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Impact of Nurse-led Educational Intervention on Knowledge of Testicular Cancer and Self-Examination among Male Residents in Nigeria: A Quasi-experimental Study

Segun Bolarinwa and Ayobami Tolu Akinsiyakan

Faculty of Nursing Science, University of Medical Sciences, Ondo City, Nigeria.

***Correspondence**
Segun Bolarinwa
Faculty of Nursing Science, University of Medical Sciences, Ondo City, Nigeria.
E-mail: oluwaseunbolarinwa@gmail.com or obolarinwa@unimed.edu.ng
Tel: +2348060598781).

ABSTRACT

Background: *Testicular cancer predominantly affects young men, with early detection through testicular self-examination (TSE) being crucial for improved outcomes. This study evaluated the effectiveness of a nurse-led educational intervention in improving knowledge of testicular cancer and TSE among male residents in Oke-Ogba community, Nigeria.*
Methods: *A quasi-experimental one-group pre-test/post-test design was conducted among 116 male residents aged 15-45 years. Data were collected using a validated questionnaire assessing knowledge of testicular cancer and TSE before and after the educational intervention. Analysis used paired t-tests with significance set at $p<0.05$.*
Results: *Mean age of participants was 29.70±7.34 years, with 80.2% having tertiary education. Knowledge of testicular cancer increased significantly from 50% pre-intervention to 98.3% post-intervention ($p<0.001$). TSE knowledge improved from 63.8% to 100% post-intervention. Mean knowledge scores increased from 7.49±1.67 to 8.90±0.53 for testicular cancer and from 13.47±2.98 to 15.98±0.13 for TSE.*
Conclusion: *The nurse-led educational intervention significantly improved participants' knowledge of both testicular cancer and TSE, suggesting its effectiveness as a strategy for promoting early detection practices among at-risk populations.*

Keywords: Testicular cancer, Testicular self-examination, Health education, Men's health, Cancer prevention

INTRODUCTION

Testicular cancer represents a significant health concern for young men, particularly those aged 15-45 years.[1] While it accounts for only 1-2% of all male cancers globally, its incidence has been rising by approximately 0.8% annually over the past decade. The World Health Organization reports approximately 50,000 new cases and 10,000 deaths yearly from testicular cancer worldwide.[2]

Early detection through regular testicular self-examination (TSE) significantly improves prognosis, with survival rates reaching 96% when detected early.[3] However, awareness and practice of TSE remain suboptimal, particularly in resource-limited settings like

Correspondence: Segun Bolarinwa; E-mail: obolarinwa@unimed.edu.ng

Nigeria.[4] Recent studies indicate that despite the simplicity of TSE, many men lack adequate knowledge of the procedure or face barriers to regular practice.[5]

The role of targeted educational interventions in improving health behaviours has been well-documented, yet few studies have evaluated the effectiveness of nurse-led education specifically for testicular cancer awareness in Nigerian communities.[6-8] This study aimed to assess the impact of a structured educational intervention on knowledge levels regarding testicular cancer and TSE among male residents in Oke-Ogba community, Akure, Nigeria.

METHODS

Study Design and Setting

A quasi-experimental one-group pre-test/post-test design was employed between January and March 2024. The study was conducted in Oke-Ogba community, Akure South Local Government Area, Ondo State, Nigeria.

Participants and Sampling

Male residents between the ages of 15 and 45 years were recruited for the study using a convenience sampling technique. This method was chosen due to its practicality and ease of access to potential participants within the study area. The sample size was determined using the Cochran formula for sample size estimation for proportions in large populations:

$$n = \frac{Z\alpha^2 pq}{d^2}$$

In this formula, Zα represents the critical value of the standard normal distribution at a 95% confidence level (1.96), pp is the estimated population proportion (set at 0.5 to ensure maximum sample size and account for variability), q=1−p=0.5q = 1 - p = 0.5, and dd is the desired precision (set at 0.09).

To ensure practicality in data collection, the final sample size was adjusted to **116 participants**.

Eligibility for participation was restricted to individuals who identified as male, were between the ages of 15 and 45 years, and were permanent residents of the selected study community.

Intervention and Data Collection

The educational intervention was designed to improve participants' knowledge of testicular cancer and testicular self-examination (TSE). It comprised several components aimed at enhancing engagement and comprehension. First, structured presentations were delivered, covering essential information about testicular cancer, its risk factors, signs and

symptoms, as well as the importance of early detection. This was followed by practical demonstrations of the TSE technique using anatomical models, providing participants with hands-on experience. To reinforce learning, interactive question-and-answer sessions were conducted, allowing participants to seek clarification and deepen their understanding. Additionally, educational materials summarizing key points from the sessions were distributed for participants to review at their convenience.

Data were collected using a validated semi-structured questionnaire. The instrument was designed to assess three key areas: demographic characteristics of the participants; knowledge of testicular cancer, assessed through 9 targeted items; and knowledge of TSE, evaluated using 16 specific items. The questionnaire demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.80, indicating reliable measurement across the assessed domains.

Statistical Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS), version 23. To evaluate the effect of the educational intervention, paired sample *t*-tests were employed to compare participants' knowledge scores before and after the intervention. A p-value of less than 0.05 was considered indicative of statistical significance.

Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the University of Medical Sciences, Ondo State (Protocol Number: NHREC/TR/UNIMED-HREC-Ondo St/22/06/21). All participants were provided with detailed information about the study's purpose, procedures, and their rights. Written informed consent was obtained from each participant prior to data collection, and participation was entirely voluntary. Confidentiality and anonymity were assured throughout the research process.

RESULTS

Participant Characteristics Mean = 29.70 ± 7.336. The study included 116 male participants with mean age 29.70±7.34 years. Most participants (80.2%) had tertiary education, and 43.1% were civil servants. The sample comprised primarily Yoruba ethnicity (74.1%) and Christian religion (77.6%).

Correspondence: Segun Bolarinwa; E-mail: obolarinwa@unimed.edu.ng

Table 1 Socio-demographic Characteristics of Respondents (N=116)

Socio-demographic Characteristics	Frequency	Percent
Age		
11-20 years	06	5.2
21-30 years	69	59.5
31-40 years	33	28.4
41-50 years	08	6.9
Marital status		
Single	56	48.3
Married	54	46.5
Divorced	06	5.2
Religion		
Christianity	90	77.6
Islam	20	17.2
Traditional	06	5.2
Ethnicity		
Yoruba	86	74.1
Igbo	28	24.1
Hausa	02	1.8
Educational Level		
Primary	03	2.6
Secondary	20	17.2
Tertiary	93	80.2
Occupation		
Unemployed	28	24.1
Civil servant	50	43.1
Artisan	20	17.2
Trader	18	15.6

Pre-intervention, 50% demonstrated good knowledge of testicular cancer. Post-intervention, this increased to 98.3%. Mean knowledge scores improved significantly from 7.49±1.67 to 8.90±0.53 ($p<0.001$).

Table 2: Pre- and Post-Intervention Knowledge of Testicular Cancer (n=116)

Descriptions	Responses	Pre Intervention	Post Intervention
Testicular Cancer is an uncontrolled growth of abnormal cells in the testes	Yes	103 (88.8%)	115 (99.1%)
	No	13 (11.2%)	01 (0.9%)
Testicular Cancer is the most prevalent cancer in your age group	Yes	73 (62.9%)	112 (96.6%)
	No	43 (37.1%)	04 (3.4%)
Testicular cancer cannot kill	Yes	16 (13.8%)	01 (0.9%)
	No	100 (86.2%)	115 (99.1%)
Testicular cancer can never be treated	Yes	39 (33.6%)	01 (0.9%)
	No	77 (66.4%)	115 (99.1%)
Men aged below 45 year and above are not at risk of having testicular cancer	Yes	33 (28.4%)	01 (0.9%)
	No	83 (71.6%)	115 (99.1%)
There is presence of lump in the testes in testicular cancer	Yes	103 (88.8%)	114 (98.3%)
	No	13 (11.2%)	02 (1.7%)
There is discomfort or pain in the testes in testicular cancer	Yes	104 (89.7%)	115 (99.1%)
	No	12 (10.3%)	01 (0.9%)
There is a feeling of heaviness in the scrotum in testicular cancer	Yes	113 (97.4%)	116 (100%)
	No	03 (2.6%)	00 (0.0%)
There is a change in the size of either of the testes in testicular cancer	Yes	113 (97.4%)	115 (99.1%)
	No	03 (2.6%)`	01 (0.9%)

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Table 3 Pre- and Post-Intervention Knowledge of Testicular Self-Examination (n=116)

Variable	Description	Pre Intervention	Post Intervention
Testicular Examination is a technique used to examine the testes by self to detect any abnormality in the testes like Testicular cancer	Yes	93 (80.2%)	116 (100%)
	No	23 (19.8%)	00 (0.0%)
Testicular self-examination is usually done by our partner for us	Yes	08 (6.9%)	00 (0.0%)
	No	108 (93.1%)	116 (100%)
Testicular self-examination is done after testicular cancer is diagnosed	Yes	11 (9.5%)	00 (0.0%)
	No	105 (90.5%)	116 (100%)
The best time to perform Testicular self-examination is when eating a hot meal	Yes	34 (29.3%)	00 (0.0%)
	No	82 (70.7%)	116 (100%)
Testicular self-examination should be performed every month	Yes	72 (62.1%)	116 (100%)
	No	44 (37.9%)	00 (0.0%)
Testicular self-examination is done to check the consistency of our chest	Yes	42 (36.2%)	00 (0.0%)
	No	74 (63.8%)	116 (100%)
Changes in size, shape, and texture of the testes over time are nothing to worry about during testicular self-examination	Yes	14 (12.1%)	00 (0.0%)
	No	102 (87.9%)	116 (100%)
It is done to check for lumps and swelling around the testes	Yes	102 (87.9%)	116 (100%)
	No	14 (12.1%)	00 (0.0%)
It is done to check for pain in the abdomen	Yes	26 (22.4%)	00 (0.0%)
	No	90 (77.6%)	116 (100%)
Wash hands before performing the procedure	Yes	103 (88.8%)	116 (100%)
	No	13 (11.2%)	00 (0.0%)
Place the testes between the thumb and the index finger	Yes	103 (88.8%)	116 (100%)
	No	13 (11.2%)	00 (0.0%)
Use both hands to palpate the testes	Yes	103 (88.8%)	116 (100%)
	No	13 (11.2%)	00 (0.0%)
Feel the size, shape consistency of the testes	Yes	91 (78.4%)	116 (100%)
	No	25 (21.6%)	00 (0.0%)
Each testis should be palpated one at a time during testicular self-examination	Yes	112 (96.6%)	116 (100%)
	No	04 (3.4%)	00 (0.0%)
One needs to feel for lump or abnormality in the testes during testicular self-examination	Yes	112 (96.6%)	116 (100%)
	No	04 (3.4%)	00 (0.0%)
There is a need to locate and palpate the spermatic cord and vas deferens and check for any swelling during testicular self-examination	Yes	111 (95.7%)	114 (98.3%)
	No	05 (4.3%)	02 (1.7%)

DISCUSSION

The socio-demographic characteristics of the participants revealed a mean age of 29.70 ± 7.336. Also, 74.1% and 77.6% of the study participants were the Yorubas and Christians respectively. This was not unexpected as the study was conducted in a Yoruba dominated community where most residents are Christians.

Findings from this study reveals that 50% of the participants actually had good knowledge of testicular cancer before the intervention, this is similar to the study findings in which almost half of the participants had good knowledge of testicular cancer before intervention.[9] A previous study on the assessment of medical students' knowledge, attitude, and the impact of educational intervention on testicular cancer awareness at Unaizah College of Medicine, Qassim University, Saudi Arabia also revealed a fair level of pre-intervention testicular cancer knowledge.[10] This is an obvious indication that men in different climes actually have a fair knowledge of testicular cancer.

Following the intervention, there was an increase in the level of knowledge of testicular cancer among these men as 98.3% eventually had good knowledge of testicular cancer. This proves that most of the men needed the teaching and explanation on testicular cancer to understand more concepts about testicular cancer.

The study further revealed that 63.8% of the men had good knowledge of TSE even before the intervention, while 36.2% had poor knowledge. This result is however different from that of a previous study's finding on Knowledge towards Testicular Self-Examination among regular undergraduate Non-Health Sciences University students at Debre Tabor, Amhara Regional State, Northwest Ethiopia, where it was reported that only 31.8% had good knowledge of testicular self-examination.[11] However, the aforementioned previous study on knowledge and awareness of testicular cancer and testicular self-examination among University students in Ankara, Turkey was quite similar to this study as it was revealed that more than half (56%) had good knowledge of testicular self-examination without any intervention, this showed that the level of knowledge of TSE actually varies in different locations. [9]

However, this level of knowledge showed a satisfactory increase after the intervention as all the participants (100%) had good knowledge of testicular self-examination. This is also an obvious indication that despite the varied pre-intervention knowledge of TSE in different geographical locations and races, an intervention is very necessary to ensure that men are equipped with adequate knowledge of how to conduct TSE to protect themselves from testicular cancer. The result of T-tests for the study hypothesis revealed a significant difference between the pre and post-intervention knowledge of both testicular cancer and testicular self-examination.

CONCLUSION

This study demonstrates that a structured nurse-led educational intervention can significantly improve knowledge of testicular cancer and TSE among male residents in a Nigerian community. The substantial improvements in knowledge scores suggest that similar interventions could be valuable tools for promoting early detection of testicular cancer. Future studies should focus on assessing long-term knowledge retention and behavioral change while including more diverse populations.

Correspondence: Segun Bolarinwa; E-mail: obolarinwa@unimed.edu.ng

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