

Breast Cancer Awareness, Screening Practices And Help-Seeking Barriers Among University Students In Malaysia: A Cross-Sectional Study

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Abstract

Background: The prevalence of breast cancer has been rising globally, and it is starting to be seen more commonly among young women nowadays. Well-developed knowledge and attitude are crucial in preventing breast cancer and its complications.

Objective: This study aimed to assess awareness, screening practices and help-seeking barriers of breast cancer among university students.

Materials and Methods: This was a cross-sectional study carried out in Universiti Tunku Abdul Rahman (UTAR), Selangor, Malaysia over a 4-month period. The inclusion criteria were aged ≥ 18 years and currently enrolled as a student at UTAR. A stratified convenience sampling method was used, and data was collected using a self-administered questionnaire. The questionnaire covered breast cancer awareness contents from the B-CAM module. Data was analyzed using descriptive statistics, Pearson's chi-square tests, independent t-test and ANOVA test.

Results: A total of 534 participants were recruited. Most of the participants were Chinese population (91.4%) and most of the respondents were undergraduate students. Among them, 24.7% of the respondents performed breast self-examination (BSE). There was statistically significant association between gender and breast self-examination ($p < 0.001$). Moreover, the relationship between faculty groups and the frequency of performing BSE regularly was also known to be statistically significant ($p = 0.047$). In addition, the total barrier scores were significantly associated with faculty and age groups with $p = 0.014$ and $p = 0.023$ respectively.

Conclusion: Overall, a clear disparity was observed between gender and faculty groups regarding regular BSE practices. Furthermore, psychological barriers such as fear and embarrassment were the most significant deterrents that hinder university students from seeking medical advice regarding breast health.

Keywords: Breast Cancer, Awareness, Knowledge, Screening practice, Help-seeking Barriers

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I. Introduction And Background

Breast cancer is one of the most common conditions worldwide nowadays, which is characterized by uncontrolled cell growth in breast tissue (1) and it has been one of the major public health burdens in both developing and developed countries. (2) Over the past few years, the incidence rates have increased dramatically with the age-standardized incidence. Based on the current statistics, approximately 1 out of every 19 females in Malaysia have the risk of developing breast cancer during their lifetime compared with Europe, having better incidence rates of one in 8 females. This may be due to the availability of healthcare facilities and services which could prompt early detection of breast cancer. (3)

Based on the data from the Ministry of Health of Malaysia, there was a continuous spike in the age-standardized occurrence rate of breast cancer from 34 per 100,000 in 2012 to about 48 per 100,000 in the year of 2019. Its high prevalence is mainly attributed to Malaysia's aging citizens and unhealthy lifestyle practices. (4) By identifying gaps in knowledge, awareness, prevention strategies, and perceived barriers, this research would allow more targeted, age-appropriate educational outreach, which offers early detection of breast cancer and significantly leads to reduction in national healthcare burdens related to cancer treatment and late-stage diagnosis. (5)

Moreover, at the institutional level, the study of knowledge, awareness, screening practices and perceived barriers of breast cancer will be beneficial to the institution. This is because the results obtained from the study could be a guidance to the development of campus-based intervention activities such as health talk and screening workshops to develop better health results. Empowering students with well-grounded knowledge can also reinforce the university's role in creating socially responsible, health-conscious graduates. (6) Hence, this

study was conducted to evaluate the level of breast cancer awareness among university students which could ultimately reduce the mortality rates and enhance the future quality of life for women in Malaysia.

II. Materials And Methods

Study population

This study targeted the students who were currently enrolled in Universiti Tunku Abdul Rahman (UTAR), Selangor, Malaysia at the time of conducting research. The study population comprised foundation, undergraduate and postgraduate students which form a diverse academic environment that included individuals from various faculties across all campuses of UTAR which collectively represent a broad geographical distribution, with individuals originating from various states across Malaysia. This diversity enhances the generalizability of the findings to the wider Malaysian youth population. Inclusion criteria included aged ≥ 18 years and able to understand and respond to the questionnaire in any of the offered languages provided (English, Bahasa Malaysia, or Mandarin).

Those with a prior diagnosis of breast cancer were excluded to minimize potential confounding factors related to pre-existing health conditions. A total of 534 participants were recruited in our study.

Study design

This study utilized a stratified convenience sampling method to recruit respondents among students from all UTAR campuses. This is to ensure representation across faculties, gender, and academic levels among UTAR students. Participation was limited to students who met the inclusion criteria and were willing to provide informed consent.

Study tool and method of measurement

A self-validated questionnaire was distributed through both physical and online platforms. A physical QR code which leads to the questionnaire was also administered at the common areas around the university compound. The questionnaire was constructed into multiple sections, consisting of informed consent followed by a set of sociodemographic variables, breast self-examination (BSE), seeking help and potential barriers through a series of “Yes, often”, “Yes, sometimes” and “No” questions. In this section, respondents were asked questions about their frequency of performing BSE and potential barriers that might hinder them from seeking help. Finally, the last section was used to evaluate the knowledge level of clinical breast examination (CBE) and mammogram through a series of 5-point Likert scale questions ranging from “Strongly agree” to “Strongly disagree” together with the “No reply” option. The scoring scheme of the B-CAM instrument was used to compute the barrier scale (10 items) where the answer of “yes, often” was given 2 points, 1 point for “yes, sometimes” and 0 point for “no” answer. The higher points reflected a greater perceived barrier.

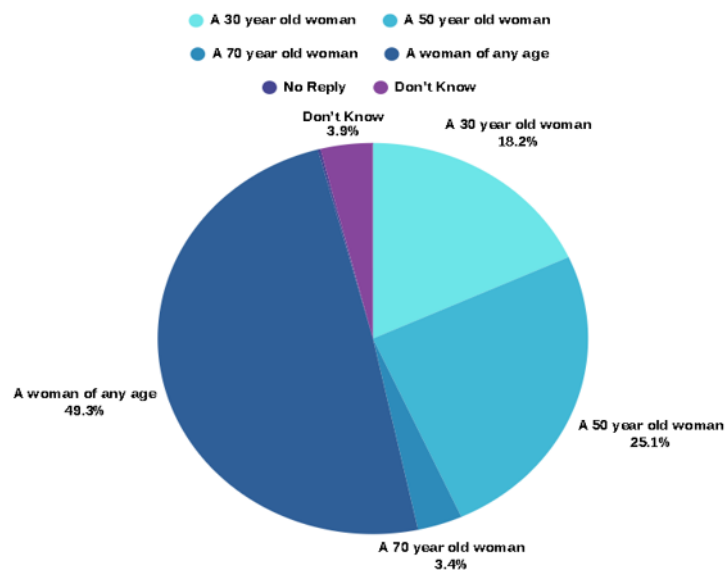
Data analysis

The statistical software program SPSS V30.0 by IBM USA Inc was used to analyze the data collected. Descriptive statistics were used to provide an overview of a specific data collection. Under the descriptive statistics, measures of central tendency and dispersion were used to describe the data, whereas the inferential statistics were used to make an inference of a population based on sample data from the population. A p-value of 0.05 and 95% CI was used as statistically significant.

III. Results

A self-administered questionnaire was distributed both physically and online across both campuses, and an online questionnaire in the Google Form format was circulated via UTAR email. The online survey remained open for 17 days along parallel physical survey. Initially, 550 responses were collected, however, after excluding incomplete responses and applying the exclusion criteria, a total of 534 valid responses remained.

Figure 1. Overall awareness of age risk associated with breast cancer of respondents (n=534)
Overall Awareness of Age Risk of Respondents



Based on figure 1, the overall respondents' (n=534) awareness of age risk associated with breast cancer was classified into 4 risk groups which were 'A 30-year-old woman', 'A 50-year-old woman', 'A 70-year-old woman', and 'A woman of any age'. Out of that, only 25.1% of respondents answered correctly which was 50-year-old women as being classified at the highest risk of developing breast cancer. Besides that, the results showed 49.2% of the respondents mistakenly believed that women would develop breast cancer at all ages with equal risk. On top of that, the B-CAM module implemented options of "No Reply" and "Don't Know" in this section comprised 0.2% and 3.9% respectively from the participants. Hence, it was known that only 25.1% of the respondents were aware of the age risk associated with breast cancer and predominantly 74.9% of respondents were not aware of it.

Table 1. Barriers stopping individuals from going to the doctor regarding the breast examination (n=534)

Barriers	n (%)				
	No	Yes, often	Yes, sometimes	No Reply	Don't Know
Too embarrassed to go and see the doctor	266 (49.8)	60 (11.2)	161 (30.2)	18 (3.4)	29 (5.4)
Too scared to go and see the doctor	277 (51.9)	80 (14.9)	143 (26.8)	17 (3.2)	17 (3.2)
Worried about wasting the doctor's time	444 (83.1)	18 (3.4)	40 (7.5)	19 (4.6)	13 (2.4)
Difficult to find doctor to talk	374 (70.0)	35 (6.6)	75 (14.0)	24 (4.5)	26 (4.9)
Difficult to make an appointment with the doctor	341 (63.8)	48 (9.0)	88 (16.5)	23 (4.3)	34 (6.4)
Too busy to make time to go to the doctor	199 (37.3)	105 (19.6)	195 (36.5)	18 (3.4)	17 (3.2)
Too many other things to worry about	215 (40.3)	122 (22.8)	161 (30.2)	15 (2.8)	21 (3.9)
Difficult to arrange transportation to the clinic	368 (68.9)	43 (8.1)	90 (16.9)	13 (2.4)	20 (3.7)

Worry about what the doctor might find may stop them from going to the doctor	352 (65.9)	55 (10.3)	75 (14.0)	24 (4.5)	28 (5.2)
Not feeling confident talking about their symptoms with the doctor	318 (59.6)	60 (11.2)	116 (21.7)	15 (2.8)	25 (4.7)
Total Score, Mean (SD*)	4.49 (3.807)				

Descriptive statistics. Categorical data presented with frequency and percentage. Numerical data presented with mean and standard deviation. *SD, standard deviation

Figure 2. Total barrier score among UTAR students (n=534)

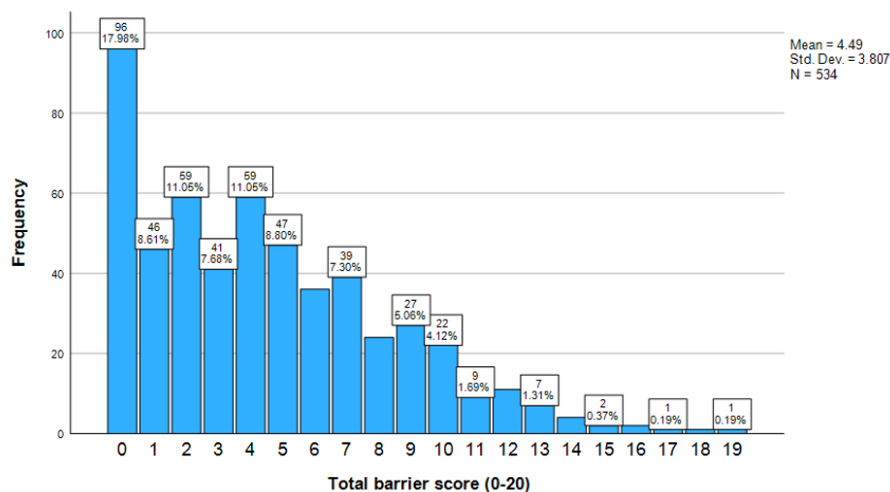


Table 1 and figure 2 showed the barriers stopping individuals from going to the doctor regarding their breast examination and the total barrier score. The data computed that the overall mean barrier score was $4.49 \pm$ standard deviation of 3.807 with a range of 0 to 19 and median score of 4.00. From the table, it suggested a low barrier level among respondents. The majority of the respondents ranked psychological as the most accounted for barrier of seeking help which included fear, worry, and embarrassment. Among 534 respondents, 122 (22.8%) of them suggested that they often have too many things to worry about which hinder them from seeking help from a doctor. Besides that, a fraction of the participants (195, 36.5%) felt that sometimes it was too busy to make time to go to the doctor. On the other hand, predominantly (444, 83.1%) of the respondents had no barrier that suggested worrying about wasting the doctor's time that holds them back from seeking help.

Based on the screening behaviors, BSE was found to be very low, where only 20.2% reported practicing regular BSE which included practicing at least once a week or once a month. While most of the respondents (275, 51.5%) were found rarely or never practiced BSE before. Followed by a part of respondents, 55 (10.3%) were practicing BSE at least once every 6 months. Lastly, a total of 37 (6.9%) and 59 (11.1%) respondents gave "Don't Know" and "No Reply" for their frequency of practice BSE. From the distribution of respondents who had clinical breast examination (CBE) in the past year data, we could deduce that only 51 (9.6%) of the respondents had performed CBE for the past year, which suggested poor screening practice for CBE. A predominant number of the respondents (351, 65.7%) claimed that they had not yet practiced CBE within 1 year from the date of data collection. Meanwhile, a total of 61 (11.4%) and 71 (13.3%) respondents answered with "Don't Know" and "No Reply" respectively.

Furthermore, the distribution of respondents who practiced mammograms for the past two years showed only 29 (5.4%) of the respondents had practiced mammograms for the past two years, which suggested very low practice behavior. Most of the respondents (395, 74%) stated that they did not have a mammogram done for the last two years. While a fraction of the respondents 45 (8.4%) and 65 (12.2%) indicated that they "Don't Know" and have "No reply" respectively for this question.

Table 2. Association between sociodemographic characteristics and regular BSE practice (n=534)

Sociodemographic characteristics		df	Regular BSE practice (Monthly/Weekly), n (row %) (column %)		Chi-Square value	p-value
			No	Yes		
Gender	Male	2	153 (89.0)	19 (11.0)	13.248 ^a	<0.001*
	Female		270 (75.4)	88 (24.6)		
Age group (Years)	≤20	2	198 (81.8)	44 (18.2)	1.349 ^a	0.509
	21-24		214 (77.8)	61 (22.2)		
	≥25		14 (82.4)	3 (17.6)		
Ethnic group	Malay	3	3 (100.0)	0 (0.0)	5.644 ^a	0.130
	Chinese		394 (80.7)	94 (19.3)		
	Indian		25 (69.4)	11 (30.6)		
	Others		4 (57.1)	3 (42.9)		
Highest education level	Foundation/Diploma Pre-University	2	186 (81.2)	43 (18.8)	2.537 ^a	0.281
	Undergraduate		233 (78.2)	65 (21.8)		
	Postgraduate		7 (100.0)	0 (0.0)		
Faculty group	Non-Health Sciences	1	356 (81.3)	82 (18.7)	3.412 ^a	0.047*
	MK FMHS		70 (72.9)	26 (27.1)		

Pearson Chi-square independent test, level of significance at $p < 0.05$. * p -value < 0.05 . f, Fisher-Freeman-Halton Exact Test. df, degree of freedom. Non-health related faculties, other faculties except M. Kandiah Faculty of Medicine and Health Sciences.

Table 2 showed the association between sociodemographic characteristics with respect to regular BSE practice. Sociodemographic variables like gender and faculty group of the respondents were known to be statistically significant with the frequency of performing BSE regularly. Around 90% of the male respondents did not perform BSE and only nearly 10% of them had ever performed BSE. More than 75% of the female respondents claimed that they did not perform BSE and a small fraction of them ($< 25\%$) ever perform BSE. This finding showed that the female population performed BSE more than male. There was statistically significant association between gender and breast-self-examination [X^2 (2, $n=534$) = 13.248, $p < .001$]. Besides that, the relationship between faculty groups and the frequency of performing BSE regularly was also known to be statistically significant ($p < 0.047$).

Table 3. Sociodemographic (Gender) difference in mean knowledge and barriers (n=534)

Variable (Gender)	Mean score (Std. Deviation)		Levene's Test for equality of Variances F(sig.)	Mean differen ce	t(df)	Two- tailed p-value	95% CI
	Males	Females					
Total symptom knowledge score (0-11)	6.44 (2.87)	7.33 (2.63)	1.084 (0.298)	-0.90	-3.561 (528)	<0.001*	(-1.391, -0.402)
Total risk knowledge score (0-9)	3.99 (2.35)	4.26 (2.37)	0.317 (0.574)	-0.27	-1.212 (528)	0.226	(-0.696, 0.165)
Total barrier score (0-20)	3.80 (3.87)	4.80 (3.73)	0.744 (0.389)	-1.00	-2.860 (528)	0.004*	(-1.691, -0.314)

Independent T test, level of significance at $p < 0.05$. * p -value < 0.05 . df, degree of freedom. 95% CI, 95% confidence interval

Table 3 showed the association between gender and difference in knowledge and barriers mean score pertaining to breast cancer. The association was assessed using an independent sample T-test. For the total symptom knowledge mean score, the p -value for Levene's test for equality of variances is 0.298, which is more than 0.05. Thus, equality of variances was met. The mean difference is -0.90 and the standardized difference, $t = -3.561$. Thus, there was a difference in total symptom knowledge mean score between male and female respondents. The total symptom knowledge mean score was higher among females than males. For the total barrier mean score, the p -value for Levene's test for equality of variances is 0.389, which is more than 0.05. Thus, the equality of variances is met. The total barrier score is higher among females than males.

Table 4. Sociodemographic (Faculty) difference in mean knowledge & barriers (n=534)

Variable (Faculty)	Mean score (Std. Deviation)		Levene's Test for equality of Variances F(sig.)	Mean differenc e	t(df)	Two- tailed p-value	95% CI
	Health science faculty (MK FMHS)	Non-health science faculties					
Total symptom knowledge score (0-11)	8.69 (2.24)	6.65 (2.73)	5.086 (0.025) *not met	-2.04	-7.750 (532)	<0.001*	(-2.559, -1.520)
Total risk knowledge score (0-9)	5.72 (2.24)	3.82 (2.25)	0.088 (0.766)	-1.90	-7.502 (532)	<0.001*	(-2.402, -1.415)
Total barrier score (0-20)	3.63 (3.57)	4.68 (3.84)	2.304 (0.130)	1.05	2.461 (532)	0.014*	(0.212, 1.890)

Independent T test, level of significance at $p < 0.05$. * p -value < 0.05 . df, degree of freedom. 95% CI, 95% confidence interval. Non-health related faculties, other faculties except M. Kandiah Faculty of Medicine and Health Sciences

Table 4 showed the association between faculty groups and the difference in knowledge & barriers mean score regarding to breast cancer. The association was also assessed using an independent sample T-test. For the total symptom knowledge mean score, the p -value for Levene's test for equality of variances is 0.025, which is less than 0.05. Thus, the equality of variances was not met. The mean difference is -2.04 and the standardized difference, $t = -7.750$. The two-tailed p -value of the test is <0.001 , which is less than 0.05. The 95% CI for mean difference is $[-2.559, -1.520]$, which does not contain 0. Since the 95% CI for mean difference does not contain the tested value of 0 and the p -value of the test is less than 0.05.

Moreover, for the total risk knowledge mean score, the p -value for Levene's test for equality of variances is 0.766, which is more than 0.05. Hence, the equality of variances was met. The mean difference is -1.90 and the standardized difference, $t = -7.502$. The two-tailed p -value of the test is <0.001 , which is less than 0.05. The 95% CI for mean difference is $[-2.402, -1.415]$, which does contain 0. Since the 95% CI for mean difference does not contain the tested value of 0 and the p -value of the test is less than 0.05. Thus, there is a difference in total risk knowledge mean score between health-science faculty (MK-FMHS) and non-health science faculties. The two-tailed p -value of the test is 0.014, which is less than 0.05. The 95% CI for mean difference is $[0.212, 1.890]$, which does not contain 0. Since the 95% CI for mean difference does not contain the tested value of 0 and the p -value of the test is less than 0.05. Thus, there is a difference in total barrier mean score between health-science faculty (MK-FMHS) and non-health science faculties. Overall, these statistically significant analysis data showed that the total symptom knowledge, risk knowledge and barrier mean scores are higher among the students of health-science faculty (MK-FMHS) than non-health science faculties.

Table 5. Sociodemographic (Age group) difference in knowledge & barriers (n=534)

Variable (Age groups)	Mean score (Std. Deviation)			Levene's statistic (mean sig.)	F	df	Two- tailed p-value
	≤20	21–24	≥25				
Total symptom knowledge score (0-11)	6.41 (2.76)	7.49 (2.61)	7.82 (3.56)	0.144	11.06	(2, 531)	<0.001*
Total risk knowledge score (0-9)	3.80 (2.20)	4.44 (2.46)	4.71 (2.57)	0.084	5.19	(2, 531)	0.006*
Total barrier score (0-20)	4.31 (3.61)	4.74 (4.02)	2.94 (2.38)	0.031	2.30	(2, 531)	0.101

Independent T test, level of significance at $p < 0.05$. * p -value < 0.05 . df, degree of freedom.

Table 5 showed the association between age groups (years) and the difference in knowledge & barriers mean score regarding breast cancer. The association was analyzed using a One-way ANOVA and post-hoc test. The total symptom knowledge and the total risk knowledge mean scores showed statistically significant ($p < 0.05$).

IV. Discussion

From our study, we observed that only 24.7% of participants performed regular breast self-examination (BSE) among UTAR students with frequency ranked higher for rarely/never, weekly, 6 months once, to monthly. This poor result highlighted the “know-do” gap where good knowledge regarding breast cancer does not directly integrate into good practice behavior. This finding was aligned with the several previous studies conducted regarding to breast screening practices. For instance, a similar result was observed from a study done in one of the Malaysia universities where only 15% of the female students practiced BSE regularly. (7)

According to Rasool *et al* (8), a study conducted in Pakistan showed that 43.8% of the undergraduate students knew the way to perform BSE, but among them only 24.9% had ever done. This further emphasizes the importance of closing the “know-do” gap. Besides that, a study conducted in Debre Berhan University, Ethiopia (9) showed that a small percentage (28.3%) had ever performed BSE among the university students. A similar result was reported in Ghana (10), where 75% of the medical students understood the importance of performing BSE monthly, yet only 23.4% of them performed it monthly. To relate with UTAR students' context, students

may know what BSE is, but barriers such as lack the confidence or proper procedural training to perform it effectively may hinder them from practicing in which Yip *et al* study (11) described that awareness alone is insufficient to translate into practice if not supported by skills and motivation.

Additionally, it is observed that the overall barrier score was relatively low with a mean of 4.49. Among 534 responses, some of the respondents (96, 17.98%) scored 0 for the total barrier score of 20. The pattern was observed to decline gradually to a total score of 18 and 19, which only one respondent scored each. From the data, top-ranked barriers were known to be psychological and behavioral barriers which reflect business, worried, embarrassed and scared are more significant than those logistical barriers where most of the respondents had no issues with transportation.

There were few similar findings reported from Malaysia where they stated that embarrassment and shyness serve as one of the main reasons, women delay their seeking breast screening even though more than 80% of the women had good knowledge regarding breast cancer. (6) Besides that, another study conducted in the same region found that fear of mammogram pain demoralizes the women population from undergoing screening practices. Their study showed that 68% of women were aware about mammography but only 15% had performed screening with the main deterrents being fear and time constraint. (12) This again proved that having good knowledge doesn't necessarily translate into action. On the other hand, there is an inconsistent finding observed from a study conducted in Iran (13) where perceived barriers that hinder seeking medical advice remained high with major deterrents being fear and embarrassment. To relate with our study, UTAR students predominantly demonstrated an overall low barrier score which suggests they do not perceive many obstacles to seeking help that are related to breast cancer. But it is undeniable that university students might have social desirability bias, where some of them may respond with what they believe is the "correct" or socially acceptable answer. For instance, they would seek medical help and perform screening practices even if they would not in reality. This could lead to false low barrier scores in self-reported questionnaires. It is to be known that participants tend to underreport health-related barriers to align with social norms. (14)

Moreover, there was a statistically significant association between gender to knowledge level and barriers score where it is observed that female students exhibited higher symptom knowledge ($p<0.001$) and higher barriers score ($p=0.004$) to compare with male students. But there was no statistically significant association between gender and risk knowledge. This finding was aligned with the previous study conducted in Malaysia (15) where females showed higher symptom knowledge ($p=0.005$) and no gender disparity in risk knowledge with $P=0.702$. Besides that, another study conducted in Saudi Arabia (16) suggested that females had higher symptom knowledge than male with significant p value ($p<0.001$). However, the findings of this study were found to be inconsistent with the previous study conducted in UTAR by Foo *et al* (3) where they reported that there was no significant association between gender and overall knowledge of breast cancer with p -value of 0.13. This was because equal education courses were given for both male and female students in their study environment which may have equal access to health-related courses, social media, and awareness campaigns. Hence, if awareness campaigns are conducted inclusively and campus-wide, both genders may have the same benefit which leads to similar knowledge levels.

Furthermore, there was statistically significant association between faculty groups to knowledge and barriers pertaining to breast cancer in our study where health science students from M. Kandiah Faculty of Medicine and Health Sciences (MK FMHS) showed greater knowledge score ($p<0.001$) and lower barriers score ($p=0.014$) to compare with their peers from non-health related faculties. These findings were aligned with the study conducted in Southern Punjab (17) where it is reported that medical students have better knowledge regarding breast cancer compared with non-medical students ($p<0.05$). Moreover, another study in Lahore (13) found that clinical students had higher knowledge and lower barriers compared with pre-clinical students in a medical course. In our study, health sciences students which include those students who enrolled in medicine, nursing, traditional and complementary medicine and physiotherapy courses received a more constructive and structured education about breast cancer through coursework and clinical placements which would directly increase their awareness and knowledge regarding breast cancer. (18)

Interestingly, there was also a statistically significant association between age groups with knowledge level and barriers perceived. Based on the one-way analysis of variance (ANOVA) conducted in our analysis, we found that age differences in symptom knowledge with p -value less than 0.001 and risk knowledge, $p=0.006$, however there was not statistically significant towards barriers ($p=0.101$). In addition, a post-hoc test was conducted to compare all possible pairs of means to determine the specific subgroup that shows significant association to each other. Based on Tukey's HSD (Honestly Significant Difference) test with Levene's p -value more than 0.05 and equal variances were assumed that age 21-24 reported exhibit higher knowledge to compare those age groups ≤ 20 . However, the Games-Howell test was used with Levene's p -value was less than 0.05 and equal variances were not assumed, showing that age group 21-24 reported having higher barriers compared to age group ≥ 25 . This group was interpreted cautiously due to the very small sample size ($n=17$). This was inconsistent

with the study conducted in Turkey female pharmacy students (19), where they found out that there was no significant relationship between age/academic year and knowledge level ($p>0.05$).

Based on the previous study conducted in UTAR (3), barriers such as fear of diagnosis, embarrassment, and time constraints were found to be influenced more by personal perception, attitudes, and emotional, which was not necessarily by age. For example, a 21-year-old and a 25-year-old respondent were hesitant to perform BSE due to discomfort or stigma, even if their knowledge differs. This showed that perception of barriers is deeply rooted in personal and sociocultural factors, not merely at one's age. However, to compare with our study, the majority of students in UTAR are aged 18–25, which suggests a narrow range that leads to limited age variability in barrier perception. This homogeneity of variables will cause reduction in statistical power to detect significant differences in barrier scores. (20)

There was also a statistically significant association link between gender and BSE practice where females perform more and regularly than males. This was supported by a study conducted in Malaysia (21), where most believed that BSE is not important for males due to relatively lower risk of developing breast cancer than females. Another study conducted in Turkey (22) showed similar findings where only 9.2% of males compared to 69.6% of females had ever performed BSE in their lifetime. Health sciences students, those who enrolled in UTAR MK FMHS, were found to be practicing more compare with their peers, which are from other faculties. This finding was aligned with the study conducted by Tiongco *et al* (23) which suggested that knowledge and practices were observed higher in health science students than non-health science majors. However, there was an inconsistent finding reported in Morocco (24), described that there was no significant link between BSE practice and age, marital status, year, study option, or information source.

Moreover, sociodemographic characteristics like age group, ethnicity, and educational level showed no significant association towards practice of BSE. These findings were consistent with the study conducted in Ethiopia (25) where there was no significant association found between BSE practice and sociodemographic factors like age, marital status, residence, department, year of study, income, or parents' education.

V. Conclusion

In conclusion, based on the results, UTAR students exhibited greater awareness and understanding regarding breast cancer to compare with their peers who are males and from non-health sciences faculties. Besides that, a clear disparity was observed between gender and regular breast self-examination (BSE) practices, with females practicing BSE significantly more than males. Furthermore, screening behaviors were low. Lastly, psychological barriers such as fear and embarrassment were the most significant deterrents that hinder university students from seeking medical advice regarding breast health. These results emphasize the need for targeted education initiatives along with more in-depth studies on the attitude and perception of breast cancer within universities. Efforts should go beyond and further study is needed to elucidate in simply increasing awareness, focusing instead on providing clear, accurate information about prevention strategies, early warning signs, and the importance of timely breast cancer screening to effectively bridge the knowledge gap.

VI. Limitations And Recommendations

There were some limitations that we encountered in this study. Firstly, our study has proposed that the target population should be only students that enrolled in one university. This would lead to low generalizability due to lack of data obtained from other universities even though the sample size that is being considered in this research was large. Additionally, an exploratory cross-sectional study design has been used in this research to capture data at a single point in time to observe the pattern of prevalence of awareness, screening practices, and perceived barrier of breast cancer among UTAR students. Furthermore, this research was also susceptible to recall bias as the results of the collected data might be influenced by the current state of knowledge and awareness of breast cancer of the respondent. Lastly, the method used in questionnaire distribution through online resources will cause lack of opportunity for the respondent to clarify any of their doubts of the questions. This group of respondents does not have immediate access to real-time clarification, which may lead to misinterpreting or misunderstanding of certain questions. Thus, it may cause variability of quality and accuracy of the results.

Ethical Approval

The approval was obtained from the UTAR Scientific and Ethical Review Committee (SERC).

Declarations

- **Competing interests:** None
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Author's Contribution

Goh Chong Lee was principal author who performed sample collection, demographic data collection, conceptualized the manuscript, wrote background, methods, results and discussion of the manuscript, performed data analysis, interpretation of the results, and revised the final drafts of the manuscript.

Shwe Sin, Aynett Kaur, Hnin Pwint Phyu assisted in conceptualization of the manuscript and data analysis.

Claudia Chin Xien Huey, Gan Choak Meng, Yong Yun Yin performed sample collection, demographic data collection, assisted in conceptualization of the manuscript and data analysis.

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