

**KNOWLEDGE AND ATTITUDE TOWARDS WOMEN'S BREAST CANCER
AND ITS ASSOCIATED FACTOR AMONG MALE EMPLOYEES OF
UNIVERSITI SAINS MALAYSIA HEALTH CAMPUS**

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**DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF MASTER OF
MEDICINE
(FAMILY MEDICINE)**

UNIVERSITI SAINS MALAYSIA

2022

ACKNOWLEDGEMENT

I sincerely appreciate the Almighty God for the graces, strength, sustenance, and above all, His love from the beginning of my academic life. His benevolence has made me excel and be successful in my academic pursuits. I would like to express my sincere thanks and gratitude to my supervisor, Dr Siti Suhaila binti Mohd Yusoff for her advice, guidance, and support in conducting this research project and completion of this dissertation, as well as the whole duration of my training in family medicine master's in medicine program in the Department of Family medicine, Hospital Universiti Sains Malaysia.

I would also like to thank my co-supervisors, Associate Professor Rosediani Muhamad, from Department of Family Medicine, School of Medical Science, University Sains Malaysia and Dr Tengku Alina Tengku Ismail from Department of Community Medicine, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia. I was indebted to Associate Professor Dr. Norhayati Binti Mohd Noor for helping in statistical analysis and providing advice. I would like to acknowledge Dr. Nik Mannan for helping me to collect data in Universiti Sains Malaysia (USM) Health Campus before starting his career as a houseman.

My deepest gratitude goes to my parents and family members, especially my husband, Dr. Muhammad Faiz bin Affandi and both of my children Damia Batrisyia and Muhammad Danish whose patience and encouragement have made the completion of this study possible. Special thanks to my mother Pn Rosliza Abdul Malik for her endless support and prayer for my journey.

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ABSTRAK

Pengenalan: Kanser payudara merupakan kanser yang paling lazim dalam kalangan wanita Malaysia. Ketika pertama kali didiagnosis, separuh daripada pesakit kanser payudara Malaysia sudah berada di tahap akhir. Salah satu faktor yang menyumbang kepada kelewatan itu ialah kurangnya pengetahuan dan sikap negatif tentang kanser payudara. Walaupun kanser payudara lebih kerap berlaku pada wanita berbanding lelaki, lelaki masih perlu dimaklumkan dengan secukupnya kerana lelaki memainkan peranan besar bagi wanita membuat keputusan mengenai kesihatan mereka. Mengambil kira faktor tersebut, matlamat utama kajian ini adalah untuk menilai pengetahuan dan sikap kaum lelaki terhadap kanser payudara di kalangan wanita. Kami juga ingin mengkaji faktor-faktor yang menyumbang kepada pengetahuan yang bagus terhadap kanser payudara. Selain itu, kami ingin menyiasat kaitan antara pengetahuan dan sikap lelaki mengenai kanser payudara.

Metodologi: Kajian keratan rentas ini telah dijalankan di Kampus Kesihatan Universiti Sains Malaysia di Kelantan dalam kalangan pekerja lelaki yang berumur lebih daripada 20 tahun dan boleh membaca bahasa Malaysia. Mereka menerima soal selidik yang dicipta dan disahkan yang terdiri daripada ciri sosiodemografi, 32 item berkaitan pengetahuan, dan 16 item berkaitan sikap.

Keputusan: Peratusan pengetahuan yang baik ialah 61.9%. Hampir separuh daripada mereka sedar tentang tanda dan gejala kanser payudara. Kira-kira 40% mengetahui bahawa mamogram perlu dilakukan bermula pada usia 50 tahun pada wanita yang sihat dan tanpa sebarang risiko. Hanya 15.8% dan 21.3% lelaki sanggup berkahwin dengan wanita yang telah didiagnosis dengan kanser payudara dan yang telah menjalani

mastektomi. Walau bagaimanapun, majoriti (91.2%) menyatakan mereka akan menyokong isteri atau ibu mereka jika mereka disahkan menghidap kanser payudara. Mereka yang bekerja dalam pekerjaan klinikal, pendapatan keluarga yang lebih tinggi, mempunyai insurans kesihatan dan mengetahui dengan pasti tentang saringan mamogram isteri atau saudara mara rapat dapati signifikan dikaitkan dengan pengetahuan yang baik tentang kanser payudara. Menggunakan pekali korelasi Pearson, kami melihat sama ada kakitangan lelaki yang lebih berpengetahuan juga mempunyai sikap positif terhadap kanser payudara. Hubungan antara pengetahuan dan sikap ialah 0.27, iaitu signifikan secara statistik tetapi hanya positif lemah.

Kesimpulan: Penemuan menunjukkan bahawa usaha tambahan diperlukan untuk meningkatkan pengetahuan lelaki tentang kanser payudara, kerana lelaki mempunyai pengaruh yang signifikan terhadap kesihatan wanita. Walaupun terdapat korelasi lemah yang ketara antara pengetahuan dan sikap, ianya memberi kesan positif secara klinikal kepada komuniti kita.

ABSTRACT

Introduction: Breast cancer is the most prevalent cancer among Malaysian women. When first diagnosed, half of Malaysia's breast cancer patients were already at an advanced stage. One of contributing factor to the delay was a lack of knowledge and negative attitude about breast cancer. Even though breast cancer is more common in women than in men, men should still be sufficiently informed of it because it can affect how women decide to pursue their health. So, the primary goal of this study is to evaluate factors that are pertinent to men's awareness about women's breast cancer and attitudes toward breast cancer. Aside from that, we would like to investigate any links between men's knowledge and attitudes regarding women's breast cancer.

Methodology: This cross-sectional study was conducted at the Universiti Sains Malaysia Health Campus in Kelantan among male employees who are more than 20 years old and can read Malay. They received a validated newly developed questionnaire which consist sociodemographic characteristics, 32 knowledge-related items, and 16 attitude-related items.

Results: The prevalence of good knowledge was 61.9%. Almost half of them aware about signs and symptoms of breast cancer. About 40% known that mammogram should done starting at age 50 years old in women who is healthy and without any risk. Only 15.8% and 21.3% men willing to married women who has been diagnosed with breast cancer and who underwent mastectomy respectively. However, the majority (91.2%) stated they would support their wife or mother if they were diagnosed with breast cancer. Those working in clinical jobs, higher family income, have health insurance and know with certainty about their wife or 1st degree relatives previous mammogram screening were

significantly associated to good knowledge on breast cancer. Using Pearson's correlation coefficient, we looked at whether more knowledgeable male staff members also have positive attitudes toward breast cancer. The relationship between knowledge and attitudes is 0.27, which is statistically significant but only weakly positive.

Conclusion: The findings show that additional efforts are needed to increase men's knowledge about breast cancer, as men have a significant influence on women's health. Although there is a significant weak correlation between knowledge and attitude, clinically it has a positive impact on our community.

CHAPTER 1 INTRODUCTION

1.1 Study background

Cancer is one of the primary causes of morbidity and mortality worldwide. According to the International Agency for Research on Cancer (IARC), an estimated 18.1 million people were given a new cancer diagnosis in 2018. Lung cancer, colorectal cancer, and breast cancer were the three most common cancers that claimed the lives of women (WHO, 2018). In the meantime, 115,238 new cancer cases were diagnosed in Malaysia, according to the second five-year report of the Malaysia National Cancer Registry 2012-2016. While the number of female breast cancer cases reported in this second report (21,634) was greater than the number in the first report (18,206), breast cancer was the most prevalent cancer among Malaysian women between the ages of 25 and 75, making for 34% of all cancer cases. Additionally, Malaysian women had a 1 in 27 probability of developing breast cancer throughout their lifetime (MOH, 2019b).

There have been numerous efforts made by our government and non-governmental organizations (NGO) to lower the number of breast cancer patients and increase the incidence of early detection. One of these was the mammography-assisted breast cancer screening and education campaign for breast self-examination (Dahlui et al., 2011). Despite this measure, almost half of breast cancer patients in Malaysia when first diagnosed were already in the advanced stage (Hisham and Yip, 2004; MOH, 2019b). Delay in breast cancer presentation is defined as the total period from the first discovery of the symptoms to the beginning of the treatment for more than three months (Dahlui et al., 2011). As a matter of fact, those who presented earlier had higher rate of 5-year survival than those who presented late.

While several factors contributed to the delay in breast cancer presentation, one of the main causes were a lack of understanding and attitudes toward breast cancer (Hisham and Yip, 2004). A cross-sectional study conducted among women in Penang indicated that the cause for the delay in presentation was due to a lack of understanding about the symptoms and risk factors for breast cancer (Abdul Hadi et al., 2009). A survey of local women in Shah Alam found that they had an insufficient understanding about mammography and breast cancer signs and symptoms (Al-Dubai et al., 2011). Indeed, knowledge and attitude on sign and symptoms of breast cancer, breast self-examination and breast cancer screening program are all vitals for early detection.

The level of knowledge on breast cancer among men had been varied since different populations had different access to information and the instrument to measure the knowledge was unique to each research. One study in Saudi Arabia was conducted where the researchers included assessing knowledge about the breast cancer and its risk factor, mammography, and the awareness campaign in their standardized questionnaire (Farsi et al., 2020). From that survey, 85% of the male participant knew that early detection of breast cancer would eventually improve the treatment outcome. However, majority of men (60%) did not know that breast cancer can be inherited in their family lineage (Farsi et al., 2020).

Meanwhile, in the southwestern area of Saudi Arabia, another study had been conducted among 832 husbands (Al-Musa et al., 2019). Almost half of them were identified as having poor knowledge as they scored less than 8 out of 16 points during the survey. Majority of them did not know about the screening for breast cancer, either breast self-examination or mammography. Nevertheless, about 60% of them knew that breast

cancer can be inherited while more than two-thirds knew that breastfeeding is a protective factor for breast cancer. Researchers from the University Hospital of Marmara also had surveyed with similar interest by using their own standardized questionnaire. From that study, the mean score of breast cancer knowledge among men was 234.1 ± 128.0 (median: 227.5, min: 0, max: 571.0) (Ozaydin et al., 2020). It was less than half of the total score, 600. Although this study gave us some clues that the men's breast cancer knowledge was statistically not satisfying, researchers from America found that men still have a better understanding than their partner (Bolton et al., 2019).

Recent literature published in European Journal of Breast Health had found that about 55% of men will not marry women with breast cancer or had done mastectomy (Ozaydin et al., 2020). The authors had stated the participants also perceived that female breast as one of sexual organ which an important criterion in a marriage (Ozaydin et al., 2020). Nevertheless, 82 % of the respondents stated they will support their wives if the wives were diagnosed with breast cancer.

Several factors were found to be contributing to good knowledge on breast cancer in which there was a directly proportional relationship between age and level of knowledge on breast cancer (Bolton et al., 2019; Farsi et al., 2020; Ghazi et al., 2017). Vast studies depicted that education level had a significant association with the level of knowledge on breast cancer (Bolton et al., 2019; Farsi et al., 2020; Ozaydin et al., 2020). Marital status can also contribute to the increase in male education on female health (Bolton et al., 2019; Chamot and Perneger, 2002; Farsi et al., 2020). Monthly family income had also significant association with the level of knowledge on breast cancer (Bolton et al., 2019; Farsi et al., 2020; Ozaydin et al., 2020). Other than that, a group of

researcher from King Abdulaziz University found that those with family history breast cancer were more likely to have good knowledge of breast cancer than those who did not (Farsi et al., 2020). Previous study done in Abha show that wife practice in breast cancer screening was significantly related to men knowledge (Al-Musa et al., 2019).

1.2 Rationale of the study

Awareness is extremely important in combating breast cancer disease, as early detection and prompt treatment offer the greatest chance of long-term survival (Hisham and Yip, 2004; Moey et al., 2020). In general, a number of studies were carried out so far were to determine the awareness and attitudes towards breast cancer mostly concentrated on female respondents compared to male respondents. In Malaysia, data on knowledge about breast cancer among male population was minimal. A few years ago, a group of researchers from multiple private universities had discovered that the prevalence of poor knowledge about female breast cancer among male student was 54.8% (Ghazi et al., 2017).

Breast cancer among female in a way or another had been stigmatizing in certain countries. Not much research had done to study the men attitude towards breast cancer among female. Numerous studies have been conducted to ascertain people's attitudes and awareness about breast cancer, concentrating more on female respondents than male respondents. In matter of fact, the bulk of family concerns, including the decision to have certain spousal operations, were heavily influenced by male partners. Men who are very aware make women more likely to self-examine their breasts, which eventually increases the rate of early detection (Al-Musa et al., 2019). Women's autonomy to access health care services is hindered in some locations because to the patriarchal hierarchical system

(Ganle and Dery, 2015; Sayed et al., 2019). Therefore, it is essential to determine the level of knowledge among men to increase women's screening intake. Other than that, it is good for men to have knowledge regarding breast cancer as males are also at risk of getting breast cancer even though the risk is not as high as women of getting the disease. However, in this study we would only be focusing on women's breast cancer as men's breast cancer is the broad topic on its own.

Data on men's knowledge and attitudes concerning breast cancer and related factor, particularly among Malaysia's male populations, are scarce. Therefore, the main objective of this study was to evaluate factors that are pertinent to men's awareness of breast cancer and attitudes regarding breast cancer. Apart from that, we are interested to look for any correlation between men's knowledge and attitudes regarding breast cancer. We hope that the information in this study will help policymakers raise awareness and acceptance of breast cancer screening.

CHAPTER 2 OBJECTIVE OF STUDY

2.1 Research Questions

1. What is the level of knowledge towards women's breast cancer among male staffs in USM Health Campus?
2. How are attitudes towards women's breast cancer among male staffs in USM health campus
3. Are sociodemographic, socioeconomic factors and family history significant associated factors for knowledge on women's breast cancer among male staffs in USM Health Campus?

2.2 General Objective

To determine knowledge and attitudes towards women's breast cancer among male staffs of USM health campus.

2.3 Specific Objectives

1. To determine proportion of good knowledge towards women's breast cancer among male staffs of USM health campus
2. To describe attitudes towards women's breast cancer among male staffs of USM health campus
3. To identify the associated factor for good knowledge on women's breast cancer among male staffs of USM health campus
4. To determine the correlation between knowledge and attitude on women's breast cancer among male staffs of USM health campus

2.4 Research Hypothesis

Sociodemographic characteristics, socioeconomic status, occupation, family history of breast cancer, and wife breast cancer screening practice are significant

associated factors for knowledge on women's breast cancer among male staffs of USM Health Campus.

CHAPTER 3 MANUSCRIPT

3.1 THE MANUSCRIPT ACCORDING TO PEERJ JOURNAL FORMAT

Knowledge and Attitude Towards Women's Breast Cancer and Its Associated Factor Among Male Employees of Universiti Sains Malaysia Health Campus

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3.2 ABSTRACT

Background: Breast cancer was the most prevalent cancer among Malaysian women. Half of Malaysia's breast cancer patients were diagnosed at an advanced stage. Lack of knowledge and negative attitude contributed to the delay. Men should be adequately informed about breast cancer, even though it's more common among women because it can affect how women seek health care. **Methods:** A cross-sectional study was performed involving 360 male employees aged more than 20 working at the University Hospital. Simple random sampling generated by Microsoft excel was applied. A self-administered of validated Malay version questionnaires consisting of 32 knowledge-related items and 16 attitude-related items were distributed to the respondents. The score was converted into a percentage, and those who scored more than 50%, or 16 correct answers out of a total of 32, will be considered to have good knowledge. Descriptive statistic, simple and multiple logistic regression analyses were performed using SPSS version 26. **Result:** The proportion of respondents had good knowledge on breast cancer was 61.9%. Multiple logistic regression shows that those working in clinical setting [Adj. OR (95% CI): 4.3 (2.50,7.49); $p = <0.001$], higher family income [Adj. OR (95% CI): 2.2(1.16,4.20); $p = 0.016$, 6.4 (1.36,30.05); $p = 0.019$], having health insurance [Adj. OR (95% CI): 2.5 (1.38,4.50); $p = 0.002$] and awareness about wife's or first-degree relative's mammogram screening status [Adj. OR (95% CI): 2.7(1.23,5.97); $p = 0.013$]; were all significantly associated with good knowledge of breast cancer. The weak association between knowledge and attitude found in this study showed that the knowledge level is not influence the attitude towards breast cancer practice. **Conclusion:** Majority of men had good knowledge on breast cancer. working in clinical setting, higher family income, having health insurance and awareness about wife's or first-degree relative's mammogram screening status of were all significantly associated with good knowledge

of breast cancer. The findings suggest that different approaches are needed to raise men's knowledge of breast cancer, as they affect women's decision which have a substantial impact on women's health.

3.3 INTRODUCTION

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3.4 MATERIALS & METHODS

3.4.1 Study design and site

A cross-sectional study was done in university hospital in Malaysia for 24 months, from January 2021 until November 2022. The study was approved by the Research and Ethical Committee, School of Medical Sciences, in Malaysia (USM/JEPeM/21030265)

3.4.2 Sampling and study population

The sample size was determined using PS software version 3.1.6 by comparing two proportions for categorical variables, with the power of the study set at 80% and the type I error set at 5%. Based on a study by Farsi et al. (Farsi et al. 2020), the calculated sample size was 330 and considering the 10% non-response, the final sample size was 360.

This study included male staff in the hospital over the age of 20 and could read Malay selected randomly in University Hospital. The respondent were issued the "Respondent Information and Consent Form." They signed the permission form once they understood the study's purpose and agreed to participate. The questionnaire had to be completed in 20 to 30 minutes and was collected directly on the same day. All respondents are assured of the confidentiality of their data.

3.4.3 Study instrument

A sociodemographic characteristics questionnaire and a validated newly developed knowledge and attitudes questionnaire were distributed in this study. The knowledge section consists of 32 items on breast cancer which are further divided into five domains: a general understanding of breast cancer (6 items), breast cancer symptoms (7 items), breast cancer risk factors (10 items), breast cancer screening (7 items), and breast cancer treatment (2 items). The items were developed based on literature and discussion with

experts. Each correct answer was receive one point, while incorrect and do not know answers was receive zero points (MOH, 2019a). The score was converted into a percentage, and those who scored more than 50%, or 16 correct answers out of a total of 32, was considered to have good knowledge (Ghazi et al., 2017). While next part of the questionnaire consists of sixteen items on attitudes about breast cancer with a 5-point Likert scale with the following given response at each point; “Strongly disagree”, “disagree”, “neutral”, “agree”, and “strongly agree” with the scoring of 1 to 5. While for reverse statement as in items no 4, 9, 10, 11, 12, 13, and 15, scoring will be 5 to 1. The questionnaire was in Malay language.

Each knowledge and attitude item on the questionnaire's version was subjected to content and face validation. Each item's representativeness and relevance to a certain issue were established by the panel of experts who examined its content. Ten experts, consisting of one breast surgeon, one radiologist, and eight primary care physicians, were enlisted for content validation to assess for relevance of items. For ten experts, I-CVI and S-CVI/Avg, with a value of more than 0.78, were considered acceptable (Yusoff, 2019a). The calculated S-CVI/Avg was 0.98, thus, all items were included.

All items were then further proceeded with face validity, involving ten male health care workers involve various occupations, including medical practitioner, assistant medical officer, ambulance driver and health care assistant who will assess the clarity of items. The acceptable cut-off value for ten raters is more than 0.83 (Yusoff, 2019b). The calculated S-FVI/Avg was 0.98. Thus, no items were removed after face validation.

A pilot study was conducted to examine the reliability of the questionnaire. It was carried out on 50 male employees of School of Dental Science in the University Hospital. The Cronbach's alpha coefficients were 0.737 and 0.949 for attitudes and knowledge questions, respectively.

3.4.4 Statistical analysis

The data were analyzed using SPSS version 26. Descriptive analysis was done where numerical variables were presented as mean and standard deviation while categorical variables were presented by percentage and frequency. To identify statistically significant factors, the associated factors for good knowledge were analyzed using the simple logistic regression method. The multiple logistic regression was then run using factors with a *P*-value of less than 0.3 and variables that were clinically significant. Backward and forward stepwise procedures were used for variable selection until all important variables were included in the model. All possible two-way interactions and multicollinearity were checked before the preliminary model was finalized. Fitness of the model was tested by Hosmer and Lemeshow goodness of fit test, the classification table and receiver operating characteristics (ROC) curve. The Pearson correlation coefficient was used to determine the relationship between knowledge and attitudes.

3.5 RESULTS

There were a total of 360 respondents who participated in this study. The sociodemographic characteristics of the respondents are displayed in Table 1. The majority of respondents (46.9%) learn about breast cancer via their physicians, followed by friends and family (23.6%), the internet (12.8%), television (8.3%), newspapers (3.3%), and nurses (1.9 percent). Only a minority of respondents had never heard about breast cancer (3.1 %).

Table 1: Sociodemographic characteristics of respondents (n = 360)

Sociodemographic characteristics	Mean (SD)	n (%)
Age (years)	39.2 (9.33)	
Number of children	2.4 (1.84)	
Duration of working (years)	13.6 (8.88)	
Marital status		
Single		54 (15.0)
Married		306 (85.0)
Education level		
Primary and Secondary		59 (16.4)
Tertiary		301 (83.6)
Occupation		
Non-clinical		183 (49.2)
Clinical		177 (50.8)
Monthly family income		
< RM5000		215 (59.7)
RM5000-RM10 000		207 (29.7)
> RM10 000		38 (10.6)
Health insurance		
No		204 (56.7)
Yes		156 (43.3)
Presence of medical illness		
No		283 (78.6)
Yes		77 (21.4)
Previous health screening		
No		45 (20.2)
Yes		178 (79.8)
Family history of breast cancer		
No		321 (89.2)
Yes		39 (10.8)

Wife or 1 st degree relatives' previous mammogram	
Don't know	100 (27.8)
Not done	187 (51.9)
Done	73 (20.3)
Heard about breast cancer previously	
No	11 (3.1)
Yes	349 (96.9)

Note: SD = standard deviation

Details of the frequency and percentage of responses on knowledges and attitudes items are in Table 2 and 3. There were 223 respondents (61.9 %) that were considered as having good knowledge on breast cancer.

Table 2: Items on knowledge towards breast cancer among male staffs (n = 360)

General Understanding of Breast Cancer		Correct answer n (%)	Wrong answer n (%)	Don't know n (%)
1	Breast cancer is second most frequent cancer in women after cervical cancer.	49 (13.6)	237 (65.8)	74 (20.6)
2	In Malaysia there is increasing breast cancer cases which was diagnosed at late stage	238 (66.1)	62 (17.2)	60 (16.7)
3	Breast cancer is a disease specific to women	194 (53.9)	143 (39.7)	23 (6.4)
4	Breast cancer is a treatable disease	314 (87.2)	13 (3.6)	33 (9.2)
5	Breast cancer is an early detectable disease	307 (85.3)	19 (5.3)	34 (9.4)
6	Breast cancer is a genetic disease	178 (49.4)	74 (20.6)	108 (30.0)
Symptoms of Breast Cancer		Correct answer n (%)	Wrong answer n (%)	Don't know n (%)
7	A lump, lumpiness or thickening of breast	315 (87.5)	3 (0.8)	42 (11.7)
8	Change in shape or size of breast	276 (76.7)	17 (4.7)	67 (18.6)
9	Change in the nipple either the shape, crusting, a sore or un ulcer or redness	263 (73.1)	10 (2.8)	87 (24.2)
10	Nipple is turning in when it used to stick out	176 (48.9)	30 (8.3)	152 (42.2)
11	Change in the skin of the breast including dimpling, unusual redness or color changes	243 (67.5)	2 (0.6)	115 (31.9)
12	Unusual discharge from nipple without squeezing	237 (65.8)	9 (2.5)	114 (31.7)
13	Persistent pain that is unrelated to monthly menstrual cycle occurring in 1 breast only.	229 (63.6)	17 (4.7)	114 (31.7)

Risk Factors of Breast Cancer		Correct answer n (%)	Wrong answer n (%)	Don't know n (%)
14	Women who have had breast cancer are more likely to develop breast cancer at the other breast.	235 (65.3)	18 (5.0)	107 (29.7)
15	The risk is increased in women whose mother, or sister have breast cancer	228 (63.3)	41 (11.4)	91 (25.3)
16	Women who have the BRCA1 and BRCA2 genes are at increased risk of breast cancer.	149 (41.4)	14 (3.9)	197 (54.7)
17	Women whose menopause occurred after 50 years of age are at increased risk of breast cancer	125 (34.7)	71 (19.7)	164 (45.6)
18	Women whose first menstrual period occurred after age of 12 years old are at high risk of breast cancer	94 (26.1)	75 (20.8)	191 (53.1)
19	Women who delivered a first baby after 30 years of age are at increased risk of breast cancer	118 (32.8)	55 (15.3)	187 (52.0)
20	Multiparity women are at increased risk of breast cancer	140 (38.9)	60 (16.7)	160 (44.4)
21	Breastfeeding can reduce risk of getting breast cancer	235 (65.3)	23 (6.4)	102 (28.3)
22	The risk of breast cancer is increased in obese women	150 (41.7)	68 (18.9)	142 (39.4)
23	Women who on combination hormone replacement therapy has a mild risk for breast cancer	176 (48.9)	21 (5.8)	163 (45.3)
Breast Cancer Screening		Correct answer n (%)	Wrong answer n (%)	Don't know n (%)
24	Breast self-examination (BSE) is one of screening method for breast cancer	6 (1.7)	318 (88.3)	36 (10.0)
25	Breast self-examination should be performed starting from age 20 years old	260 (72.2)	20 (5.6)	80 (22.2)
26	Mammography is a radiological method used in breast imaging.	279 (77.5)	6 (1.7)	75 (20.8)
27	Mammography is one of screening method for breast cancer	275 (76.4)	9 (2.5)	76 (21.1)
28	Mammogram in completely healthy and without any risk women should be done starting at age 50years old	144 (40.0)	81 (22.5)	135 (37.5)
29	Mammogram is a main method for breast cancer screening for women age 40 and above	201 (55.8)	35 (9.7)	124 (34.4)
30	Women at age 75years old and more should continue with mammogram	76 (21.1)	117 (32.5)	167 (46.4)
Treatment of Breast Cancer		Correct answer n (%)	Wrong answer n (%)	Don't know n (%)
31	Treatment of breast cancer are surgery, radiotherapy, chemotherapy and hormonal therapy	316 (87.8)	2 (0.6)	42 (11.7)
32	All women with breast cancer need to do mastectomy for treatment.	141 (39.2)	129 (35.8)	90 (25.0)

Table 3: Items on attitudes towards breast cancer among male staffs (n = 360)

Attitudes towards breast cancer		Strongly disagree n (%)	Disagree n (%)	Unsure n (%)	Agree n (%)	Strongly agree n (%)
1	I will marry someone who has been diagnosed with breast cancer	48 (13.3)	79 (21.9)	176 (48.9)	48 (13.3)	9 (2.5)
2	I will marry someone who has had breast removal surgery (mastectomy)	47 (13.1)	66 (18.3)	170 (47.2)	61 (16.9)	16 (4.4)
3	I think a woman who has been diagnosed with breast cancer should not keep her illness a secret from others/her partner.	15 (4.2)	32 (8.9)	66 (18.3)	162 (45.0)	85 (23.6)
4	I will keep my wife's/mother's/partner's breast cancer diagnosis a secret from the people around me (family, friends etc) *	45 (12.5)	127 (35.3)	92 (25.6)	65 (18.1)	31 (8.6)
5	I will provide support if my wife/mother/partner is diagnosed with breast cancer	4 (1.1)	3 (0.8)	25 (6.9)	146 (40.6)	182 (50.6)
6	I will help ease the housework of my mother/wife/partner if they have breast cancer	4 (1.1)	4 (1.1)	22 (6.1)	149 (41.4)	181 (50.3)
7	I will provide support if the mother/wife/partner needs to undergo breast removal surgery (mastectomy).	4 (1.1)	4 (1.1)	21 (5.8)	167 (46.4)	164 (45.6)
8	I will provide support if my wife/mother/partner wants to have breast reconstruction surgery	5 (1.4)	8 (2.2)	54 (15.0)	146 (40.6)	147 (40.8)
9	I will try to get traditional treatment first if my wife/partner/close relative gets breast cancer *	96 (26.7)	95 (26.4)	85 (23.6)	55 (15.3)	29 (8.1)
10	I feel it is appropriate for me to divorce my wife/partner if she is diagnosed with breast cancer*	200 (55.6)	92 (25.6)	50 (13.9)	11 (3.1)	7 (1.9)
11	I think it is not wrong for me to marry someone else if my wife/partner has breast cancer *	104 (28.9)	68 (18.9)	132 (36.7)	37 (10.3)	19 (5.3)
12	I will have sexual dysfunction if my wife has breast cancer *	67 (18.6)	82 (23.1)	157 (43.6)	43 (11.9)	10 (2.8)
13	I feel women who have had a mastectomy will lose their sexual attraction *	75 (20.8)	76 (21.1)	157 (43.6)	41 (11.4)	11 (3.1)
14	I will help take on the task if a colleague has breast cancer	9 (2.5)	21 (5.8)	86 (23.9)	187 (51.9)	57 (15.8)

15	I felt uncomfortable working with a colleague who had breast cancer *	151 (41.9)	147 (40.8)	45 (12.5)	10 (2.8)	7 (1.9)
16	I will provide moral support if a colleague has breast cancer	11 (3.1)	5 (1.4)	27 (7.5)	147 (40.8)	170 (47.2)

* Reverse statement

In simple logistic regression, 11 variables showed a p -value of less than 0.3 and were included in the multiple logistic regression analysis (Table 4). Multiple logistic regression (Table 5) showed that those working in clinical jobs are 4.3 times (95% CI: 2.50 – 7.49, $p < 0.001$) more likely to have good knowledge than non-clinical jobs. Those that earn between RM 5,000 to RM 10,000 and more than RM 10,000 are 2.2 times (95% CI: 1.16 – 4.20, $p = 0.016$) and 6.4 times (95% CI: 1.36 – 30.05, $p = 0.019$) more likely to have good knowledge on breast cancer, respectively than those earning less than RM 5,000. Those with health insurance are 2.5 times (95% CI: 1.38 – 4.50, $p = 0.002$) more likely to have good knowledge on breast cancer than those without health insurance. Those that know with certainty whether their wife or 1st-degree relatives have not or have done mammograms reported 2.7 times (95% CI: 1.23 – 5.97, $p = 0.013$) and 2.1 times (95% CI: 1.16 – 3.83, $p = 0.014$) more likely to have good knowledge on breast cancer, respectively, than those that are not sure. The model was able to predict accurately that 73.3% of respondents had a good level of knowledge.

Table 4: Associated factors for good knowledge of breast cancer among male staff by simple logistic regression analysis

Variables	Good knowledge (n=223) n (%)	Poor knowledge (n=137) n (%)	Crude Odd Ratio (95% CI)	Wald statistics	P value
Age (years)	38.3(9.10)*	40.7(9.53)*	0.97 (0.95, 0.995)	5.847	0.016
No of children	2.2(1.82)*	2.7(1.86)*	0.87 (0.78, 0.98)	5.158	0.023
Duration of working (years)	12.8(8.41)*	14.9(9.49)*	0.97 (0.95, 0.998)	4.544	0.033
Marital status					
Single	37 (16.6)	17 (12.4)	1	-	-
Married	186 (83.4)	120 (87.6)	0.72 (0.38,1.32)	1.157	0.282

Education level					
Secondary	20 (9.0)	39 (28.5)	1	-	-
Tertiary	203 (91.0)	98 (71.5)	4.04 (2.24, 7.29)	21.472	<0.001
Occupation					
Non-clinical	75 (33.6)	108 (78.8)	1	-	-
Clinical	148 (66.4)	29 (21.2)	7.35 (4.48, 12.06)	62.324	<0.001
Monthly family income					
<RM5000	100 (44.8)	115 (83.9)	1	-	-
RM5000-RM10 000	87 (39.0)	20 (14.6)	5.00 (2.87, 8.71)	32.322	<0.001
>RM10 000	36 (16.2)	2 (1.5)	20.70 (4.86, 88.15)	16.802	<0.001
Health insurance					
No	94 (42.2)	110 (80.3)	1	-	-
Yes	129 (57.8)	27 (19.7)	5.59 (3.39, 9.19)	45.916	<0.001
Presence of medical illness					
No	178 (79.8)	105 (76.6)	1	-	-
Yes	45 (20.2)	32 (23.4)	0.83 (0.49, 1.39)	0.509	0.476
Previous health screening					
No	45 (20.2)	59 (43.1)	1	-	-
Yes	178 (79.8)	78 (56.9)	2.99 (1.87, 4.79)	20.849	<0.001
Family history of breast cancer					
No	200 (89.7)	121 (88.3)	1	-	-
Yes	23 (10.3)	16 (11.7)	0.87 (0.44, 1.71)	0.163	0.686
Wife or 1 st degree relatives' previous mammogram					
Don't know	46 (20.6)	54 (39.4)	1	-	-
Not done	121 (54.3)	66 (48.2)	2.15 (1.31, 3.54)	9.227	0.002
Done	56 (25.1)	17 (12.4)	3.87 (1.98, 7.56)	15.642	<0.001
Heard about breast cancer previously					
No	4 (1.8)	7 (5.1)	1	-	-
Yes	219 (98.2)	130 (94.9)	2.95 (0.85, 10.26)	2.885	0.089

*Mean (SD)

Table 5: Associated factor for good knowledge on breast cancer among male staffs by multiple logistic regression analysis

Variables	Regression coefficient	Adjusted OR (95% CI)	<i>p</i>
Occupation			
Non-clinical	-	1	
Clinical	1.46	4.3 (2.50, 7.49)	< .001
Monthly income			
<RM5,000	-	1	
RM5,000 – RM 10,000	.79	2.2 (1.16, 4.20)	.016
> RM 10,000	1.86	6.4 (1.36, 30.05)	.019
Health insurance			
No	-	1	
Yes	0.91	2.5 (1.38, 4.50)	.002

Wife or 1 st degree relatives' previous mammogram			
Don't know	-	1	
Not done	.99	2.7 (1.23, 5.97)	.013
Done	.75	2.1 (1.16, 3.83)	.014
Forward LR method was applied			
No multicollinearity and no interaction			
Hosmer-Lemeshow test p-value 0.11			
Classification overall percentage was 73.3%			
Area under Receiver Operating Characteristics (ROC) curve was 70%			

The mean (SD) scores for attitude toward breast cancer were 60.2 (7.85), whereas the mean (SD) for knowledge scores was 17.6 (7.57). There was a significant correlation ($p < 0.001$) between knowledge and attitude toward breast cancer. The observed Pearson's correlation was 0.27 suggesting a weak correlation.

3.6 DISCUSSION

Men's knowledge and attitudes play an important role in early detection of breast cancer among their spouses or relatives. However, studies on men's knowledge and attitudes towards breast cancer are limited. Result of our study shows 61.9% of the male employees at the University Hospital had good knowledge. The findings is slightly higher compared to a previous study done among male student of local private university, which found only 45.2% had good knowledge (Ghazi et al., 2017). Male students' lack of awareness is due to their youth and lack of exposure to breast cancer. Researchers from the University Hospital of Marmara, Turkey also surveyed with a similar interest among husbands attending their hospital. According to the study, the mean score for men's breast cancer knowledge was 234 ± 1128.0 , which was less than half of the overall score of 600 (Ozaydin et al., 2020). Another study done among men visiting primary healthcare clinics in Saudi Arabia also found that slightly more than half have good knowledge, with a prevalence of 53.6% (Al-Musa et al., 2019). While a study done in Kashmir have much lower prevalence as they reported only 3.5% have good awareness (Ahmad Salati et al.,