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Level of Knowledge, Attitude and Practice of Testicular Cancer and Testicular Self-Examination among Male Students in A Centre for Foundation Studies in Pahang State of Malaysia Students

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ABSTRACT

Background: The occurrence of testicular cancer among the young adult population has gradually increased throughout the decades. Although the incidence is increasing, the susceptible population shows lack of awareness that early detection of testicular cancer can reduce mortality risk. Testicular self-examination is a simple, convenient, and safe procedure that is essential for early detection of testicular cancer. Globally, the practice of testicular self-examination among young adults is unsatisfying. Thus, this study aimed to assess the level of knowledge, attitude and practice regarding testicular cancer and testicular self-examination among male students in a foundation centre, and to identify their associations with sociodemographic characteristics.
Methods: A cross-sectional study was conducted among 386 eligible respondents who were recruited using stratified random sampling. A self-administered questionnaire was used to collect the knowledge, attitude and practice data on testicular cancer and testicular self-examination. The descriptive data were presented in frequency and percentage. The associations between the variables were analyzed using the Chi-square test.
Results: Majority of respondents have poor knowledge (59.6%), favorable attitude (52.8%) and not practicing testicular self-examination (80.3%). The Chi-Square analysis showed a significant association between attitude with Kulliyyah and sources of information, as well as practice with Kulliyyah (p<0.05).
Conclusion: The study found an unsatisfactory level of knowledge and practice on testicular cancer and testicular self-examination, although most of them have favorable attitude towards testicular cancer and testicular self-examination. Significant associations were found between the sociodemographic and attitude, as well as practice.

Keywords: Testicular cancer; Self-examination; Knowledge; Practice; Attitude

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INTRODUCTION

Testicles are vital organs that essential for male sexual development (1). However, in unfavorable circumstances, a healthy testicular cell may become cancerous if it undergoes mutation and grows uncontrollably. Despite its rarity, the incidence of testicular cancer (TCa) in Malaysia showed an escalating trend where the incidence of TCa was increasing from 496 cases in period between 2007 and 2011 to 636 cases in period between 2012 to 2016 (2). Furthermore, the report also revealed that the incidence of late stage TCa cases increased between these periods while early-stage case was decreased. The rising incidence of TCa among young males aged 15 to 24 is alarming. Even though the situation is not as crucial as other cancers, an early intervention would be helpful in curbing the prevalence from being worsen.

TCa can be detected early by practicing a regular examination on the testicles, known as testicular self-examination (TSE). It is a simple, convenient, and safe procedure that has been suggested to be practiced monthly by males who already at puberty age, especially those between 15 to 35 years old, to detect any abnormalities on testicles, including TCa (3-5). Even though it can be practiced easily by males, previous studies showed that the level of practice of TSE among young males in some countries globally, particularly university students, was very poor, where only less than 40% of their study population practicing TSE. Consistent with poor level of practice of TSE, these studies also reported the poor level of knowledge and attitude on TCa and TSE among this population (1,5-7).

Furthermore, the previous studies showed that there was a significant association between demographic characteristics, such as marital status, age and source of information, and level of knowledge, attitude and practice (KAP) (1,4,5). This finding showed the influence of demographic characteristics on the level of KAP that may cause the high incidence of TCa among young males. Importantly, they also found a significant correlation between knowledge, attitude and practice, indicating interplay between these variables and the importance of empowering knowledge on TCa and TSE to improve the level of attitude and practice of TSE (1,4,5). However, the study on KAP of TCa and TSE among young males in Malaysia is poorly reported and outdated. Since the global trend of KAP of TCa and TSE are akin, it is assumed that the similar trend may occur among young male Malaysians, though evidence is required to confirm this assumption. Thus, the current study aimed to measure the level of KAP on TCa and TSE among a young male population in a Centre for Foundation Studies (CFS) in Pahang state of Malaysia to gain preliminary observation on the issue prior to embarkment into a larger study. It is important to put concerned on the level of KAP on TC and TSE among Malaysian males at these ages to understand the situation and strategize appropriate public health intervention as an effort to improve the TSE practice in this population.

METHODS

This study is a cross-sectional study that conducted among male students in CFS of International Islamic University Malaysia (IIUM). The sample size was calculated using sample size calculator by Raosoft® with the setting of 5% margin of error, 95% confidence level and 50% of response distribution for a population of 1571, which resulted in minimum sample size of 309. The participants were recruited using stratified random sampling method from April until June 2023. The recruitment was performed by obtaining a list of students' names from a batch representative of each year of study. The list was stratified based on Kulliyyah (study programme). Then, the students were selected using an online random sampler (https://www.randomizer.org/). The participants who were Malaysian, active status of enrolment during the study period and have no history TCa, were invited to join the study.

A set of questionnaires that was adopted from Dhakal et al. (1) has been used in this study. The questionnaire consisted of four parts, which were Part A, Part B, Part C and Part D. Part A was sociodemographic data that consisted of the name of Kulliyyah and sources of information. Part B consisted of eleven multiple-choice questions regarding the knowledge of TCa and TSE with one correct answer. The eleven questions were about definition, risk factors, symptoms, treatment, and complication of TCa and methods of TSE. Good and poor knowledge was determined based on the mean score (1). Part C consisted of eight questions on attitudes toward TCa and TSE that were assessed by a 5-point Likert scale,

which consisted of strongly disagree, disagree, neutral, agree and strongly agree. The questions' total score was 40, where the score of more than 24 was considered favorable attitude, and the score of 24 and below was unfavorable attitude. The scores for positive statements were strongly agree=5, agree=4, neutral=3, disagree=2, and strongly disagree=1. Reverse scoring was done for negative statements (1). Finally, Part D consisted of three questions that measured the level of practice of TSE among the participants.

Descriptive statistics was used to analyze the socio-demographic characteristics, knowledge, attitude and practices of the respondents. Inferential statistics, namely Chi-square test, was used to assess the association between socio-demographic characteristics and the levels of KAP regarding TCa and TSE. *P*-value of less than 0.05 was considered as significant. All statistical analyses were performed using Statistical Package for Social Sciences version 28 (IBM, New York, United States).

Ethical Matters

The protocol of study was reviewed and approved by IIUM Research Ethic Committee (IREC 2023-KON/NURF12). Informed consent was obtained from the respondents prior to embarkment into the study. Their information was kept confidential, and their identities were kept anonymously.

RESULTS

Sociodemographic Data

The distribution of respondents based on Kulliyyah and source of information of TCa and TSE is illustrated in **Table 1**.

Knowledge of TCa and TSE among Male Students in CFS IIUM

As illustrates in **Table 2**, most respondents did not answer the most questions correctly, except for items on some risk factors of TCa, which were positive family history and multiple sex partner. This was indicated by less than half of the respondents answering these questions correctly.

Attitude towards TCa and TSE among Male Students in CFS IIUM

Table 3 illustrates that many respondents displayed unfavorable attitude towards most statements related to TCa and TSE, except for item 5, 7 and 8, which indicated by less than half of the respondents answered these questions towards favorable attitude.

Practice of TSE among Male Students in CFS IIUM

Table 4 shows that the percentage of practice of TSE among the respondents was poor, which indicated by 89.1% of the respondents did not practicing TSE. The main reason for not practicing TSE was due to not having knowledge about TSE. However, among those who practiced TSE, only 6.1% of them practiced it correctly, which should be done once a month.

Level of KAP on TCa and TSE among Male Students in CFS IIUM

The analysis of scores for knowledge on TCa and TSE in **Table 5** shows that most of respondents had poor level, indicated by 59.6% of the respondents obtaining less than mean score. In contrast, more than 50% of the respondents showed favorable attitude towards TCa and TSE with total score of more than the mean score. Meanwhile, the respondents have poor level of practice of TSE, which indicated that by only 19.7% of the are performing TSE.

Association between KAP on TC and TSE with Sociodemographic Characteristics of Male Students in CFS IIUM

Based on **Table 6**, level of attitude was significantly associated with Kulliyyah and sources of information ($p<0.05$), and level practice was significantly associated with Kulliyyah ($p<0.05$). However, there was no significant association between level of knowledge and all socio-demographic characteristics.

DISCUSSION

Knowledge of TCa and TSE among Male Students in CFS IIUM

Raising awareness and knowledge of TCa among males is crucial to improve the chances of its early detection (1). However, the current study showed that most young males in the CFS of IIUM have poor knowledge of TCa and TSE, which may increase the risk of detecting TCa at

late stage. This finding was in line with other studies which reported that more than half of male students in the universities had insufficient knowledge regarding TCa (1,5-7).

These studies highlighted that most male university students did not know that they were in the age of risk in getting TCa and symptoms of TCa. The current study also found similar trend of knowledge, where only 46.1% and 21.2% of the respondents answer correctly on the age at risk and symptoms of TCa, respectively. Furthermore, more than half of the respondents did not know age and undescended testis were risk factors of TCa, which consistent with the findings in the previous studies (1,5,6). These findings indicate that the young male population in the study were not aware that they were susceptible to TCa, where this cancer is among prevalent types of cancers within their age.

Thus, a proactive measure, such as organizing awareness campaign of TCa to adolescents and young adults in April within campus that commonly conducted in other countries, should be considered to enlighten the population at risk with knowledge of TCa and TSE. Additionally, implementation of educational campaigns, awareness programmes, and TSE training among high-risk groups should be enforced to improve the situation (1).

Table 1: Sociodemographic Characteristics of Respondents (N=386)

Characteristics	Category	Frequency (n)	Percentage (%)
Kulliyyah	AIKOL	20	5.2
	KAED	21	5.4
	KENMS	31	8.0
	KIRKHS	59	15.2
	KLM	9	2.3
	KOE	134	34.6
	KOS	18	4.7
	KOED	8	2.1
	KOM	23	5.9
	KON	18	4.7
	KOD	7	1.8
	KAHS	21	5.4
	KOP	17	4.4
Sources of information	Health workers	21	5.4
	Health/sex education	56	14.5
	Parents and teachers	179	46.4
	Mass media	130	33.7

AIKOL: Ahmad Ibrahim Kulliyyah of Laws, KAED: Kulliyyah of Architecture and Environmental Design, KENMS: Kulliyyah of Economics and Management Sciences, KOED: Kulliyyah of Education, KOE: Kulliyyah of Engineering, KIRKHS: Kulliyyah of Islamic Revealed Knowledge and Human Sciences, KLM: Kulliyyah of Languages and Management, KOM: Kulliyyah of Medicine, KOD: Kulliyyah of Dentistry, KOP: Kulliyyah of Pharmacy, KON: Kulliyyah of Nursing, KAHS: Kulliyyah of Allied Health Sciences, KOS: Kulliyyah of Science

Table 2: Respondents' Knowledge Regarding TCa and TSE (N=386)

Characteristics	Responses	Frequency (n)	Percentage (%)	Mean±SD
Meaning of testicular cancer				2.17±1.11
	Painful lump in testicle	140	36.3	
	Swelling and redness of testicle	111	28.8	
	Increase in size of testicle	64	16.6	
	*Painless lump in testicle	71	18.4	
Age groups at risk of testicular cancer				3.0±1.11
	Not sure	63	16.3	
	Below 15 years	47	12.2	
	Above 35 years	98	25.4	
	*15-35 years	178	46.1	
Risk factors of testicular cancer				1.77±0.42
	Positive family history			
	No	87	22.5	
	*Yes	299	77.5	
	Multiple sex partner			1.76±0.43
	Yes	93	24.1	
	*No	293	75.9	
	Age			1.42±0.50
	No	222	57.5	
	*Yes	164	42.5	
	Undescended testis			1.32±0.47
	No	262	67.9	
	*Yes	124	32.1	
Signs and symptoms of testicular cancer				2.62±0.95
	Weight loss	46	11.9	
	Sudden fluid buildup in scrotum	136	35.2	
	Swelling and redness of testicles	122	31.6	
	*Painless lump in testicle	82	21.2	
Best way to treat testicular cancer				3.82±1.36
	Not sure	36	9.3	
	removal of penis	50	13.0	
	Radiotherapy	32	8.3	
	chemotherapy	99	25.6	
	*Early detection	169	43.8	
Best way to prevent testicular cancer				3.16±0.91
	Wait and watch	26	6.7	
	Regular follow up for any testicular abnormality	57	14.8	
	Early detection	134	34.7	
	*Regular testicular self-examination	169	43.8	
Frequency to perform testicular self-examination				2.82±1.40
	When discomfort	23	6.0	
	Not sure	47	12.2	
	Once every year	72	18.7	
	Once every 6 months	142	36.8	
	Once every 3 months	37	9.6	
	*Once every month	65	16.8	

*Correct options

Table 3: Respondents' Attitude Towards TC and TSE (N=386)

Statements	Frequency, n (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
*Testicular cancer has no cure	50 (13.0)	85 (22.0)	65 (16.0)	154 (39.9)	32 (8.3)
*Men having testicular cancer are completely infertile	67 (17.4)	178 (46.1)	69 (17.9)	67 (17.4)	5 (1.3)
Testicular cancer is a common cancer. Many men go through it	32 (8.3)	112 (29.0)	161 (41.7)	52 (13.5)	29 (7.5)
Testicular cancer often strikes men my age	25 (6.5)	60 (15.5)	78 (20.2)	190 (49.2)	33 (8.5)
TSE helps in the early detection	130 (33.7)	182 (47.2)	24 (6.2)	21 (5.4)	29 (7.5)
TSE should be done once a month regularly	30 (7.8)	155 (40.2)	148 (38.3)	34 (8.8)	19 (4.9)
TSE should be done in the shower or shortly after the shower	18 (4.7)	216 (56.0)	71 (18.4)	62 (16.1)	19 (4.9)
*TSE is a form of masturbation.	40 (10.4)	92 (23.8)	47 (12.2)	167 (43.3)	40 (10.4)

*Negative statements

Table 4: Respondents' Practice of TSE (N=386)

Items	Frequency (n)	Percentage (%)
Testicular examination		
Performed	76	19.7
Not performed	310	80.3
Frequency if perform		
When felt discomfort	26	34.2
Once in six months	13	17.1
Once in three months	18	23.7
Once a month	19	25.0
Reason for not performing		
Not having knowledge	198	51.3
Not seen as important	75	19.4
Not complaining	8	2.1
Feeling sinful	29	7.5
Fear of result	76	19.7

Table 5: Level of KAP on TCa and TSE Among Respondents (N=386)

Variables	Frequency, n (%)	Mean score (SD)	Minimum score	Maximum score
Level of knowledge		4.18 (1.60)	0.00	8.00
Good	156 (40.4)			
Poor	230 (59.6)			
Level of attitude		25.17 (4.87)	8.00	37.00
Favorable	204 (52.8)			
Unfavorable	182 (47.2)			
Level of Practice				
Performed	76 (19.7)			
Not performed	310 (80.3)			

Poor knowledge = mean score <4.18, good knowledge = mean score ≥4.18, unfavorable attitude = mean score < 25.17, favorable attitude = mean score ≥25.17

Table 6: Association Between Sociodemographic Characteristics with Level of KAP on TCa and TSE (N=386)

	Level of knowledge			**Level of attitude**			**Level of practice**		
Variable	Good (%)	Poor (%)	*p*-value	Favor-able (%)	Unfavo-rable (%)	*p*-value	Per-formed (%)	Not Per-formed (%)	*p*-value
Kulliyyah			0.052			0.001			0.00
AIKOL	2 (10.0)	18 (90.0)		14 (70.0)	6 (30.0)		3 (15.0)	17 (85.0)	
KAED	9 (40.9)	12 (5.71)		8 (38.1)	13 (61.9)		3 (14.3)	18 (85.7)	
KENMS	9 (29.0)	22 (71.0)		8 (25.8)	23 (74.2)		3 (9.7)	28 (90.3)	
KIRKHS	23 (39.0)	36 (61.0)		24 (40.7)	35 (59.3)		5 (8.5)	54 (91.5)	
KLM	5 (55.6)	4 (44.4)		3 (33.3)	6 (66.7)		2 (22.2)	7 (77.8)	
KOE	50 (37.3)	84 (62.7)		72 (53.7)	62 (46.3)		13 (9.7)	121 (90.3)	
KOS	10 (55.6)	8 (44.4)		6 (33.3)	12 (66.7)		3 (16.7)	15 (83.3)	
KOED	2 (25.0)	6 (75.0)		1 (12.5)	7 (87.5)		1 (12.5)	7 (87.5)	
KOM	11 (47.8)	12 (52.2)		19 (82.6)	4 (17.4)		11 (47.8)	12 (52.2)	
KON	9 (50.0)	9 (50.0)		17 (94.4)	1 (5.6)		13 (72.2)	5 (27.8)	
KOD	5 (71.4)	2 (28.6)		5 (71.4)	2 (28.6)		4 (57.1)	3 (42.9)	
KAHS	12 (57.1)	9 (42.9)		15 (71.4)	6 (28.6)		8 (38.1)	13 (61.9)	
KOP	9 (52.9)	8 (47.1)		12 (70.6)	5 (29.4)		7 (41.2)	10 (58.8)	
Sources of information			0.79			0.006			0.053
Health workers	10 (47.6)	11 (52.4)		5 (23.8)	16 (76.2)		5 (23.8)	16 (76.2)	
Health/sex education	22 (39.3)	34 (60.7)		34 (60.7)	22 (39.3)		16 (28.6)	40 (71.4)	
Parents and teachers	75 (41.9)	104 (58.1)		107 (59.8)	72 (40.2)		25 (14.0)	154 (86.0)	
Mass media	49 (37.7)	81 (62.3)		64 (49.2)	66 (50.8)		30 (23.1)	100 (76.9)	

AIKOL: Ahmad Ibrahim Kulliyyah of Laws, KAED: Kulliyyah of Architecture and Environmental Design, KENMS: Kulliyyah of Economics and Management Sciences, KOED: Kulliyyah of Education, KOE: Kulliyyah of Engineering, KIRKHS: Kulliyyah of Islamic Revealed Knowledge and Human Sciences, KLM: Kulliyyah of Languages and Management, KOM: Kulliyyah of Medicine, KOD: Kulliyyah of Dentistry, KOP: Kulliyyah of Pharmacy, KON: Kulliyyah of Nursing, KAHS: Kulliyyah of Allied Health Sciences, KOS: Kulliyyah of Scienc

Attitudes among Male Students in CFS IIUM Towards TCa and TSE

In this study, more than half of the respondents (52.8%) have favorable attitude towards TCa and TSE. This was higher than other related studies done in Bharatpur (1) and Enugu (5). This discrepancy might be due to the variation of geographic and questionnaire used, respectively. The finding in the current study that showed at least 70% of respondents agreed that TSE can help in early detection of TCa, which indicates a good treatment-seeking behavior among them.

The current study also showed that 38.3% of the respondents gave neutral respond on the TSE should be done once in a month, which was slightly lower percentage than the study conducted in Bharatpur College (1). Although the overall attitude of respondents in the current study is at a favorable level, their attitude towards occurrence of TCa and age at risk of men regarding TCa was disappointing, as shown by item 3 and 4 in **Table 3**. This may be partly contributed by their level of knowledge, which most of the respondents have poor knowledge regarding risk factors of TCa as shown in Table 5.

Practice of TSE among Male Students in CFS IIUM

TSE is crucial for the early detection of TCa (1). Early diagnosis is associated with reduced mortality, and management will be easier and less harmful treatment (8). Disappointingly, the percentage of respondents in this study who practiced TSE was low, which as 9.7%. Among this, only 25.0% of the students practiced TSE correctly, which was once a month. The finding is consistent with other studies which reported poor practice of TSE among male students in the universities (1,5,7,9). As tabulated in Table 4, a high percentage of respondents (51.3%) admitted that they did not perform TSE due to not having knowledge. The findings were supported by several studies, where the students were not performing the TSE due to the same reason (1,5,7). It indicates that poor practice of TSE among the majority of respondents may be related to insufficient knowledge on TSE.

However, knowledge of TSE encompasses not only the frequency of the examination, but also the steps of performing TSE, which was not addressed in the questionnaire. A future research is needed to justify the detailed reasons for young male population not practicing the TSE. Therefore, it was suggested that complete and precise information on TCa and TSE should be disseminated among the young population. Provision of sufficient knowledge on TCa and TSE to them may eventually increase the percentage of young males to practice the TSE.

Association Between KAP of TCa and TSE with Sociodemographic Characteristics

The current study found that there was a significant association between level of attitude and practice with type of study programmes, or Kulliyyah. To the best of our knowledge, there was no studies reported the association between the level of these variables with Kulliyyah. However, a study by Alemu and Baih (4) reported that students in clinical year had good practice toward TSE than preclinical year of study. In other words, the exposure among students may influence their practice, where students in clinical-based programmes tend to practice the knowledge they learnt as compared to non-clinical-based programmes. In the current study, the study population consisted of 22.2% clinical-based programmes only, namely KOM, KON, KOP, KAHS & KOD, which cumulatively contributed to the low level of practice of TSE. Although the study by Alemu and Baih (4) did not report the attitude towards TCa and TSE among their study population, Peltzer and Pengpid (10) showed that positive attitude towards TSE was highly associated with TSE practice. Nevertheless, the current study found the favorable attitude towards TSE in the study population with poor practice of TSE. This may be contributed by poor level of knowledge among the respondents, where the results in the Table 4 shows that majority of them were not practicing TSE due to not having knowledge on TSE.

The current study also revealed that there was a significant association between level of attitude and sources of information, where it was consistent with the previous studies (1,4,6,7). The current study found that parents and teachers were the sources of information among the majority of respondents. This result has been supported by Dhakal et al. (1) who found that the respondents with sources of information from parents and teachers was 1.956 times more likely to have favorable attitude. It is proven that parents have a significant impact on their

children's lives and play an important role in the formation of a healthy society (11). However, in terms of practice of TSE, the current study found a contradicted result with Dhakal et al. (1), whereas respondents who obtained information from parents and teachers were associated with poor practice of TSE. Buhr and Tannen (12) revealed that 55.8% of parents showed inadequate knowledge on health. Therefore, misconception or imprecise information from parents regarding health issues may contribute to poor practice of TSE among their children. This indicates the need for the relevant authority to address the issue through improved health promotion and educational efforts, such as the implementation of a community health program that targets parents as participants to enhance their knowledge about health, as well as to correct any health misconceptions among them.

CONCLUSION

The current study has successfully achieved the study objectives. The level of knowledge and practice of TCa and TSE among the male students in CFS IIUM were poor. In contrast, the attitudes of respondents were at a favorable level. Furthermore, the analysis also showed a significant association between attitude with Kulliyyah and sources of information, as well as practice and sources of information. This might further help in identifying some causal factors that could led to the current situation in the future study.

The findings in the current study reflect the importance of enhancing the KAP of TCa and TSE among the young male population. Having poor knowledge will increase the risk for late detection of TCa, which complicates the outcomes of treatment. Hence, to alleviate the issue, it is crucial to undertake appropriate efforts, such as educational and awareness campaigns about TCa and proper TSE technique among the targeted population. Media platforms have been suggested as knowledge dissemination tools as it is shown to be among the preferential sources of information among pre-university students.

CONFLICT OF INTEREST

The authors declared that there is no conflict of interest.

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AUTHOR CONTRIBUTIONS

NFR: Writing the manuscript, data collection and data analysis.
NANA: Data collection and data analysis.
AA: Reviewing and editing the manuscript.

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