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Effect of educational guidelines on knowledge and practice regarding testicular self-examination among male students

Salwa Hussein Mahmoud

Clinical Instructor in Technical Institute of Nursing at South Valley University, Egypt

Entesar Fatouh Abd-Elmoneim

Professor of Maternal and New born Health Nursing- Faculty of Nursing - Helwan University, Egypt

Shaimaa Hassan Mohamady

Assistant Professor of Maternal and New born Health Nursing- Faculty of Nursing - Helwan University, Egypt

Abstract---Background: Testicular self-examination (TSE) is the performance of a physical self-assessment of the testicles for changes in mass or shape in the scrotum that could be indicative of disease. Aim: To evaluate the effect of educational guidelines on knowledge and practice regarding testicular self-examination among male students. Design: A quasi-experimental research design was utilized in the present study. Sample: A convenience sample of (100) male students was included in this study. Setting: The study was conducted at the Technical Institute of Nursing at South Valley University. Tools: Three tools were utilized to collect data. First tool: a structured interviewing questionnaire used to assess demographic data. Second tool: to assess male students' knowledge sheet regarding testicular self-examination. Third tool: A simplified testicular self-examination checklist to assess male students' practice. Results: There was a highly statistically significant improvement in the total level of male students' knowledge and practice regarding testicular self-examination after the implementation of educational guidelines compared to before. Conclusion: Educational guidelines about testicular self-examination enriched male students' knowledge and practice more than before. Recommendations: A continuous male student educational session about testicular self-examination is recommended to upgrade the knowledge and skills of male students.

Keywords---educational guidelines, knowledge, practice testicular, self-examination.

Introduction

Testicular self-examination (TSE) is currently the most productive early detection behavior and technique for detecting testicular changes in the early stages of testicular cancer. According to the National Cancer Institute, the majority of testicular cancers are detected in men, often through TSE. It worked as expected, and it has been shown to reduce the number of testicular cancer deaths on a monthly basis. (Durham et al., 2020). Testicular self-examination (TSE), conducted regularly, can help detect a possible abnormality in the testicles before testicular cancer is diagnosed with further intensive medical investigation. TSE is a regular physical examination conducted by the individual in question once a month during or after a shower in front of a mirror using inspection and palpation methods. TSE is conducted with both hands; one hand stabilizes the testicle while the other examines it for lumps. Gumus and Terzi (2018).

Self-examination of the testicles on a regular basis is one method of detecting testicular cancer (TC). Many TC cases are discovered by the patient, either through routine TSE or through routine physical examinations. The self-exam of testicles has many advantages, such as being easily learned and applied, being safe and economical, not requiring specialised equipment, not being invasive, and taking less time compared to the other diagnostic methods. (Ozturk & Unalan, 2019). Testicular self-examination (TSE) has been promoted as a primary means for early detection. However, males in the high-risk age group have consistently been found to have little knowledge regarding TC or TSE. Increased knowledge in men has been associated with improved adherence to TSE. However, nurses, physicians, and other health educators have fallen short in their teaching roles because TSE instruction has only been provided on a sporadic basis (Kleier et al., 2019).

Performing regular TSE may also have other benefits. Men can become familiar with their own anatomy, gain knowledge on how to detect and monitor abnormalities other than cancer, and consider quicker contact with health care personnel to consult on the detected anomalies. However, the knowledge and awareness of TC and TSE are very poor among young men worldwide. Interestingly, the gap in knowledge is reported even among men who have completed higher levels of education, including health care or medical education. (Pietrzyk, Czezelewski, and Kuczapski, 2021)

Testicular cancer (TC) is the most common solid tumor affecting males between the ages of 15 and 34, accounting for 20% of cancer diagnoses in this age group. Although this disease is relatively rare (incidence rate of 6.3 cases per 100,000 for men under 50 years of age) (Ward & Vander, 2018), Testicular cancer is a relatively rare type of cancer, still has a very significant place in urological oncology because it serves as a model curable cancer in oncology. Thus, early diagnosis and treatment are very important in TC. It is possible to cure TC completely if cancer is diagnosed at an early stage. After an early diagnosis, there

is a 99% possibility of 5 more years of life. Avci and Altinel (2018).

Testicular cancer represents about 1.7% of all diagnosed cancers, with an age-standardized rate of 0.8 cases per 100,000 people. Like the rest of the world, the incidence has increased remarkably in recent years. Early detection of localized testicular cancer is associated with a significantly better prognosis as compared to advanced tumor stages. Salati, Aljabr, and Alharbi (2021).

Although the etiology of testicular cancer is not known exactly, can occur in both testicles. reported that the most important risk factor is past cryptorchidism. In addition to undescended testicles, Klinefelter's syndrome, infertility, a history of testicular cancer in a first-degree relative, estrogen level in intrauterine life, twinning, consanguineous marriage, father or sibling testicular cancer, testicular trauma, and inguinal hernia are among the risk factors. (Goktas et al., 2021).

Significance of the study

The incidence rate for testicular cancer ranges from as low as 0.5/100,000 in Egypt to as high as 9.2/100,000 in Denmark. (Manecksha & Fitzpatrick, 2018). In 2015, approximately 8430 people died from testicular cancer worldwide (Mahdavifar and Hafshejani, 2018). Testicular cancer awareness among male students who are at risk is low, and their knowledge regarding TSE is poor. They need to improve their knowledge about testicular cancer in male students and young adults and their skills in teaching TSE to promote TSE to their male students. Hergenroeder and Albert. Testicular cancer continues to be a low public health priority in Egypt. To reduce morbidity and mortality rates, men need health education campaigns to raise awareness about TC risk and empower them to value their testicular health through preventive, screening, and early detection measures. Moreover, it is necessary for nursing students to have the necessary knowledge and practice of TSE to be able to carry out the procedure on male students and encourage the students to examine their testes. (Metwally and Elsayed, 2019).

Aim of the Study

The aim of this study was to evaluate effect of educational guidelines on knowledge and practice regarding testicular self-examination among male students. This aim was achieved through the following objectives:-

- Assess male student's knowledge regarding testicular self-examination.
- Assess male student's practice regarding testicular self-examination.
- Implemented educational guidelines regarding knowledge and practice of testicular self-examination among male students
- Evaluate effect of educational guidelines on knowledge and practice of male students regarding testicular self-examination.

Research hypothesis

Male student's knowledge and practice regarding testicular self-examination will be improved after Implementation of educational guidelines.

Research Design

A quasi-experimental research design was used to achieve the aim of the study one group (pre - post) .

Setting: The study was conducted at technical institute of nursing in South Valley University.

Sample type: Convenience sample was used to collect the study subjects

Sample size: All male students (100) of first and second years at technical institute of nursing in south valley university in academic year 2020-2021.

Tools for data collection

Three tools were used for data collection were used in the present study:

Tools 1: A Structure interviewing questionnaire was designed by researcher and included 2 parts: -

- Part 1 -Demographic data: this tool is used to assess personal characteristic data and consists of four questions such as (age, residence, faculty and academic year, and source of information about testicular self-examination.
- Part 2: Knowledge assessment questionnaire regarding TSE:
- This part developed by the researcher after reviewing the literature, and used to assess the male student's knowledge regarding TSE consists of (12) questions such as (Definition of testis and testicular cancer, function of testis, type of cancer, sperm cell development, secretion of male hormones, signs and symptoms and risk factors of testicular cancer, diagnosis measures, treatment and prevention of testicular cancer, and testicular self-examination).

Scoring system: Knowledge obtained from male students was checked with the model key answer and scored as: the complete correct answer was scored as 2 points the incomplete correct answer was scored as 1 point and the do not know answer was scored as zero. The total scores of knowledge. Total knowledge score include 12 item with total score equal 24. These scores were summed and were converted into a percent score and classified into 2 categories:

§ Satisfactory knowledge: if the total scores equal or more than 70%.

§ Unsatisfactory knowledge: if the total scores less than 70%

Tools 11: - Simplified testicular self-examination checklist: this tool was adopted from Kaveri and Zidková (2020) and used to assess male students practice regarding testicular self-examination (pre, during and post procedure). It included: - frequency of performing TSE and how to perform TSE.

Scoring system: The students reported practice individually, one if done completely, zero if not done through using the checklist. Total checklist steps score (7) one score every step. These scores were summed and were converted into a percent score and classified into 2 categories:

Done ≥ 70 %

Not done $\leq 70\%$

Supportive materials

Educational booklet on TSE and testicular cancer. The information (text and illustrations) in the booklet on testicular cancer and TSE covers topics like the definition of testicular cancer, risk factors and symptoms, the value of early detection in testicular cancer, how TSE is carried out, and general suggestions for what to do in the event of discrepancies after the examination. (WHO., 2019)

Validity

The data collection tools were reviewed by a panel of three expert's professors in maternal and newborn health nursing at Helwan University, to ensure application, comprehensiveness, understanding and ease of implementation of tools. Minor modifications had been made such as rephrasing and rearrangements of sentences.

Reliability

To assess reliability, the study tools were tested by using calculating Cranach's Alpha which was 0.844 for knowledge and 0.910 for practice.

Ethical considerations

An official permission to conduct the proposed study was obtained from the Scientific Research Faculty of nursing Helwan University. Participation in the study is voluntary and subject was given complete full information about the study and their role before signing the written consent. The ethical considerations were include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information was not accessed by any other party without taking permission of the participants. Ethics, values, culture, and beliefs were respected.

Preparatory phase

It was included reviewing past, current, national, and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals, and magazines to develop tools for data collection.

Pilot study

The pilot study was carried on 10% (10 students) of the sample to examine the clarity of questions and time needed to complete the study tools. According to results of the pilot study, items was corrected, modified, added. Also helped in determined time needed for interview and evaluation the suitability of settings to perform interview. All modification was done, and male students participated in the pilot study not included in study sample.

Fieldwork

- This study was carried out in a technical nursing institute. The process of data collection was carried out in the period from the beginning of November 2020 to the end of January 2021.
- The researcher attended the technical nursing institute two days per week from 9:00am to 12:00 pm. to collect data.
- The current study was achieved through three phases: assessment phase, implementation phase, evaluation phase.

Assessment phase (Pretest)

- At the beginning, the researcher introduced herself and explain the purpose of study to male students to gain their confidence and trust to convince them to participate in the study, then the verbal consent was obtained from them.
- Students took tool (I) the first part to collect data about demographic data, the second part (pre-test) to assess knowledge level of the student. This tool was fulfilled in about (15-20) minutes.
- Then the researcher assessed the student's knowledge and practices regarding testicular self-examination by using tools II and III (pre-test). This tool took about 15- 20 minutes to be filled by the researcher from each student individually.

Implementation phases

- The total sample (100) will be divided into small groups (10) each group contains 10 students. All male students were given the theoretical and practical part.
- The *theoretical part*: this part was given through one session took 2 hours, one day per week .it contained (Definition of testis and testicular cancer, age of incidence, type of cancer, sperm cell development, secretion of male hormones, signs and symptoms and risk factors of testicular cancer, diagnosis measures, treatment and prevention of testicular cancer, and testicular self-examination).
- The *practical part*: his part was given through one session took 2 hours, another day per week using video presentation, silicon models to explanation of guidelines and examine efficacy of male students. The booklet was distributed to each student to explain the theoretical part and clinical parts

Evaluation phases

Pretest to assess prerequisite level and Posttest was held using the same tool of pretest at the end of 4 weeks after implementation of educational guidelines.

Results

Table 1
Distribution of the male students according to their demographic data (n=100)

Demographic characteristics	No	%
Age (Year)		
>20	89	89
< 20	11	11
Mean 17.8		
Academic years		
First years	52	52
Final years	48	48
Residence		
Rural	73	73
Urban	27	27

Table (1): Shows the distribution of the male students according to their demographic, revealing that most of the studied sample (89.0 %) aged range between 15 to 20 years old with mean score of 17.8., for academic years, more than half (52.0%) of them in the first year, about three quarters from rural residents.

Table 2
Distribution of the male students pre and post educational guidelines regarding to their knowledge about testicular self-examination (n=100)

Items	Pre- test		Post- test		Chi-square	
	No	%	No	%	X ²	p-value
Definition of testis:						
Correct complete	22	22	59	59	25.70	.001**
Correct incomplete	38	38	31	31		
Do not know	40	40	10	10		
Function of testis:						
Correct complete	19	19	55	55	28.47	.000**
Correct incomplete	37	37	32	32		
Do not know	44	44	13	13		
Sperm cell development:						
Correct complete	16	16	58	58	27.80	.000**
Correct incomplete	35	35	33	33		
Do not know	49	49	9	9		
Secretion of male hormones:						
Correct complete	21	21	54	54	9.613	.006**
Correct incomplete	36	36	39	39		
Do not know	43	43	7	7		
Occurrence of cancer in testicles:						
Correct complete	19	19	50	50	13.23	.000**

Correct incomplete	39	39	36	36		
Do not know	42	42	14	14		
Type of testicular tumors:						
Correct complete	20	20	52	52	11.958	.003**
Correct incomplete	36	36	39	39		
Do not know	44	44	9	9		
Definition of testicular cancer						
Correct complete	22	22	55	55	13.58	.000**
Correct incomplete	32	32	36	36		
Do not know	46	46	9	9		
Risk factors of testicular cancer						
Correct complete	17	17	58	58	10.958	.009**
Correct incomplete	35	35	36	36		
Do not know	48	48	6	6		
Signs and symptoms of testicular cancer						
Correct complete	20	20	56	56	17.901	.000**
Correct incomplete	34	34	38	38		
Do not know	46	46	6	6		
Diagnosis for testicular cancer						
Correct complete	14	14	52	52	10.942	.008**
Correct incomplete	39	39	34	34		
Do not know	47	47	14	14		
Treatment for testicular Cancer						
Correct complete	15	15	54	54	9.420	.009**
Correct incomplete	40	40	33	33		
Do not know	45	45	13	13		
Prevention of testicular cancer						
Correct complete	18	18	59	59	25.47	.000**
Correct incomplete	33	33	36	36		
Do not know	49	49	5	5		

*Statistically significant difference ($p \leq 0.05$)
 difference ($p \leq 0.001$)

** Highly statistically significant

Table (2): presents that comparison between the male students at pre and post educational guidelines regarding to their knowledge about testicular self-examination, it was observed that two fifths (40.0%) of the male students had incorrect knowledge about definition of testis pre-educational guidelines, while post intervention about three fifths (59.0%) of male students had correct knowledge at p -value (.001**). Concerning occurrence of cancer in testicles, (19.0% & 50.0%) of them had correct knowledge at pre and post educational guidelines respectively. less than half (47.0%) of male students had incorrect knowledge about diagnosis for testicular cancer pre-educational guidelines, while post educational guidelines more than half (52.0%) of male students had correct knowledge at p value (.008**). Concerning treatment for testicular cancer, (15.0% & 54.0%) of male students had correct knowledge at pre and post educational guidelines, respectively. Moreover, there was a high statistically significant difference in the level of knowledge among male students pre -post educational guidelines about testicular self-examination. Lastly, there was a statistically significant difference in the level of knowledge among male students

pre –post educational guidelines

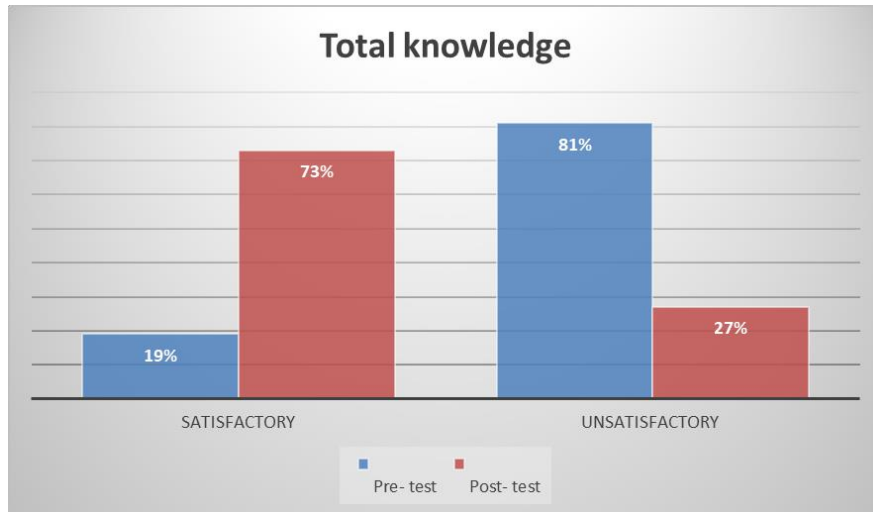


Figure 1. Distribution of the male students according to their total knowledge regarding testicular self-examination (n=100)

Figure (1): Reveals distribution of the male students according to their total knowledge regarding testicular self-examination it was observed that more than four fifths (81.0%) of the male students had unsatisfactory knowledge level at pre-educational guidelines, while post educational guidelines, less than three quarters (73.0%) of male students had satisfactory knowledge level.

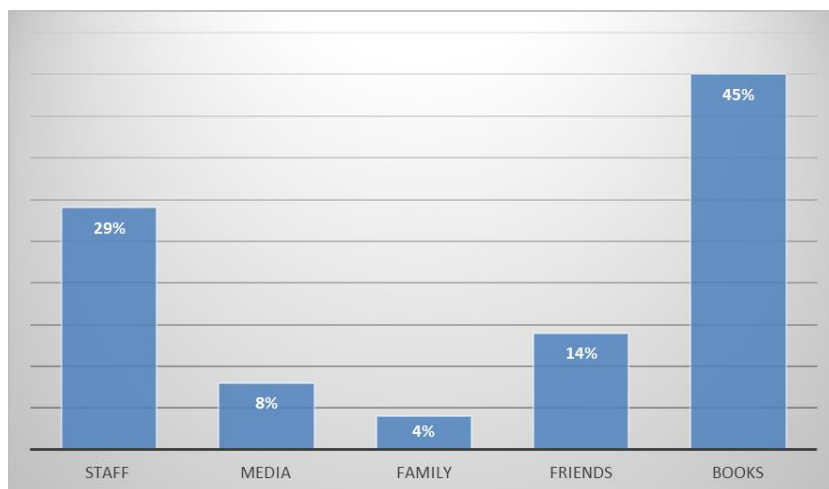


Figure 2. Distribution of the male students sample according to their source of information regarding testicular self-examination (n=100)

Figure (2): Displays distribution of the male students according to their source of information regarding testicular self-examination, it was noticed that (45%) the books most frequent source of information, then source (29%) was staff, on other hand, only (4%) of the male students reported that family source of information

regarding testicular self-examination.

Table 3
Distribution of the male students according to their practice towards testicular self-examination (n=100)

Items	Pre- test				Post- test				Chi-square p-value
	Done		Not done		Done		Not done		
	No	%	No	%	No	%	No	%	
Frequency of performing testicular self-examination									
• Once	10	10	90	90	69	69	31	31	18.900
• Two times	8	8	92	92	60	60	40	40	<0.01**
• Tree times or more	2	2	98	98	56	56	44	44	
Stand in front of a mirror naked to examine for any abnormal swelling of the scrotum	13	13	87	87	71	71	29	29	17.645
									<0.01**
Hold penis out of the way and can see the entire scrotum.	10	10	90	90	68	68	32	32	20.132
									<0.01**
Examine each testicle with both hands	15	15	85	85	66	66	34	34	16.211
									<0.01**
Place the index and middle fingers under the testicle with the thumbs on top	12	12	88	88	69	69	31	31	19.677
									<0.01**
Roll the testicle gently between the thumbs and fingers	11	11	89	89	71	71	29	29	18.433
									<0.01**
Feel and look for any lumps or any changes in size, shape or feeling of the testicle	13	13	87	87	74	74	26		17.550
									<0.01**

*Statistically significant difference ($p \leq 0.05$) ** Highly statistically significant difference ($p \leq 0.001$)

Table (3): Reveals Comparison between the male students pre and post educational guidelines regarding to their practice towards testicular self-examination, it was noticed that most of the male students did not do performing testicular self-examination pre educational guidelines , while post educational guidelines highest percentage of them performing testicular self-examination at p value ($<0.01^{**}$). (10% & 68.0%) of the male student do hold penis out of the way to see the entire scrotum pre and post educational guidelines respectively at p value ($<0.01^{**}$). Furthermore, there was a high statistically significant difference in the practice scores among male students towards testicular self-examination pre – post educational guidelines.

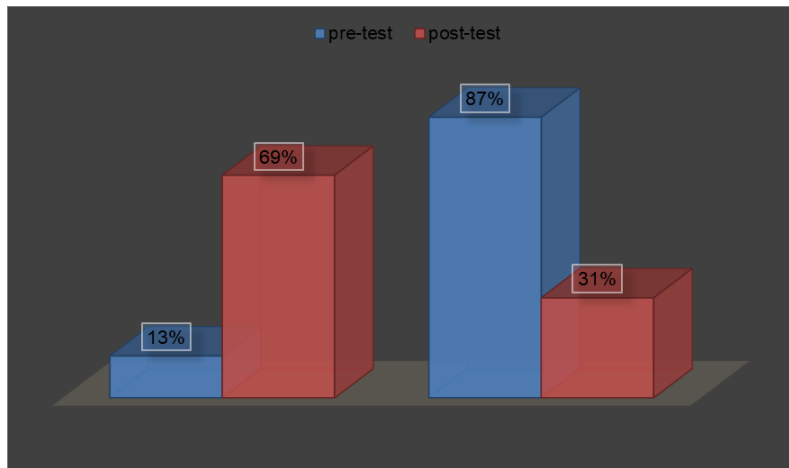


Figure 3. Distribution of the male students according to their total practice towards testicular self-examination (n=100)

Figure (3): Shows distribution of the male students according to their total practice towards testicular self-examination, it was noticed that the majority (87.0%) the male students had inadequate practice level at pre-educational guidelines, while more than three thirds (69.0%) of male students had adequate practice level at post educational guidelines packaged.

Table 4

Relation between demographic data of the male students and their total knowledge about testicular self-examination at pre-educational guidelines (n=100)

Items		Total knowledge				X ²	P- Value
		Satisfactory (n=19)		Unsatisfactory (n=81)			
		No	%	No	%		
Age (year)	15-20	10	52.6	79	97.5	7.107	.015*
	<20	9	47.4	2	2.5		
Academic years	First years	3	15.8	49	60.5	10.25	0.040*
	Final years	16	84.2	32	39.5		
Residence	Rural	9	47.4	64	79.1	6.283	.179
	Urban	10	52.6	17	20.9		
Socioeconomic levels	Low	1	5.3	20	24.7	13.08	.000**
	Middle	1	5.3	54	66.7		
	High	17	89.4	7	8.6		
Source of information	Staff	5	26.3	24	29.6	12.50	.002**
	Media	0	0	8	9.9		
	Family	0	0	4	4.9		
	Friends	1	5.3	13	16.1		
	Books	13	68.4	32	39.5		

* Statistically significant difference at $p \leq (0.05)$. **Highly statistically significant difference at $p \leq (0.01)$.

Table (4): Shows relation between Demographic data of the male students and their total knowledge about testicular self-examination at pre of an educational guidelines, presented that there was a highly statistical significant difference between male students' knowledge level and their socioeconomic levels & source of information at p value (.000**& .002**) respectively, moreover there was a statistical significant difference between male students' knowledge level and their age academic years at p value (.015*&0.040*) respectively. On the other hand, there was no statistically significant difference between male students' knowledge level and their residence at p value (.179).

Table 5
Relation between demographic data of the male students and their total knowledge about testicular self-examination at post of an educational guidelines (n=100)

Items		Total knowledge				X2	P-Value
		Satisfactory (n=73)		Unsatisfactory (n=27)			
		No	%	No	%		
Age (year)	15-20	63	86.3	26	96.3	7.012	0.017*
	<20	10	13.7	1	3.7		
Academic years	First years	27	36.9	25	92.6	13.12	.001**
	Final years	46	63.1	2	7.4		
Residence	Rural	51	69.9	22	81.5	.505	.950
	Urban	22	30.1	5	18.5		
Socioeconomic levels	Low	6	8.3	15	55.6	10.25	0.040*
	Middle	45	61.6	10	37.0		
	High	22	30.1	2	7.4		
Source of information	Staff	27	36.9	2	7.4	12.90	.001**
	Media	0	0	8	29.7		
	Family	0	0	4	14.8		
	Friends	2	2.7	12	44.4		
	Books	44	60.4	1	3.7		

* Statistically significant difference at $p \leq (0.05)$. **Highly statistically significant difference at $p \leq (0.01)$.

Table (5): Displays Relation between demographic data of the male students and their total knowledge about testicular self-examination at post of an educational guidelines, it was noticed that there was a highly statistical significant difference between male students' knowledge level and their Academic years & source of information at p value (.001**), moreover there was a statistical significant difference between male students' knowledge level and their age & Socioeconomic levels at p value (0.017**&0.040*) respectively. On the other hand, there was no statistically significant difference between male students' knowledge level and their residence at p value (.950).

Table 6

Relation between demographic data of the male students and their total practice towards testicular self-examination at pre of an educational guideline (n=100)

Items		Total practice				X2	P-Value
		Adequate (n=13)		Inadequate (n=87)			
		No	%	No	%		
Age (year)	15-20	2	15.4	87	100	12.50	.002**
	<20	11	84.6	0	0		
Academic years	First years	8	61.5	44	50.6	4.003	.406
	Final years	5	38.5	43	49.4		
Residence	Rural	9	69.2	64	73.6	.505	.950
	Urban	4	30.8	23	26.4		
Socioeconomic levels	Low	2	15.4	19	21.8	2.931	.239
	Middle	8	61.5	47	54.1		
	High	3	23.1	21	24.1		
Source of information	Staff	8	61.5	21	24.1	12.90	.001**
	Media	0	0	8	9.3		
	Family	0	0	4	4.6		
	Friends	0	0	14	16.1		
	Books	5	38.5	40	45.9		

* Statistically significant difference at $p \leq (0.05)$. **Highly statistically significant difference at $p \leq (0.01)$.

Table (6): Reveals relation between demographic data of the male students and their total practice towards testicular self-examination at pre of an educational guidelines, presented that there was a highly statistical significant difference between male students' total practice and their age & source of information at p value (.002** & .001**) respectively, on the other hand, there was no statistically significant difference between male students' total practice towards testicular self-examination and their academic years, residence & socioeconomic levels at p value (.406, .950 & .239) respectively

Table 7

Relation between demographic data of the male students and their total practice towards testicular self-examination at post of an educational guidelines (n=100)

Items		Total practice				X2	P-Value
		Done (n=69)		Not done (n=31)			
		No	%	No	%		
Age (year)	15-20	60	86.9	29	93.5	7.756	.021*
	<20	9	13.1	2	6.5		
Academic years	First years	25	36.2	27	87.1	5.675	.017*
	Final years	44	63.8	4	12.9		

Residence	Rural	45	65.2	28	90.3	2.287	0.124
	Urban	24	34.8	3	9.7		
Socioeconomic levels	Low	13	18.8	8	25.8	2.936	.230
	Middle	42	60.9	13	41.9		
	High	14	20.3	10	32.3		
Source of information	Staff	25	36.2	4	12.9	24.545	.000**
	Media	1	1.4	7	22.6		
	Family	0	0	4	12.9		
	Friends	2	2.9	12	38.7		
	Books	41	59.5	4	12.9		

* Statistically significant difference at $p \leq (0.05)$. **Highly statistically significant difference at $p \leq (0.01)$.

Table (7): illustrates Relation between Demographic data of the male students sample and their total practice towards testicular self-examination at post of an instructional guidelines, presented that there was a highly statistical significant difference between male students' total practice and their source of information at p value (.000**), moreover there was a statistical significant difference between studied students' total practice and their age Academic years at p value (.021*&0.017**)respectively. On the other hand, there was no statistically significant difference between male students' total practice towards testicular self-examination and their residence & socioeconomic levels at p value (0.124&.230) respectively.

Table 8

Correlation between total knowledge of the male students' and their total practice at pre of an educational guideline (n=100)

Item	Total knowledge	
	R	P- value
Total practice	0.490	.000**

**Highly statistically significant difference at $p \leq (0.01)$.

Table (8): presents Correlation between total knowledge of the male students and their total practice at pre of an educational guidelines, indicated that the there was a highly positive association between total knowledge of male students and total practice at pre of an educational guidelines with r 0.490 at p value (.000**)

Table 9

Correlation between total knowledge of the male students and their total practice at post of an educational guidelines (n=100)

Item	Total knowledge	
	R	P- value
Total practice	25.70	.001**

**Highly statistically significant difference at $p \leq (0.01)$.

Table (9): Reveals Correlation between total knowledge of the male students and their total practice at post of an educational guidelines, was observed that there was a highly statistically significant difference association between total knowledge of male students and total practice post of an educational guidelines with $r = 0.75$ at p value (.001)

Discussion

Lack of knowledge related to the risks created by TC and to testicular self-examination (TSE), which is very important for early diagnosis in young men, is revealed to be among the reasons for delay in diagnosis and treatment. Performing TSE regularly once a month is very important for individuals' familiarity with their testicular tissue and for any difference to be diagnosed early (Karazeybek et al., 2021). This study aimed to evaluate the effect of educational guidelines on knowledge and practice of male students regarding testicular self-examination. The results of the present study, revealed that the majority of the male students sample aged range between 15 to 20 years old with mean score 17.8., for academic years, more than half of male students at first years, about three quarters from rural. For socioeconomic levels, more than half of the male students had middle socioeconomic level, moreover less than half of male students reported source of information regarding testicular self-examination was books.

Regarding to academic years, the present study showed that more than half of the male students on first year nursing education, this result in same line with Ustundag, (2019) who conducted study about "Assessment of the Testicular Self-Examination Knowledge and Health Belief Model of Health Sciences Students" and revealed that the highest percentage of the study sample were in first education. Concerning on age, the current finding revealed that the majority of the male students aged range between 15 to 20 years old with Mean \pm Sd 17.8 , from researcher point view, this age group at adolescence was identified to be the beginning of the possibility of testicular cancer, so raising awareness about regular self-screening in such age is of most importance as a preventive measure.

On other hand, this finding disagreement with study by Dhakal et al., (2021) who conducted study about "Knowledge, Attitude, and Practice regarding Testicular Cancer and Testicular Self-Examination among Male Students Pursuing Bachelor's Degree in Bharatpur Metropolitan City, Chitwan, Nepal "and presented that of the male students their age ranged between 16-20 years . This difference between the two studies might be due to the duration of technical institute of nursing being two years. Regarding to residence, the present study showed that the highest percentage of the male students living at rural areas, this finding matched with study by Gutema et al., (2018) under title "Testicular self-examination among Bahir Dar University students: application of integrated behavioral model" and proved that the highest percentage of studied sample from rural areas.

The current study displayed that less than half of male students reported source of information regarding testicular self-examination was books. This result incongruent with Karazeybek et al., (2021) who conducted study about "Beliefs

and behaviors of students in health-related faculties regarding testicular self-examination" and showed three quarters of the male student their information related to testis cancer from their lesson. Also, these results different from study by Pour et al., (2018) under title "The effect of testicular self-examination education on knowledge, performance, and health beliefs of Turkish men" and showed that of the male students' sample got information related to testicular cancer and TSE via books.

Regarding to knowledge about testicular self-examination, the current study presented that most of the male students had incorrect knowledge about testicular self-examination, while after applying educational guidelines their improvement knowledge about testicular self-examination. Additionally, there was a high statistically significant difference in the level of knowledge among male students pre –post instructional guidelines about testicular self-examination, this outcome matched with Seher et al., (2020) who conducted study about "Knowledge, beliefs and practices of university students regarding testicular cancer and testicular self-examination" and showed the majority of the male students were not knowledgeable about testicular cancer and did not know how to do TSE.

Moreover, this result supported with Mezayen&Abd El-Hay, (2019) who conducted study about "Effect of educational guidelines based on health belief model regarding testicular cancer knowledge, practice and beliefs among male students" and showed that there was a high statistically significant difference in the level of knowledge among male students pre –post health belief model about testicular self-examination. From a researcher's point view, this result might be due to effectiveness of educational guideline on knowledge.

Concerning on Frequency of performing testicular self-examination, the present study indicated that only of the male students performed testicular self-examination once per month before educational guidelines and there significant difference between frequency of performing testicular self-examination after implementation of educational guideline, this finding consistent with result by Zeleke et al., (2019) who conducted study about "Knowledge, attitude and practice towards testicular self-examination among regular undergraduate non-health sciences university students, Debre Tabor, Amhara Regional State" and reported only of the male students performed testicular self-examination once per month. Moreover, this result supported with result by Faydali, (2018) who conducted study about "The status of testicular self-examination of male students taking health education and the factors affecting Turkish" and proved that was found that levels of performing TSE in male students receiving nursing training higher than those receiving education in other levels not receiving nursing training with significant difference between pre and post intervention.

On other hand, this finding disagreement with Kuzgunbay et al., (2018) under title " Public awareness of testicular cancer and self-examination in Turkey: a multicenter study of Turkish Urooncology Society" and reported that only of male students perform TSE once per month. Concerning on total knowledge scores, the present study Indicated that more than four fifths of the male students had unsatisfactory knowledge level at pre intervention, while post intervention, more

than one quarter of male students had unsatisfactory knowledge level. Finally, there was a high statistically significant difference in the total knowledge scores among male students regarding testicular self-examination pre –post intervention at p value (.000**).

From researcher point view, this result might be due to most of the male students were first year students, whose curriculum had not yet included testicular cancer education. This result harmony with Demir & Polat, (2020) who conducted study about "The effect of testicular cancer and testicular self-examination on knowledge, attitude and health beliefs in university students in Turkey" and presented that the majority of the male students had poor knowledge about testicular cancer. Additionally, this finding agreement with result by Jeihooni et al., (2021) who conducted study about "The effect of educational intervention based on health belief model and social support on testicular self-examination in male students of Iranian men" and stated that significant enhancement of average score of knowledge about testicle and testicular self-examination in experimental groups after the intervention. From researcher point view, this result might be due to effectiveness of educational guideline on improvement of knowledge.

The present study displayed that only of the male students sample do Stand in front of a mirror naked to examine for any abnormal swelling of the scrotum before applying educational guidelines, while after applying the guideline become less than three quarters of them performed, this result agreement with study by Alemu and Baih, (2019) who done " Awareness and practice of testicular self-examination among regular undergraduate male health sciences university students, Debre Tabor, Northwest Ethiopia" and showed that only less than of half of the male students sample perform testicular self-examination In front of the mirror.

Regarding practice of Examine each testicle with both hands, the present study was observed that there was a high statistically significant increase in their level of practice scores of the subject-sample after the applying educational guidelines. This outcome is consistent with result Akca et al., (2021) who conducted a study about "Evaluation of Training Program for Nursing Students on Testicular Cancer and Testicular Self-Examination. Iranian" and proved that there was a high statistically significant increase in their level of practice score of the subject-matter after the training.

Regarding to total practice scores towards testicular self-examination, the majority the male student had inadequate practice level at pre intervention, while less than one third of male students had inadequate practice level at post intervention packaged, this outcome in same line with study by Etita et al., (2017) under title "Knowledge, attitude and practice of testicular self-examination among male undergraduate students in a tertiary institution in Calabar, Cross River State Nigeria" and revealed that the majority of male students had inadequate practice level. This result might due to seem belief that they are not at risk of developing any ill health and that serious illnesses like TC were more associated with advancement in age. from researcher point view, this result might be due to effectiveness of educational media on practice.

The current study noticed that there was a highly statistically significant difference between male students' knowledge level and their Academic years & source of information at p value, moreover there was a statistically significant difference between male students' knowledge level and their age & Socioeconomic levels at p value respectively. On the other hand, there was no statistically significant difference between male students' knowledge level and their residence at p value. This outcome is in the same line with Alemu & Baih, (2019) who did in Ethiopia and showed that as students' year of study increased, their knowledge and practice of TSE were also increased, and there was a highly statistically significant difference between total knowledge score and Academic years. Moreover, this result is supported with a study done in Iran by Akca et al., (2021) who displayed that there was a highly statistically significant difference between total knowledge score and age.

On the other hand, this finding is discordant with the findings of Alaradi, & Almuqamam, (2020) who conducted a study about "Awareness of Testicular Cancer and Testicular Self-Examination among Men in Bahrain" and presented that there is no significant relationship between knowledge of TC, TSE, and age. The current study illustrated that there was a highly statistically significant difference between male students' total practice and their source of information at p value, moreover there was a statistically significant difference between male students' total practice and their age & Academic years at p value respectively, this outcome is in disagreement with Marmarà et al., (2020) who conducted a study about "Testicular Cancer Awareness among Men Residing in the Maltese Islands" and revealed that the association between practice of TSE and prior history of TC in the family was significant and no significant associations between practice of TSE and age and level of education.

Concerning the correlation between total knowledge of the male students and their total practice at pre of an instructional supportive guideline, it indicated that there was a highly positive association between total knowledge of male students and total practice at pre of an instructional supportive guideline. This finding is compatible with the prior study conducted by Ahmed et al., (2019) who performed a study about "Testicular Cancer Preventive Behavior among Nursing Males' Students: Intervention Guidelines" and showed that there was a highly positive association between total knowledge of male students and total practice pre and post Intervention Guidelines. On the other hand, this result is in disagreement with a study by Mizie-Okoye et al., (2016) who conducted a study about "Testicular Cancer Awareness and Testicular self-examination among senior secondary school students in Urban Local Government Area of Rivers State" and stated that there was a negative association between total knowledge of male students and total practice. This result might be due to students not having the confidence and competency to carry out TSE.

Conclusion

Based on the findings of the present study, it can be concluded that male students who received educational guidelines about testicular self-examination showed a statistically significant improvement in their total level of knowledge and practice than before, and this is supported by the research hypothesis.

Recommendations

- Continuous male student's educational session about testicular self-examination is recommended to upgrade the knowledge and skills of male students.
- Replication of the current study on a larger probability sample and other health care settings.

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