BREAST CANCER AWARENESS AND FACTORS ASSOCIATED WITH BREAST SCREENING UPTAKE AMONG WOMEN IN KELANTAN

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by

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF SYMBOLS

>	More than
<	Less than
≥	Greater than or equal to
≤	Less than or equal to
=	Equal to
%	Percentage
α	Alpha

LIST OF ABBREVIATIONS

AOR	Adjusted odds ratio
ASR	Age Standardized Rate
BCAM-M	Breast Cancer Awareness Measure Malaysia
BMI	Body Mass Index
BSE	Breast self-examination
CBE	Clinical breast examination
CI	Confidence Interval
DOSM	Department of Statistics Malaysia
GLOBOCAN	Global Cancer Observatory
HRT	Hormone Replace Therapy
LR	Logistic regression
MOH	Ministry of Health Malaysia
NIH	National Institute of Health
NCI	National Cancer Institute
NHMS	National Health and Morbidity Survey
OCP	Oral contraceptive pill
OR	Odds ratio
PR	Prevalence ratio
RR	Relative risk
SD	Standard deviation
SPSS	Statistical Package for the Social Sciences
USM	Universiti Sains Malaysia
WHO	World Health Organization

LIST OF APPENDICES

KESEDARAN KANSER PAYUDARA DAN FAKTOR-FAKTOR YANG MEMPENGARUHI PENYERTAAN SARINGAN KANSER PAYUDARA DALAM KALANGAN WANITA DI KELANTAN

ABSTRAK

Pendahuluan: Kanser payudara kekal sebagai cabaran kesihatan awam yang utama, baik di peringkat global dan juga di Malaysia. Pengesanan lewat mengakibatkan kadar kelangsungan hidup yang lebih rendah dan kematian yang lebih tinggi kerana kanser didiagnosis pada tahap yang lebih lanjut. Pengesanan awal melalui kaedah saringan adalah penting untuk meningkatkan kadar kelangsungan hidup pesakit kanser payudara. Walaupun begitu, kadar penyertaan saringan kanser payudara di Kelantan masih rendah.

Objektif: Kajian ini bertujuan untuk mengkaji kesedaran kanser payudara, halangan-halangan dalam mendapatkan perkhidmatan kesihatan, dan faktor-faktor yang mempengaruhi penyertaan saringan kanser payudara dalam kalangan wanita di Kelantan.

Metodologi: Kajian keratan rentas ini dijalankan dengan persampelan mudah melibatkan 242 wanita di Kelantan dari November 2023 hingga Jun 2024. Kajian ini menggunakan borang soal selidik Breast Cancer Measurement Tool Malaysia (BCAM-M) mengandungi 60 item yang terbahagi kepada enam domain: sosiodemografi, kesedaran tanda-tanda dan gejala kanser payudara, kesedaran faktor risiko, halangan dalam mendapatkan perkhidmatan kesihatan, amalan pemeriksaan sendiri payudara (PSP) dan penyertaan saringan kanser payudara. Dalam kajian ini,

penyertaan saringan payudara adalah merujuk kepada peserta yang pernah menjalani pemeriksaan payudara klinikal (PKP). Analisa deskriptif dan regresi logistik telah dijalankan untuk mengenalpasti faktor-faktor yang mempengaruhi penyertaan saringan payudara di kalangan wanita di Kelantan.

Keputusan: Daripada 242 peserta, keputusan menunjukkan bahawa 59.5% (95% CI 53.28, 65.73) peserta mempunyai kesedaran tentang tanda dan gejala kanser payudara, 17.4% (95% CI 12.55, 22.16) mempunyai kesedaran tentang risiko berkaitan usia dan 22.7% (95% CI 17.41, 28.04) mempunyai kesedaran tentang faktor risiko kanser payudara. Seramai 10.3% peserta mengakui mempunyai halangan dalam mendapatkan perkhidmatan kesihatan, manakala 80.2% dari jumlah peserta tinggal dalam jarak lima kilometer dari kemudahan kesihatan. Selain itu, 40.5% (95% CI 46.0,51.0) mengamalkan pemeriksaan sendiri payudara (PSP) secara berkala, 60.3% (95% CI 54.12, 66.54) telah menjalani pemeriksan klinikal payudara (PKP), dan 25.9% (95% CI 17.79, 34.01) wanita berumur 40 tahun ke atas telah menjalani mamogram. Faktor-faktor yang mempengaruhi secara signifikan penyertaan saringan payudara ialah berkahwin (AOR 4.78; 95% CI 2.20, 10.40), bercerai (AOR 4.99; 95% CI 1.35, 18.50), tingkah laku mendapatkan penjagaan kesihatan dengan segera (AOR 3.68; 95% CI 1.98, 6.85), kesedaran tentang PKP (AOR 7.41; 95% CI 2.55, 21.54), dan tinggal dalam jarak lima kilometer dari fasiliti kesihatan (AOR 2.39; 95% CI 1.17, 4.89).

Kesimpulan: Dapatan kajian ini dapat membantu sektor kesihatan merangka intervensi yang khusus untuk kumpulan-kumpulan tertentu yang dikenal pasti bagi meningkatkan kesedaran tentang kanser payudara dan penyertaan saringan. Pelaksanaan strategi yang

bersasar ini boleh meningkatkan pengesanan awal, kadar kelangsungan hidup yang lebih baik, dan mengurangkan kadar kematian akibat kanser payudara.

KATA KUNCI: Kanser payudara, Kesedaran, Saringan Kanser Payudara, Pemeriksaan Sendiri Payudara, Pemeriksaan Payudara Klinikal, Malaysia

BREAST CANCER AWARENESS AND FACTORS ASSOCIATED WITH BREAST SCREENING UPTAKE AMONG WOMEN IN KELANTAN.

ABSTRACT

Background: Breast cancer remains a significant public health challenge, both globally and in Malaysia. Late presentation of breast cancer often results in lower survival rates and higher mortality due to the advanced stage of the disease at diagnosis. Early detection through screening methods is crucial for improving survival rates. Despite this, the breast screening uptake in Kelantan remains low.

Objective: To investigate breast cancer awareness, perceived barriers to healthcare-seeking, breast screening uptake and factors associated with breast screening uptake among women in Kelantan.

Methods: A cross-sectional study was conducted using convenience sampling to select 242 women in Kelantan between November 2023 and June 2024. The Breast Cancer Awareness Measure Malaysia (BCAM-M) questionnaire, which consists of 60 items across six domains: sociodemographic, awareness of breast cancer signs and symptoms, awareness of risk factors, barriers to healthcare-seeking, breast self-examination practices, and breast screening uptake, was used for data collection. This study defined breast screening uptake as having ever undergone a clinical breast examination (CBE). Descriptive statistics and logistic regression analyses were performed to identify the factors associated with breast screening uptake.

Results: Of 242 participants, 59.5% (95% CI 53.28, 65.73) were aware of breast cancer signs and symptoms, 17.4% (95% CI 12.55, 22.16) were aware of age-related risks, and 22.7% (95% CI 17.41, 28.04) were aware of breast cancer risk factors. Perceived

barriers to healthcare-seeking were reported by 10.3% of participants, and 80.2% resided within five kilometres of a healthcare facility. Additionally, 40.5% (95% CI 46.0, 51.0) practised BSE regularly, 60.3% (95% CI 54.12, 66.54) had undergone a CBE, and 25.9% (95% CI 17.79, 34.01) of women aged 40 years and above had undergone a mammogram. Factors significantly associated with breast screening uptake were being married (AOR 4.78; 95% CI 2.20, 10.40), being divorced (AOR 4.99; 95% CI 1.35, 18.50), healthcare-seeking within two months (AOR 3.68; 95% CI 1.98, 6.85), ever heard of CBE (AOR 7.41; 95% CI: 2.55, 21.54), and residing within five kilometres of a healthcare facility (AOR 2.39; 95% CI 1.17, 4.89).

Conclusion: The findings help health sectors design tailored interventions for specific identified groups to increase breast cancer awareness and screening uptake. Implementing these targeted strategies could enhance early detection, higher survival rates, and reduce breast cancer mortality.

KEYWORDS: Breast cancer, Awareness, Breast screening, Uptake, Self-breast examination, Clinical breast examination, Mammogram, Malaysia.

CHAPTER 1

INTRODUCTION

1.1 Breast Cancer

Breast cancer is a pathological condition caused by the unregulated proliferation of anomalous cells inside the breast tissue. These cells typically cluster to form a tumour, which may be detectable on an X-ray or as a lump. While breast cancer predominantly affects women, it can also occur among men, albeit less frequently. Breast cancer can start from different parts of the breast. It can originate from any of the three primary anatomical structures of the breast: the ducts, lobules or surrounding connective tissue. The majority of breast cancers begin in the ducts that transport milk to the nipple, known as ductal cancers. Others start in the lobules, the glands that produce breast milk, termed lobular cancers. Other types of breast cancer are less common (Waks and Winer, 2019). The earliest form (in situ) of breast cancer is not life-threatening and can be detected in early stages. The repercussions of delayed diagnosis and untreated cases can be dire, potentially leading to metastasis and, ultimately, mortality.

Breast cancer represents a significant global public health challenge. It is the second most prevalent cancer in the world, comprising a substantial portion of the 19.6 million new cancer cases reported in 2020, accounting for 11.7% of diagnoses. Among women, breast cancer represents one in every four cancer diagnoses. It is the most commonly diagnosed cancer in 159 out of 185 countries worldwide. The incidence rates are significantly higher in the countries that have transitioned, with a rate of 55.9-29.7 per 100,000. The regions with the highest incidence rates are Australia/New Zealand, Western Europe, Northern America, and Northern Europe, with a rate of 80 Per 100,000. On the other hand, the regions with the lowest incidence rates are Central

America, Eastern and Middle Africa, and South-Central Asia, with less than 40 per 100,000 (Sung *et al.*, 2021).

In Malaysia, breast cancer is the most commonly diagnosed cancer among women, making up 34.1% of all female malignancies. In Kelantan, it is also a significant issue, accounting for 14.4% of all cancers affecting women. Malaysia had an Age Standardized Rate (ASR) of 34.1 per 100,000 population, whereas Kelantan demonstrated a rate of 22.4 per 100,000 individuals. The ASR had a notable upward trend in Malaysia and Kelantan, with increases of 9.6% and 31.8%, respectively. In Malaysia, the incidence of breast cancer began to rise from the age of 25 and reached its peak between the ages of 60-64, after which it decreased. The highest incidence rates were observed among Chinese individuals, with 40.7 cases per 100,000 people, followed by Indians with 38.1 per 100,000 and Malays with 31.5 per 100,000 (MOH, 2019b).

Breast cancer is the fifth leading cause of cancer-related deaths worldwide, accounting for 6.9% of the 9.96 million lives lost to cancer annually. In Malaysia, it ranks among the top 10 causes of death, responsible for 1.5% of total deaths in 2022 (DOSM, 2023). About 52.1% of breast cancer cases in Malaysia are diagnosed at the early stages (stage I and II), which boast relative survival rates above 80% up to 10 years for stage I and up to 5 years for stage II. However, the percentage of late-stage diagnoses (stage III and IV) has risen from 43.2% in 2007-2011 to 47.9% in 2012-2016, significantly decreasing survival rates for these stages (MOH, 2019b).

Breast cancer screening is a vital component in the fight against breast cancer, playing a crucial role in early detection and diagnosis of the disease. Breast self-examination (BSE), clinical breast examination (CBE), and mammogram screening

are several methods suggested for early detection of breast cancer. BSE is a self-conducted method where women check their own breasts for lumps, changes, or abnormalities. This practice helps women become familiar with the normal look and feel of their breasts, making it easier to notice any unusual changes that should be reported to a healthcare provider.

Currently, breast cancer screening in Malaysia comprises mammograms and CBE. A Mammogram is an X-ray of the breast that can detect tumours that are too small to be felt. Women aged 40 and above with risk factors are recommended to undergo mammograms every year. For women aged 50-74, mammography may be performed every two years (MOH, 2019a). Meanwhile, CBE involves a physical examination of the breast performed by a healthcare professional. CBE is recommended to be done every three years for women aged 20-39 and annually for women aged 40 (MOH, 2021). CBE is offered at the government healthcare facility, whereas the mammogram is available at each main state hospital and tertiary hospital under the Ministry of Education.

Early detection and diagnosis are crucial in reducing morbidity and improving survival rates for breast cancer (Beatrice *et al.*, 2015). The earlier breast cancer is detected, the more treatment options are available, enhancing the chances of successful treatment. Research conducted in Ireland demonstrated that breast cancer screening significantly influenced the mode of presentation of the disease. Screening led to an increase in early-stage diagnosis and a decrease in late-stage incidence within the patient cohort, culminating in a 29.9% reduction in breast cancer case fatality in the intervention group compared to the control group (Moran and Cullinan, 2022). This aligns with the findings from a study in Spain, where patients referred through the

breast screening program exhibited earlier-stage cancer presentation. Consequently, these patients required less radical surgery and adjuvant chemotherapy (Lete *et al.*, 2018).

Therefore, optimising breast screening uptake is a crucial strategy in reducing the morbidity and mortality associated with breast cancer. Investigating the factors influencing breast screening uptake and identifying facilitators and barriers is essential. This understanding would enable the development of targeted interventions to enhance screening programs, ultimately improving early detection and treatment outcomes for breast cancer.

1.1.1 Breast cancer awareness

~~1.1.1 Breast cancer awareness~~

Breast cancer awareness is an essential component in the fight against breast cancer. This awareness initiative aims to educate the public about the disease by highlighting its symptoms, outlining risk factors, and underscoring the critical importance of early detection through regular screenings. The primary goal of these initiatives is to decrease breast cancer mortality by encouraging screening participation and enhancing early detection and effective treatment.

Several studies on breast cancer awareness conducted in Malaysia showed varied awareness levels, from moderate levels towards risk factors to high awareness of the screening methods (Norsa'adah *et al.*, 2022). Evidence supporting the association of breast cancer awareness towards breast screening uptake has been reported in various studies (Aishath *et al.*, 2021; Ngan *et al.*, 2022). The significance of breast cancer awareness extends beyond simple education. It fosters a comprehensive understanding of the symptoms and risk factors associated with breast

cancer, empowering women to seek medical intervention promptly. Studies have consistently shown that when breast cancer is detected early, treatment is more likely to be successful, leading to higher survival rates (Birnbaum *et al*., 2018).

In Malaysia, the Ministry of Health has actively promoted various breast cancer awareness programs through multiple mediums and in collaboration with numerous governmental and non-governmental organisations (NGOs). These initiatives aim to enhance health-seeking behaviour by increasing awareness and knowledge among the ~~general public~~public and healthcare providers. Promotional activities focusing on prevention, modifiable risk factors, signs and symptoms of breast cancer, and the importance of screening have been disseminated via conventional media, including television and radio channels. New media platforms such as the Ministry of Health's website, the MySejahtera application, and social media channels like Facebook, Instagram, and Twitter have been utilised to broaden the outreach. Specifically, every year during Breast Cancer Awareness Month in October, also known as Pinktober, there is an intensified promotion with various awareness activities to increase breast cancer awareness among the population (MOH, 2021).

Despite numerous initiatives, the overall level of breast cancer awareness in Malaysia remains unsatisfactory. A study conducted in Selangor revealed that only 36.6% of the respondents had good awareness of breast cancer, while 63.4% demonstrated poor awareness (Hasanain *et al*., 2020). Similarly, a study in the southern region of Peninsular Malaysia indicated a concerning level of knowledge about breast cancer. Specifically, 53.7% of participants had poor knowledge of breast cancer warning signs, 50.7% had inadequate knowledge of BSE techniques, and 55.6% were unaware of breast cancer risk factors (Yee and Yusuf, 2022).

1.1.2 Barriers to healthcare-seeking

One out of four Malaysians would delay medical attention for suspected cancer symptoms, and women experienced more barriers to healthcare-seeking compared to men (Su *et al.*, 2020). Barriers to healthcare seeking can be defined as obstacles or challenges that hinder individuals from accessing or utilising healthcare services when needed. These barriers can arise from various factors such as financial constraints, geographical distance to healthcare facilities, lack of health insurance, cultural or language barriers, long waiting times, lack of information, stigma, discrimination, and inadequate healthcare infrastructure (Levesque *et al.*, 2013). These barriers can prevent individuals from seeking timely and appropriate healthcare, leading to diagnosis and treatment delays and poorer health outcomes.

Barriers to healthcare-seeking for breast cancer patients will affect patients severely and could cost their lives. One of the most critical impacts of barriers to healthcare-seeking is the late-stage presentation to healthcare. Studies indicate that a significant proportion of women present with advanced stage of breast cancer due to delays in seeking medical attention. For example, from a study in Indonesia, almost half (43.3%) of the breast cancer patients in the setting experienced a delay in presentation, and (64.7%) had a diagnosis confirmation after more than one month. These delays are often attributed to a lack of awareness about breast cancer symptoms (41.5%), low perceived severity (27.7%) and fear of surgery intervention (26.2%) (Hutajulu *et al.*, 2022). Similarly, in South Africa, almost a third of the patients (30.4%) presented at a late stage, with the factors associated with the delay being difficulties with transport, low level of education and fear of missing appointments due to work (Rayne *et al.*, 2019). Another study done in Pakistan also revealed that a

significant proportion of breast cancer patients (88,8%) presented late to healthcare services due to multiple barriers (Gulzar *et al.*, 2019).

Addressing barriers to healthcare-seeking for breast cancer is crucial, as these obstacles contribute significantly to delayed diagnosis and treatment. Identifying these barriers is essential, as they can vary considerably by location and cultural context, necessitating tailored solutions. Cultural sensitivities, financial constraints, logistical challenges, and psychological factors affect healthcare access. Understanding and mitigating these diverse barriers through targeted interventions can improve early detection and treatment outcomes, ultimately reducing breast cancer morbidity and mortality. Several studies showed that tailored intervention addressing barriers through implementing a patient navigation program improves access to quality breast health services for needy women (Molina *et al.*, 2018; Perez-Bustos *et al.*, 2022).

1.1.3 Breast cancer screening

Breast cancer screening primarily serves as a secondary prevention measure. It is a critical public health strategy designed to detect breast cancer at an early stage before symptoms appear. Regular screening can lead to early detection of tumours, significantly impacting survival rates by allowing timely and less invasive treatment options. Early detection of breast cancer leads to an almost complete cure, and with timely diagnosis and effective treatment, the 5-year survival rate can increase to 90% (Abdullah *et al.*, 2022). Early detection tools include BSE, CBE, and mammogram.

1.1.3(a) Breast self-examination (BSE)

BSE is a method where individuals visually and physically check their breasts to identify any persistent changes or anomalies. This personal assessment helps individuals recognise their normal breast conditions over time. During a BSE, a person

examines their breasts in a mirror to look for differences in symmetry, skin puckering, dimpling, or other changes. They also feel their breasts and armpits with extended arms and shoulders to spread the breast tissue evenly on the chest wall. BSE is a preventive health measure. Regularly conducting BSE can enhance women's awareness of the typical state of their breasts and increase their likelihood of detecting any alterations. While BSE does not serve as a replacement for breast screening methods such as CBE or mammography, it enables women to take an active role in their own healthcare. It promotes personal control over one's body and accountability, which might motivate women to take additional steps, such as seeking medical advice if they see anything abnormal. For example, in regions like northern Peru, where routine screening may not be typical, over 90% of breast cancer cases are detected by the individuals themselves (Romanoff *et al.*, 2017). Thus, BSE is an essential practice for health empowerment and should be actively encouraged.

1.1.3(b) Clinical breast examination (CBE)

A CBE is a physical examination conducted by healthcare professionals. It includes thoroughly assessing the breasts, nipples, and areolas and the axillary, infraclavicular, and supraclavicular lymph nodes. Further diagnostic imaging and possibly a tissue biopsy may be required for a definitive diagnosis if any abnormalities are detected during a CBE. It is recommended that women aged 20 to 39 undergo a CBE every three years, while women aged 40 and older should have the examination annually (MOH, 2021). Several studies have demonstrated the effectiveness of CBE in early breast cancer detection (Ngan *et al.*, 2020; Turan *et al.*, 2021). According to Ngan *et al.* (2023), although CBE appears to have lower sensitivity than mammography, it may have a similar effect on mortality reduction. CBE has been proven to lead to favourable stage shifting, and in another separate study, CBE

indicates a survival advantage for women aged 50 and older when CBE is utilised (Mittra *et al.*, 2021).

1.1.3(c) Mammogram

A mammogram is an X-ray examination of the breast, including multiple views of one or both breasts. Mammogram utilises a low level of X-rays to generate breast images, which are subsequently examined by a radiologist to detect indications of cancer. It is used to screen breast disease in women who have breast symptoms, such as a lump, pain, or nipple discharge, and in women with no breast complaints. In Malaysia, women aged 40 years and above with risk factors are recommended to undergo mammogram every year. Meanwhile, for women aged 50 to 74 years (average risk), mammography may be performed every two years. For high-risk women, screening mammography should be offered from 30-49 years of age, annual mammography from 40-69 and 3 yearly mammography from 70 onwards (MOH, 2019a).

Mammogram screening is considered the gold standard for early detection of breast cancer in well-resourced settings. A study in Taiwan showed that mammographic screening of women increased the 10-year survival rate from 89.68% to 97.33% (Yao *et al.*, 2023). Another study by Lim *et al.* (2022) demonstrated that mammography screening is highly effective in improving breast cancer outcomes. Patients who underwent regular mammography screening were diagnosed with more favourable tumour characteristics, such as earlier stage, lower grade, smaller size, and HER2-negative status. Additionally, these patients had significantly better overall survival rates compared to those who did not attend screening or were unaware of mammography. Mammographic screening programs demand significant resources for both their initiation and ongoing maintenance. In addition to acquiring mammogram

machines, these programs necessitate a skilled workforce, systems for quality control, and efficient data management systems to monitor patients across multiple studies over time.

1.2 Problem statement

According to Global Cancer Observatory (GLOBOCAN) in 2018, the cancer incidence in Malaysia is expected to double by 2040 (43,837 to 74,158 cases). Breast cancer is the most common cancer of all genders in Malaysia, accounting for 19.1% of all total cancer reported in 2012-2016. Additionally, there has been an upward trend in the number of breast cancer patients presenting at a late stage, rising from 43.3% in 2007-2011 to 47.9% in 2012-2016 (MOH, 2019b). Despite breast cancer being curable if detected early, Malaysia reports a disappointing 5-year survival rate of 66.8% lower than Asian countries like Japan (88.9%) and Korea (84.0%) (MOH, 2018).

Early detection and screening are crucial for addressing this issue. However, the participation rate for CBE in Malaysia remains below the target. Between 2016 and 2020, the uptake of CBE among women ranged from 25.0% to 29.2%, with an average of 26.6% (Said and Sutan, 2021). This low participation rate highlights a significant gap in preventive measures and underscores the need for further research to identify and address the factors associated with breast cancer screening.

The other critical factor influencing the low uptake of CBE is the presence of barriers to healthcare-seeking behaviour. These barriers include emotional barriers, health system-related, sociocultural stigmas, financial constraints, and screening-related (Mohan *et al.*, 2021). Understanding and addressing these barriers is essential because they significantly impact the likelihood of women participating in preventive health measures such as CBE (Ponce-Chazarri *et al.*, 2023).

Despite the urgency, there is a lack of research exploring the level of awareness, barriers to healthcare-seeking, and their relationship with CBE participation, especially in the Malaysian context.

1.3 Rationale of study

The findings of this study will provide healthcare professionals and policymakers with valuable insight to re-strategize better interventions to meet the needs of the target population. Consequently, increasing the uptake of CBE could lead to earlier detection, diagnosis, and treatment of breast cancer, reducing the incidence of late-stage presentation. This improvement in early intervention can enhance survival rates and ultimately decrease mortality among breast cancer patients. It later will help to reduce the financial and emotional burden that affects cancer patient's quality of life following diagnosis and treatment. In Malaysia, about 45% of cancer survivors spend over a third of their household income on cancer care within the first years of diagnosis. This financial burden may extend to many more years after diagnosis due to ongoing cancer treatment and care for late effects treatment.

The outcomes of this study would further help to achieve the Ministry of Health Malaysia's National for Cancer Control Programme 2021-2025 target and Sustainable Development Goal Indicator 3.4.1:

i) To Downstage breast cancer at the time of diagnosis by 25% by the year 2030.

ii) To improve breast cancer's 5-year relative survival rate by 2030.

iii) To reduce the risk of premature mortality rate caused by cancer by one-third by 2030.

1.4 Research questions

1) Are women in Kelantan aware of breast cancer signs, symptoms, and risk factors?
2) What are the barriers to healthcare-seeking related to breast cancer?
3) What are the factors associated with CBE uptake among women in Kelantan?

1.5 Research objectives

1.5.1 General objective

To study breast cancer awareness and factors associated with breast screening uptake among women in Kelantan.

1.5.2 Specific objective

1) To describe the awareness of breast cancer signs and symptoms and risk factors among women in Kelantan.

2) To describe the perceived barriers to healthcare-seeking for breast cancer screening among women in Kelantan.

3) To describe the breast cancer screening uptake among women in Kelantan.

4) To determine factors associated with clinical breast examination uptake among women in Kelantan.

1.6 Research hypotheses

There are significant factors (sociodemographic factors, awareness of breast cancer, barriers to healthcare seeking, healthcare accessibility and BSE practice) associated with clinical breast examination uptake among women in Kelantan.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview of breast cancer

Breast cancer is a major global public health concern. According to the GLOBOCAN, there were approximately 2.3 million new cases of breast cancer in 2022, comprising 11.6% of all cancer cases, making it the second most common form of cancer worldwide. It ranks as the fourth most common cause of cancer-related deaths globally, with 666,000 deaths (Bray *et al.*, 2024). Breast cancer is more prevalent in developed countries than in developing ones, with rates of 55.9 and 29.7 per 100,000, respectively. Nevertheless, women residing in transitioning countries experience a 17% higher mortality rate in comparison to women in transitioned countries (15.0 and 12.8 per 100,000, respectively) (Sung *et al.*, 2021). The higher incidence rate in transitioned countries reflects changes in the prevalence of risk factors, as well as an increase in detection due to the widespread adoption of breast cancer screening (Davis Lynn *et al.*, 2018).

The primary reason for low survival rates in a transitioning country is the late detection of diseases at an advanced stage. Based on a survey that analysed 83 studies conducted in 17 sub-Saharan African nations, it was found that 77% of all diagnosed cases were classified as stage III or IV (Jedy-Agba *et al.*, 2016). Implementing a mammography screening program for the entire population may not be cost-effective or feasible in settings with limited resources (WHO, 2014). Therefore, it is crucial to focus on raising awareness about breast cancer and conducting CBE performed by skilled healthcare providers. This should be followed by prompt and appropriate treatment, as these measures are vital for improving survival rates.

2.2 Breast cancer awareness

In Malaysia, awareness levels vary. A study conducted among urban women in the Klang Valley found that the overall mean knowledge score was 66.4%, with 74.3% having moderate knowledge of risk factors and 76.8% having moderate knowledge of symptoms (Lee *et al.*, 2021). Conversely, research in Kelantan indicated lower awareness levels. In Kelantan, the mean scores for risk factors, symptoms, and screening methods were 55.13%, 59.06%, and 64.97%, respectively, highlighting a significant gap between different regions, groups and populations (Norsa'adah *et al.*, 2022).

Several factors play a crucial role in influencing breast cancer awareness among populations. Education level is a significant determinant of breast cancer awareness. Individuals with higher educational attainment are more likely to understand the importance of early detection and are better informed about the methods of screening and symptoms of breast cancer. For example, a study in China highlighted that women with elevated levels of health literacy demonstrated a greater awareness of breast cancer risks and the benefits of screening practices (Liu *et al.*, 2020). Similarly, research in Kerala, India, found a strong association between education levels and breast cancer awareness (Mohan and Thulaseedharan, 2023).

Moreover, socioeconomic status significantly impacts access to healthcare information and services, affecting awareness levels. Individuals from higher socioeconomic backgrounds are more likely to have access to healthcare resources, contributing to higher awareness and engagement with preventive measures (Hvidberg *et al.*, 2014).

A study among surgical patients in a tertiary hospital in Malaysia revealed that the level of breast cancer awareness was determined to be moderate. Being married, having a personal history of breast cancer, and having a higher monthly personal income positively correlated with higher awareness (Kirubakaran *et al.*, 2017).

Another study in Saudi Arabia revealed that 71% of participants had poor awareness regarding breast cancer warning signs, risk factors, screening programs, and BSE. Factors associated with good breast cancer awareness included the 20–39 age group, women with a bachelor's degree, and women with incomes between 5000 and 15,000 SAR per month (Qedair *et al.*, 2022).

Researchers in Omdurman City, Sudan, showed that factors such as education level, age, personal contact with a breast cancer patient, and residence were found to influence awareness levels, with higher education and direct contact with breast cancer patients correlating with better awareness (Rafat Munir and Sabir, 2023).

2.3 Barriers to healthcare-seeking

A study conducted in semi-rural Malaysia revealed several vital barriers that deter women from accessing breast cancer screening services. Emotional barriers were notably prominent, with fear of diagnosis (74.8%), fear of losing a breast (66.4%), and embarrassment (51.2%) commonly reported, leading to avoidance of screening services. Practical and financial barriers also played a significant role; 69.6% of participants cited cost as a major obstacle, while other practical issues like lack of time (19.2%) and distance to healthcare facilities (47.2%) further hindered their ability to undergo screening. Additionally, the health system itself presented barriers, including discomfort with male doctors (49.6%), delays in securing appointments (23.2%), and

language and cultural misunderstandings with healthcare providers (30.8%), all of which can dissuade women from seeking necessary screening services. Sociocultural factors such as stigma (44.4%) associated with seeking breast health services and lack of family support (21.6%) also negatively impacted women's willingness to participate in screening. Moreover, screening-related barriers like distrust in the effectiveness of screening (11.2%) and pain and discomfort associated with the screening procedures (52.8%) contributed to further avoidance or delays in accessing these critical services (Mohan *et al.,* 2021). These findings highlight the complex interplay of emotional, financial, systemic, sociocultural, and procedural barriers that need to be addressed to enhance breast cancer screening uptake in this setting.

A study conducted in Bangladesh identified several perceived barriers that may hinder females from seeking breast cancer screening services. A significant barrier reported was embarrassment (64.6%), which, fuelled by cultural norms and personal discomfort, may prevent women from seeking screening services. Additionally, a lack of knowledge (58.6%) about breast cancer screening programs and how to perform breast self-examinations was prevalent among participants, potentially contributing to delays in seeking screening. Participants also expressed fears and a lack of confidence in discussing their health issues with healthcare providers and others, further deterring them from accessing screening services and openly addressing their concerns. Socio-cultural factors, including societal norms and attitudes towards discussing health issues such as breast cancer (53.0%), were highlighted as influential in limiting women's willingness to engage in screening programs. Collectively, these barriers underscore the complex socio-cultural and individual challenges that need to be addressed to improve breast cancer screening uptake among women (Amin *et al.,* 2020).

2.4 Breast screening uptake

Breast screening is a vital measure in the early detection of breast cancer, thus improving treatment and reducing morbidity and mortality.

2.4.1 Breast self-examination (BSE) practice

Based on the Malaysian National Health Morbidity Survey (NHMS) 2019, the prevalence of BSE practice was 49.0% (95% CI: 46.0,51.0). Furthermore, the survey found that married individuals were more likely to engage in BSE. Moreover, the prevalence of government employees was significantly higher at 71.5% (95% CI 64.88, 77.33) compared to individuals in other occupational categories. The percentage of respondents without formal education was the lowest, at 25.7% (95% CI 21.2, 30.97), compared to those with other educational levels (NIH, 2020b).

Although BSE is not a screening tool, in less developed countries where imaging and CBE are not readily available, BSE is often the only method for early detection of breast cancer. Besides that, there was a study finding showed that 96% of breast cancers and 81% of positive ultrasound findings were initially identified from BSE (Huang *et al.*, 2022).

2.4.2 Clinical breast examination (CBE) uptake

The World Health Organization (WHO) recognises the value of CBE, particularly in limited-resource settings. WHO recommends CBE as a screening method for breast cancer in such areas, highlighting its role in increasing breast cancer awareness and promoting early detection, which can lead to better treatment outcomes (WHO, 2014).

The uptake of CBE varies across different regions and populations, influenced by factors such as socioeconomic status, knowledge about breast cancer, and

accessibility to healthcare services. For instance, a study in Johor by Mohan *et al.* (2021) reported that the practice of regular CBE is low, with less than 5% prevalence among all main ethnic groups, including Malay, Chinese, and Indian women.

In contrast, research by Rabiei *et al.* (2022) ~~Rabiei et al. (2022)~~ indicated a significantly higher prevalence of CBE at 52.6% among females in Tehran. Similarly, ~~Afaya et al. (2023),~~ Afaya *et al.* (2023) found that 39.7% of women in Lesotho had undergone CBE. In Maldives, Aishath *et al.* (2021) ~~Aishath et al. (2021)~~ reported a prevalence of 41.4% among women who had ever had a CBE. Furthermore, a study in Trivandrum, India, by ~~Ramadas et al. (2023)~~ Ramadas *et al.* (2023) ~~(Ngan *et al.*, 2022)~~reported that 95.7% of the 55,843 eligible women had at least one CBE during the study period.

2.4.3 Mammogram

WHO recommends organised mammography screening programs with a two-year interval for women aged 50−69 years in high-resource settings and conditional implementation in moderate-resource settings if quality conditions are met. In low-resource settings, the focus should be on early diagnosis and treatment for symptomatic women, with CBE as a potential tool. For women aged 40−49 years, screening in high-resource settings is only in the context of research with careful monitoring and evaluation, while it is not recommended in moderate and low-resource settings. For women aged 70−75, screening should also be research-based in high-resource settings and not implemented in moderate and low-resource settings (WHO, 2014).

In Malaysia, according to the National Strategic Plan for Cancer Control Program 2021-2025, MOH (2021) recommends that women aged 40 years and above

who have risk factors undergo a mammogram every year. Meanwhile, mammography can be conducted biennially for women between the ages of 50 and 74.

The prevalence of mammogram screening varies widely across different countries. In South Korea, from 2012-2020, the participation rate for mammography screening in women aged 40 and above ranged from 59.7-71.0% (SY *et al.*, 2022). Another study in Europe showed a high participation rate in mammogram screening across several European countries; for example, in Sweden, Denmark and Finland, the participation rate of mammogram was more than 80% in women aged 50-69 years (Cardoso *et al.*, 2023). Meanwhile, in Malaysia, The National Health and Morbidity Survey (NHMS) 2019 reported that only 21.0% (95% CI 18.00, 23.00) of women had undergone mammography screening within the prior three years (NIH, 2020b).

2.5 Theoretical frameworks

The Health Belief Model (HBM) is a widely applied psychological framework that seeks to explain and predict health-related behaviours, particularly in the context of preventive health services (Rosenstock, 1974). This model suggests that individuals' engagement in health-promotion behaviours, such as breast cancer screening, depends mainly on their perceptions of risk and the balance between perceived benefits and barriers to action. These perceptions, in turn, influence decisions related to breast screening participation, which is the primary focus of this study.

The HBM comprises several key constructs that collectively provide a comprehensive understanding of why individuals may or may not participate in preventive behaviours such as breast cancer screening. These constructs include modifying factors, perceived susceptibility, perceived severity, perceived benefits,

perceived barriers, cues to action, and self-efficacy. Understanding how these constructs interact can help identify the factors influencing breast screening uptake among women, particularly in Kelantan.

Modifying factors are the first construct within the HBM framework, encompassing demographic, sociocultural, and psychosocial variables that indirectly shape health behaviours. These factors influence individuals' perceptions of susceptibility, severity, benefits, and barriers, ultimately affecting their decision to engage in preventive behaviours. For example, demographic factors such as age, education level, socioeconomic status, and marital status can significantly impact health perceptions. Younger women may perceive themselves as less susceptible to breast cancer, while women with higher education levels might have a heightened awareness of the severity of the disease.

Psychosocial factors, including social support, peer influence, and cultural norms, further shape these perceptions. Strong social support from family or peers can enhance self-efficacy, making women more likely to overcome barriers and participate in screening. Cultural beliefs may also play a crucial role in influencing how women perceive the severity of breast cancer and their vulnerability to it.

The following construct is perceived susceptibility, which refers to an individual's belief in their risk of developing a disease, such as breast cancer. Those with low perceived susceptibility may deny their risk of breast cancer, while others may acknowledge the possibility. Women who perceive a high risk of developing breast cancer are more likely to engage in preventive behaviours, such as undergoing CBE, to reduce their risk (Shiryazdi *et al.*, 2014; Ngan *et al.*, 2022).

Closely related to susceptibility is perceived severity, which addresses an individual's belief about the seriousness of breast cancer and its potential consequences. This construct covers the medical implications of the disease and its broader impact on work, social roles, and overall quality of life. Women who perceive breast cancer as a severe condition, potentially leading to disability or death, are more likely to take preventive actions (Abu-Helalah *et al.*, 2015). The combination of perceived susceptibility and severity forms what is known as the perceived threat, which is a key motivator for health behaviour change.

The following construct is perceived benefits; this construct refers to an individual's evaluation of the positive outcomes of a health-promoting behaviour, such as breast cancer screening. Women who believe that screening can lead to early detection, improve survival rates, and reduce the need for aggressive treatments are more likely to participate in such programs (Gang *et al.*, 2013; Shiryazdi *et al.*, 2014).

However, even when the perceived threat is high and the benefits are recognised, perceived barriers can prevent women from participating in screening. This construct refers to an individual's assessment of the obstacles that hinder behaviour change. Barriers such as inconvenience, cost, fear of pain, embarrassment, or lack of access to screening facilities can deter women from undergoing breast cancer screening (Mohan *et al.*, 2021). For behaviour change to occur, the perceived benefits must outweigh these barriers.

Cues to action are triggers that prompt individuals to engage in health-promoting behaviours. These cues can be internal, such as experiencing symptoms, or external, such as receiving information from healthcare providers, media campaigns, or hearing about a friend or family member's illness. For example, women who had

ever received a physician's recommendation for a mammogram were more likely to undergo mammogram screening compared to those who had never received such a recommendation (Abdullah *et al.*, 2022).

Lastly, self-efficacy, a later addition to the HBM, refers to an individual's confidence in their ability to perform a health-promoting behaviour successfully. In the context of breast cancer screening, women with higher self-efficacy are more likely to overcome perceived barriers and complete the screening process (Dagne *et al.*, 2019). Building self-efficacy through education, counselling, and support can significantly enhance breast screening uptake.

In conclusion, this study uses the HBM as a theoretical foundation to explore how modifying factors and perceived barriers, influence breast screening uptake among women in Kelantan.

2.6 Factors associated with breast screening uptake

Breast screening uptake could be influenced by many factors. The following are the reported factors associated with breast screening uptake:

2.6.1 Sociodemographic characteristics

Several sociodemographic characteristics were found to be related to CBE uptake.

2.65.1(a) Age

Age is a crucial determinant of breast screening uptake, with multiple studies across different regions demonstrating varied participation rates among other age groups. A study conducted in Selangor, Malaysia, found that women aged 50-59 were significantly more likely to have undergone a CBE (OR 1.69; 95% CI 1.20, 2.39;

p=0.003) compared to younger women (Htay *et al.*, 2022). Another study in Selangor in 2013 showed that older participants aged 50-74 (OR 2.57; 95% CI 1.05, 6.29; *p*=0.039) were more likely to undergo breast cancer screening (Abdullah *et al.*, 2022). In Iran, similar findings indicated that the probability of CBE uptake significantly increases with each decade of age (OR 1.22; 95% CI 1.13, 1.32) (Tahergorabi *et al.*, 2021). Meanwhile, another study in Lesotho showed that women aged 35-39 have higher odds of undergoing CBE than younger ages (OR 1.4; 95% CI 1.10, 1.78; p=0.007) (Thabane *et al.*, 2021). A longitudinal study in Ireland showed that women aged 55-59 are about 4.7 times more likely to attend breast screening compared to the reference group aged 50-54 (95% CI 3.16, 7.06; p<0.001) (O'Sullivan and O'Donovan, 2022).

2.65.1(b) Ethnicity

Ethnicity was reported to be a significant factor influencing breast screening uptake, as diverse cultural, socio-economic, and health belief systems across ethnic groups can affect attitudes towards health services. A study done in China highlighted that ethnic minority women were less likely to participate in breast cancer screening (OR 0.88; 95% CI, 0.79, 0.98) compared to Han women, the predominant ethnic group (Wu *et al.*, 2019). Another study in Yanbian, China, done previously found that Chinese women were about two times more likely to undergo breast cancer screening than Korean Chinese (OR 2.2; 95% CI 1.25, 3.91) (Gang *et al.*, 2013). Contrasting the trend in China, a study done in Selangor, Malaysia, showed that Indian women, who are a smaller ethnic group compared to Malays, were more likely to have had a CBE (OR 1.57; 95% CI 1.06, 2.31; p=0.023) (Htay *et al.*, 2022).