83 (100.0)	0 (0.0)
Testicular torsion is a painful condition	83 (100.0)	0 (0.0)
Immediate action is taken in cases of testicular torsion	80 (96.4)	3 (3.6)
Most cases are idiopathic	68 (81.9)	15 (18.1)
Nature of testicular torsion symptoms	74 (89.2)	9 (10.8)
Age is at increased risk of testicular torsion	35 (42.2)	48 (57.8)
Analgesics or antibiotics for testicular torsion	60 (72.3)	23 (27.7)
Aware of the golden hour for intervention	74 (89.2)	9 (10.8)
Appropriate time for medical intervention	72 (86.7)	11 (13.3)
Surgery is indicated for treatment	75 (90.4)	8 (9.6)
Testicular damage as a complication of testicular torsion	67 (80.7)	16 (19.3)
Aware of the risk of repeat torsion	73 (88.0)	10 (12.0)
Appropriate surgical intervention on the affected side	49 (59.0)	34 (41.0)
Aware that the contralateral testis can be affected	49 (59.0)	34 (41.0)
Indication of surgical indication for the unaffected side	50 (60.2)	33 (39.8)
Appropriate surgical intervention on the unaffected side	54 (65.1)	29 (34.9)

Respondents demonstrated varying levels of awareness regarding the risk factors associated with testicular torsion. The most recognised risk factor was undescended testis, identified by 63.9% of participants, followed closely by clapper bell deformity (62.9%) and male sex (60.2%). More than half (54.2%) acknowledged age as a contributing risk factor.

Awareness was lower for anatomical variations such as long mesorchium (43.4%) and lie of the testis (26.5%). This activity is shown in Table 3.

Table 3: Risk Factors for Testicular Torsion

Risk Factors	(n=83) Frequency	Percent
Undescended testis	53	63.9
Clapper bell Deformity	52	62.9
Sex	50	60.2
Age	45	54.2
Long Mesorchium	36	43.4
lie	22	26.5

Understanding of the etiological factors behind testicular torsion varied significantly among respondents. Trauma was the most recognised cause, with 75.9% correctly identifying it. Vigorous exercise was acknowledged by 48.2% of participants, while less than one-third (28.9%) correctly associated tumours with the condition.

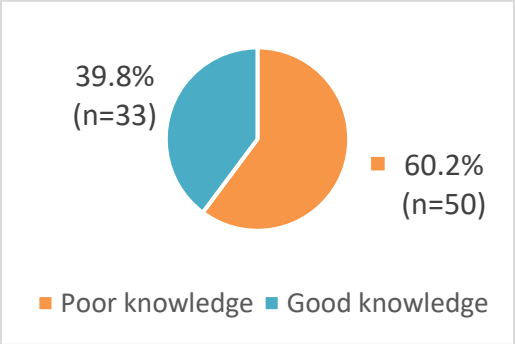
Awareness was notably low regarding other potential triggers: only 18.1% identified cold exposure as a possible factor, and just 9.6%

recognised puberty as a contributing cause, as shown in Table 4.

Table 4: Possible Aetiology for Testicular Torsion reported by Respondents (n=83)

Aetiology	Frequency	Percent
Trauma	63	75.9
Vigorous Exercise	40	48.2
Tumors	24	28.9
Cold	15	18.1
Puberty	8	9.6

The pie chart shown in Figure 2 below illustrates the knowledge of testicular torsion among study participants, with 39.8% (n=33) having good knowledge, while 60.2% (n=50) had poor knowledge. A score of 70% and above was considered a good knowledge score.



Good Knowledge: a score of ≥70

Figure 2: Overall knowledge category of Testicular Torsion among Respondents

Most respondents (71.1%) reported having witnessed a case of testicular torsion. Among these 59 individuals, a high index of suspicion was recorded in 84.7%, indicating appropriate clinical awareness of the condition.

In terms of initial management, only 10.2% reported using antibiotics and analgesics alone. Regarding diagnostic imaging, 20.3% of respondents requested an ultrasound as part of the management process. However, 79.7% did not rely on ultrasound, likely due to the time-sensitive nature of the condition.

Of those who requested an ultrasound, only 44.1% received the report immediately, while 20.3% received it within an hour, and 35.6% had to wait more than one hour, highlighting potential delays in diagnostic pathways.

When referring cases of suspected torsion, 66.1% of respondents made immediate referrals, 22.0% referred within four hours, and 11.9% delayed referral for more than four hours, which could negatively impact testicular salvage rates.

Follow-up outcomes were monitored by 64.4% of respondents. This is illustrated in Table 5 below.

Table 5: Management of Testicular Torsion among Respondents

Practice exhibited by respondents	Frequency (n = 83)	Per cent (%)
Witnessed a case of Testicular Torsion		
Yes	59	71.1
No	24	28.9
Had a high Index of suspicion (n=59)		
Yes	50	84.7
No	9	15.3
Managed with Antibiotics and Analgesics only (n=59)		
Yes	6	10.2
No	53	89.8
Request for Ultrasound for Management (n=59)		
Yes	12	20.3
No	47	79.7
Duration of Time to Obtain USS Report (n=59)		
Immediately	26	44.1

Within 1 hour	12	20.3
More than 1 hour	21	35.6
Length of Time for a Referral (n=59)		
Immediately	39	66.1
Within 4 hours	13	22.0
More than 4 hours	7	11.9
Follow-up Outcome (n=59)		
Yes	38	64.4
No	21	35.6

The pie chart in Figure 3 below illustrates the management of testicular torsion among study participants who had previously managed testicular torsion; 46% had good management practice, with poor practice noted in 54% of persons who previously managed the condition. A score of 70% and above was considered a good practice score.

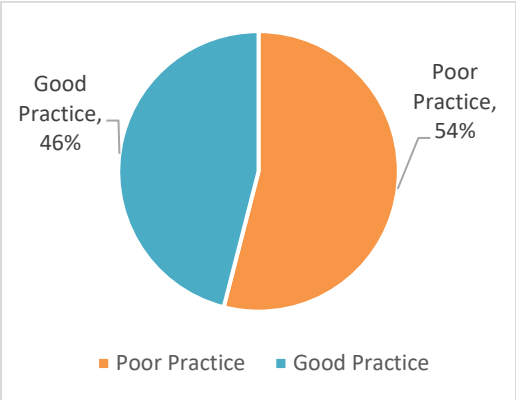


Figure 3: Overall Management of Testicular Torsion among Respondents
Good practice: a score of >70

The study found no statistically significant associations between respondents' socio-demographic or professional characteristics and their level of knowledge on testicular torsion. Although respondents aged 31–40 years had the highest proportion of good knowledge (43.7%), the association between age group and knowledge level was not significant (p = 0.447). Years of practice did not show a significant relationship with knowledge level (p = 1.000), though slightly higher proportions of good knowledge were observed among those with 10 years or more of experience (42.1%). This is illustrated in Table 6 below.

Table 6: Sociodemographic Characteristics and Knowledge of Testicular Torsion among Respondents

Variable	Good Knowledge (n=33) Freq. (%)	Poor Knowledge (n=50) Freq. (%)	Test Statistic	p-value
Age group (years)				
21-30	10 (40.0)	15 (60.0)	χ^2=1.950	0.447
31-40	21 (43.7)	27 (56.3)		
41-50	2 (20.0)	8 (80.0)		
Sex				
Male	19 (45.2)	23 (54.8)	χ^2 = 1.066	0.372
Female	14 (34.1)	27 (65.9)		
Duration of Practice				
<10 years	25 (39.1)	39 (60.9)	Fishers Exact Test = 0.057	1.000
10 years or more	8 (42.1)	11 (57.9)		

A binary logistic regression analysis was conducted to identify factors associated with knowledge of testicular torsion among respondents. Respondents aged 31–40 years had higher odds of demonstrating correct knowledge compared to those aged 41–50 years (OR = 4.06, 95% CI: 0.619–26.630; p = 0.144), followed by those

aged 21–30 years (OR = 3.45, 95% CI: 0.370–32.186; $p = 0.277$).
Male respondents were more likely to have correct knowledge than females (OR = 1.64, 95% CI: 0.576–4.680; $p = 0.353$).
Interestingly, those with less than 10 years of practice were less likely to demonstrate correct knowledge than those with longer practice durations (OR = 0.39, 95% CI: 0.097–1.588; $p = 0.190$), though this result was not statistically significant. Overall, none of the demographic or professional characteristics analysed were significant predictors of knowledge regarding testicular torsion. This is illustrated in Table 7 below.

Table 7: Predictors of Knowledge of Testicular Torsion among Respondents

Variables	B (regression coefficient)	p-value	Odds ratio	95% C.I. for Odds ratio	
				Lower	Upper
Age group (years)					
21-30	1.238	0.277	3.450	0.370	32.186
31-40	1.401	0.144	4.060	0.619	26.630
41-50*			1		
Sex					
Male	0.496	0.353	1.642	0.576	4.680
Female*			1		
Duration of Practice					
<10 years	-0.934	0.190	0.393	0.097	1.588
10 years and more*			1		

*Reference category, R^2 (coefficient of determination) = 6.0% to 8.2%

Associations between selected socio-demographic and professional variables and good clinical practice in the management of testicular torsion were explored in Table 8. Statistically significant relationships were found with both age group and duration of practice.
Respondents aged 21–30 years were significantly more likely to demonstrate good management practices compared to older age groups. Specifically, 69.2% of respondents in this age category reported good practice, as opposed to 50.0% among those aged 31–40 years, and only 12.5% among those aged 41–50 years ($p = 0.038$).
Duration of practice was also significantly associated with the quality of practice. Among those with less than 10 years of clinical experience, 61.0% demonstrated good practice, compared to only 22.2% of those with 10 years or more ($p = 0.010$).
Other variables, including sex, were not significantly associated with clinical practice. While good practice was reported more frequently among male respondents (53.7%) than females (38.9%), this difference was not statistically significant ($p = 0.399$).
Although respondents with good knowledge of testicular torsion were more likely to demonstrate good practice (59.3%) compared to those with poor knowledge (40.6%), the association did not attain statistical significance ($p = 0.195$).

Table 8: Sociodemographic Characteristics and Management of Testicular Torsion among Respondents

Variable	Good Practice (n=29) Freq. (%)	Poor Practice (n=30) Freq. (%)	Test Statistic	p-value
Age group (years)				
21-30	9 (69.2)	4 (30.8)	Fishers Exact	0.038
31-40	19 (50.0)	19 (50.0)	Test =6.250	
41-50	1 (12.5)	7 (87.5)		
Sex				
Male	22 (53.7)	19 (46.3)	χ^2 =1.092	0.399
Female	7 (38.9)	11 (61.1)		
Duration of Practice				
<10 years	25 (61.0)	16 (39.0)	χ^2 = 7.516	0.010
10 years or more	4 (22.2)	14 (77.8)		

Knowledge of Testicular Torsion				
Good	16 (59.3)	11 (40.7)	$\chi^2 = 2.035$	0.195
Poor	13 (40.6)	19 (59.4)		

A binary logistic regression analysis was conducted to identify independent predictors of good clinical management of testicular torsion among respondents shown in Table 9. Although no predictor reached statistical significance, certain trends were noted.

Respondents aged 21–30 years had increased odds of good management practice compared to those aged 41–50 years (OR = 7.49; 95% CI: 0.330–170.102; $p = 0.206$). Similarly, those aged 31–40 years had higher odds (OR = 2.63; 95% CI: 0.197–35.171; $p = 0.465$), though neither association was statistically significant.

Clinicians with less than 10 years of experience also had higher odds of good practice (OR = 3.87; 95% CI: 0.718–20.811; $p = 0.115$) compared to their more experienced counterparts. This supports earlier bivariate findings but did not attain statistical significance in the multivariate model.

Sex was not significantly associated with management practices. Male respondents had slightly higher odds of good practice (OR = 1.26; 95% CI: 0.322–4.952; $p = 0.738$) compared to females.

Interestingly, poor knowledge of testicular torsion was associated with lower odds of good management (OR = 0.46; 95% CI: 0.141–1.476; $p = 0.190$), although this also did not reach statistical significance.

Table 9: Predictors of Management of Testicular Torsion among Respondents

Variables	B (regression coefficient)	p-value	Odds ratio	95% C.I. for Odds ratio Lower	Upper
Age group (years)					
21-30	2.014	.206	7.491	0.330	170.102
31-40	0.967	0.465	2.629	0.197	35.171
41-50*			1		
Sex					
Male	0.233	0.738	1.263	0.322	4.952
Female*			1		
Duration of Practice					
<10 years	1.352	0.115	3.865	0.718	20.811
10 years and more*			1		
Knowledge of Testicular Torsion					
Good*			1		
Poor	-0.786	0.190	0.456	0.141	1.476

Discussion

Testicular torsion is regarded as a surgical emergency, which occurs following rotation of the spermatic cord and vascular pedicle of the testis along its axis (14). The rate of testicular loss is quite high in sub-Saharan Africa, attributable to delayed presentation, misdiagnosis and delay in surgical intervention (8, 9), which are, albeit modifiable factors, hence assessing knowledge and practice of firsthand medical practitioners attending to this patient cannot be overemphasised.

Most (87.9%) of the respondents in this study were aged 40 or less, and it parallels the years of practice of these general medical practitioners, as most (77.1%) of the respondents had practised for 10 years or less. Participants in this study had their knowledge assessed, including presenting symptoms, examination findings, risk factors, possible aetiologies and management of testicular torsion. The overall knowledge of participants on testicular torsion was poor, as only 39.8% had adequate knowledge of testicular torsion in this study, similarly practice by majority(54%) of the respondents were scored poor, this may be adjudged as partly responsible for the outcome of several studies that reported orchidectomy rate of 25%, 40.9%, 61.4%, 54.5% and 15.8% in a series of published data from studies carried out in Nigeria (9, 15, 16, 17, 18). In a recent case report, there was a second episode of testicular torsion in the contralateral pexed testis; however, patient delay coupled with misdiagnosis and delayed referral prompted a second orchidectomy, leading to bilateral testicular loss and eventual hypogonadism (19). The rate of orchidectomy is highly variable; in some Western countries, it is considerably lower than reported in Nigeria. Studies from France report a 7.6% orchidectomy rate (20). Level of referral was mostly attributed to this, as orchidectomy rate was said to be higher when

referral was from primary health facility, followed by general hospitals, then intra-hospital referrals, than when patients presented to the urologist directly at the emergency room in tertiary hospitals (14). Several authors have advocated continuing medical education for medical practitioners on the diagnosis and management of testicular torsion (15, 16, 17, 18). Studies by Ogbetere et al (11) and Munyirilrungu et al (21) demonstrated poor knowledge of healthcare practitioners of the concept of testicular torsion, diagnosis and management, which corroborated findings in this study.

There was no significant association between sociodemographic characteristics, years of practice with knowledge of testicular torsion, but it was noted that those aged between 31-40 had a slightly higher knowledge, which was not statistically significant (p =1.000). No reason could be adduced for this. Using binary logistic regression to assess independent variables that could predict knowledge of testicular torsion, none were statistically significant; however, respondents between 31-40 had a higher odds of demonstrating correct knowledge (OR =1.83,95% CI: 0.619-26.630; P= 0.144). The reasons for these are not clear. Interestingly, those with less than 10 years of practice were less likely to demonstrate correct knowledge about testicular torsion than those with longer years of practice (OR =0.39,95%CI: 0.097-1.588; p = 0.190), though not statistically significant, these may be due to the clinical experience that comes with years of practice. However, there seemed to be a significant association between age and quality of practice in management of testicular torsion (p=0.0038). Respondents aged 21-30 years, 69.2% of them were significantly more likely to demonstrate quality management practices compared to the older age groups. This may have been because they are better accustomed to modern practice guidelines, considering their younger age. Similarly, it was also noted that general practitioners with fewer years of practice, notably those with less than 10 years of practice, were more likely to demonstrate significantly better practice (p =0.010); among them 61% demonstrated quality practice. This group of clinicians are still in tune with their teachings as undergraduates. They are also more likely to be in postgraduate training with exposure to clinical rotations in surgery. A binary regression logistic regression analysis conducted revealed no significant predictor of good clinical management practice but the trend demonstrated that respondent aged 21-30 had increased odds of good management compared with these aged 41-50 (OR=7.49;95%CI:0.330-170.102; P= 0.206), similar findings were noted for these 31-40 who had higher odds compared to 41-50 age group (OR=2.63;95%CI:0.197-35.171; P=0.465). In terms of years of practice, general medical practitioners with less than 10 years of practice had higher odds of good practice (OR=3.87;95%CI:0.718-20.811; P=0.115). A search through the literature, though limited, corroborated the fact that physicians who have been in practice for more years may be less likely to deliver quality care (22). This study has shown that there is some relationship between good knowledge and good practice, and this was corroborated by a systematic review carried out, which revealed that older physicians possess less factual knowledge and are less likely to adhere to the standard of care (23).

Conclusion

The findings from this research work have shown that general practitioners demonstrate limited knowledge, and this reflects on the quality of practice in the management of testicular torsion. These factors are likely to lead to misdiagnosis and delay in surgical intervention in Nigeria. The study also revealed that younger age of practitioners and fewer years of practice, less than 10 years, are likely to lead to better practice in the management of torsion.

It is therefore recommended that continuing medical education amongst general medical practitioners on management of testicular torsion should take precedence, undergraduate clinical curriculum must emphasise management of testicular torsion. It is also imperative to develop a practice guideline on referral patterns and management of testicular torsion.

Study Limitations

This study is limited by its small sample size. Also, the questionnaire for the study was developed from the literature; therefore was not an adapted validated questionnaire from previous studies, as there was a dearth of studies on this subject matter.

List of Abbreviations

SPSS: Statistical Package for the Social Sciences
OR: Odds Ratio
CI: Confidence Interval
USS: Ultrasound Scan
LGA: Local Government Area
CME: Continuing Medical Education

Declarations

Ethical approval and consent to participate

Institutional ethical approval was sought and approval granted with protocol number: ADM/E22/A/VOL.VII/14831265

Consent for publication
All the author(s) gave consent for the publication of the work under the Creative Commons Attribution-Non-Commercial 4.0 license.

Availability of data and materials
The data and materials associated with this review will be made available by the corresponding author upon reasonable request.

Conflict of Interest
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Authors' Contributions
OE: Conceptualization, design, data acquisition and analysis, drafting of manuscript, critical review of manuscript for important intellectual content and final approval of draft for submission
OOJ: Data acquisition, final approval of the draft for submission

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