BULLETIN OF STOMATOLOGY AND MAXILLOFACIAL SURGERY
Volume 21, Issue 7

DOI: 10.58240/1829006X-2025.21.7-443

ORIGINAL ARTICALE

CHALLENGES AND BARRIERS TO BREAST CANCER SCREENING IN RURAL AND URBAN REGIONS: A CASE STUDY OF MALAYSIA

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Received: *Jul 20. 2025;* ***Accepted:*** *Aug 20, 2025;* ***Published:*** *Aug 25, 2025*

ABSTRACT

Background: Breast cancer remains the most prevalent cancer among women globally and a leading cause of cancer deaths. In Malaysia, it accounts for 19% of all cancer cases reported by the National Cancer Registry. This study examines barriers preventing women in rural and urban Malaysia from undergoing breast cancer screenings. The aim is to analyze how infrastructure limitations, awareness gaps, and educational challenges impact screening access and propose
strategies for improvement.

Methods: The study employed a secondary qualitative narrative review to explore rural and urban healthcare disparities in Malaysia. Data for this study was collected from the period 2014 to 2024 using reputable academic databases such as Scopus and Google Scholar. Additional sources include official policy and healthcare reports from the Ministry of Health (MOH), publications by Non-Governmental Organizations (NGOs), reports from the World Health Organization (WHO), peer-reviewed academic literature, and relevant case studies. Thematic analysis has been used to identify key healthcare access challenges and gaps across the country's screening landscape.

Results: Key barriers include inadequate healthcare infrastructure in rural areas, lack of transportation, financial constraints, low awareness, and cultural misconceptions. Rural women face greater challenges due to fewer medical facilities and long travel distances, while urban populations encounter misinformation and fear-driven reluctance. Proposed solutions include mobile screeningunits, improved public transport access, expanded healthcare facilities, and culturally tailored awareness campaigns. Government collaboration and targeted outreach can enhance screening rates
and facilitate early detection.

Conclusion: The study highlights critical screening barriers and the need for systemic improvements. Its qualitative focus on Malaysia limits generalizability. Future research should adopt quantitative methods, cross-country comparisons, and assess educational initiatives. Addressing these challenges can strengthen early detection efforts and improve breast cancer outcomes, enhancing Malaysia’s healthcare system for women's well-being.

Keywords*:* Breast Neoplasms/diagnosis, Mass Screening, Health Services Accessibility, Rural Health Services, Urban Health Services, Health Education.

INTRODUCTION

Breast cancer (BC), with an age-standardized incidence rate (ASR) of 34.1/100,000, is the most prevalent malignancy among Malaysian women, according to Schliemann, Hoe [1]. Among women of all ethnic backgrounds, it is the most prevalent cancer; the age range of 45 to 69 years old has the highest age-specific incidence. A significant issue in Malaysia is late-stage presentations, which rose from 43.2% in 2007-2011 to 47.9% in 2012-2016. To improve outcomes for cancer patients and discover and treat cancer early, BC screening of asymptomatic women is essential [2]. The two most widely used BC screening techniques worldwide are mammography and clinical breast examination (CBE). An X-ray imaging technique called mammography is used to check for tumors in the breasts [3]. All Malaysian women between the ages of 50 and 74 should be given a mammogram every two years to screen for breast cancer, but the Ministry of Health says this should only be done on an as- needed basis [2].

Breast cancer awareness and screening measures haven't been very successful in rural regions and have not helped much with mammography testing, even after Tan et al. started mobile screening camps, as emphasized by Tan, Jamil [4]. According to reports, the rate can be found between 6.8% and 8.3% in rural settings and between 8.3% and 15% in both urban and suburban locations.

Understanding the barriers that women and medical teams in rural areas face when doing BC screening is necessary to improve screening in Malaysia [5]. BC screening and female health-seeking through the breast in Malaysia are influenced by ethnic group and residence. Disparities in early detection and survival are probably caused by the different health-seeking habits and levels of knowledge among Malaysian women from the three ethnic groups [6].

Research by Lee, Ma'ruf [7] highlighted that Malaysia's overall healthcare has big gaps in terms of extent in urban places and extents rural areas. Since most people in Kenya live in urban centers such areas are considered to have better health care utilities, health care facilities, and other qualified personnel. Still, the take-up of breast cancer screening is sub-optimal in these areas because few women remain aware there are cultural taboos surrounding breast cancer and there are competing demands for attention in women's lives, according to [8]. However, rural areas present many complexities, such as inadequate infrastructure, long distances to health facilities, and a shortage of healthcare professionals. These problems reduce the chances of screening and due to these, there is delayed diagnosis of a condition that raises mortality levels [9]. Specifically in rural regions, the uptake of breast cancer screening services in Malaysia is also lower than expected. The reasons why there are so many are attributed to a lack of infrastructure, insufficiency of healthcare facilities, cultural attitudes, unawareness, and education regarding breast cancer, as emphasized by Islam, Billah [10]. Hence, urban areas are not normally confronted with healthcare facilities but also have problems of misinformation, social stigma, and resistance of culture regarding screening. Early detection is hampered by the lack of infrastructure in rural areas such as screening centers, well-trained medical personnel, and diagnostic equipment [11]. Research by Sajahan and Omar [12] shows that regular screening is discouraged owing to the many distances that women in these regions have to travel to get healthcare services. Despite the presence of these facilities in urban areas socio-cultural factors like fear, lack of knowledge, and misconception concerning breast cancer continue to deter people from screening uptake negatively.First, it is important to learn the key difficulties of each group, and then use customized ways to help people understand and use health services. In particular, this study looks at the challenging nature of healthcare infrastructure and the obstacles people in Malaysia face in learning about screening. As well, it lists ways to improve screening by using outreach, mobile clinics, and revisiting public policy.

This study hopes to provide practical methods to help more people get health care easily and to discover breast cancer sooner, hence reducing differences in outcomes for breast cancer patients. Breast cancer ranks very high among the causes of death in women in Malaysia, largely because few have access to early detection measures. In recent years, research on how to reach general healthcare has been done, but not much on challenges unique to accessing breast cancer screenings in both rural and urban settings [1, 2, 4]. Issues with the healthcare system, cultural beliefs, and unawareness stop many individuals from participating in screening. Health policies have overlooked these problems to a large extent. The purpose of this study is to highlight what keeps people from getting screened and give ideas for making sure screening is available to all.

One of the aims of this study is to help close the knowledge gap about breast cancer screening in both urban and rural areas of Malaysia. Researchers have looked into overall healthcare access, but not at what may be stopping people from getting cancer screenings [13,14]. Research shows that problems with breast cancer screening result from insufficient medical facilities in some regions and some people's cultural beliefs. What it involves are mobile medical centers, community activities, and good policies that encourage equality in early cancer diagnosis.

This study's objective is to analyze the obstacles and difficulties associated with breast cancer screening in Malaysia's rural and urban areas. Study objectives are given below;

1. To identify how inadequate infrastructure and lack of healthcare facilities limit access to breast cancer screening in rural and urban areas of Malaysia.
2. To analyze the impact of awareness and education challenges on breast cancer screening uptake.

3. To evaluate the key factors for improving breast cancer screening facilities and awareness in Malaysia.

This study is relevant as it points out the huge hurdles in getting breast cancer screening in Malaysia; infrastructure gaps, awareness problems, and cultural prejudices. The purpose of the research is to provide an understanding of these barriers for use by healthcare providers, community groups, and policymakers to increase access to screening services so that everyone, regardless of geographic residence, income, education, or race has equal access to these services. Its findings help reduce health disparities, enhance early detection rates, and ultimately improve cancer outcomes in both rural and urban populations.

MATERIALS AND METHODS

To choose the right research methodology, this study followed the framework described by Saunder in research onion. Sahay [15] points out that all the study components in each layer exhibit how researchers fit together multiple philosophies, tactics and strategies for their research.

2.1.Research Philosophy

This analysis was conducted using the Interpretivist philosophy, unlike positivism which admits that human life and social experiences are not simple. Applying this philosophy is most relevant for examining why some women in Malaysia find it hard to participate in breast cancer screening, given that their experiences and backgrounds with healthcare can be well understood. The way in which breast cancer screening decisions are affected by a person's background and interactions can be fully explored through Interpretivism [16].

According to Fitts [17], interpretivism provides a means for researchers to analyze qualitative data to 137 help gain an understanding of the particular social and cultural obstacles that influence access to 138 healthcare in rural and urban areas. Marshall [18] further emphasizes that through interpretivism the research can delve into depths of real-world cases which are formidable for the researchers to study complex social issues like healthcare disparities. Junjie and Yingxin [19] highlight that interpretivism uses the social contexts in which people live to explain where and why cultural factors help or compromise breast cancer screening. This philosophy usually employs approaches such as secondary data analysis, cases, and ethnographic approaches. Similarly, Zahle[20] notes that this allows something to be extracted from interpretivism the extraction of rich qualitative insights, such as personal narratives and community perspectives that are essential for capturing how and why healthcare access barriers occur.

2.2. Research approach

The use of the inductive research approach was selected for this study as breast cancer screening in different regions of Malaysia was complex and variable [21]. The challenges and barriers to screening can vary significantly between rural and urban areas, depending on socio-cultural norms, healthcare infrastructure, and individual perceptions [22]. Where utilized inductively the researchers can look at the differences in these concepts without the constraint of preexisting theories and allow new insights to emerge directly from the data. This flexibility is essential to these efforts to identify unique factors such as cultural beliefs, education levels, and local healthcare policy that might influence access to screening in ways previously unrecorded [23]. In particular such research starts with data collection and analyzes the data to build its foundation from there. Looking only at how conclusions are drawn does not reveal the ways communities respond to breast cancer screening methods [24].

2.3.Research Design: Narrative Review

A Narrative Review describes the general situation being studied so that the researchers can examine the issues related to breast cancer screening in rural and urban areas in Malaysia. The approach is just right for sociology because aspects like access to health and infrastructure, learning, awareness and culture are all complex and connected [25]. Experts prefer narrative reviews to systematic reviews since they have a greater ability to source and examine different literature [26]. It makes it possible to use various kinds of data such as research articles, reports from government agencies and NGOs, policy papers, and case studies which is very important in studying healthcare disparities inMalaysia. This variety of data is important for reaching the first objective by exploring how lingering problems with facilities and infrastructure hinder screening access. For the second objective which deals with awareness and education, researchers explore cultural, social, and behavioral aspects by reading qualitative and narrative sources. A narrative review accepts such materials, allowing researchers to thoroughly review and link key information about health literacy, how people view screening, and how well efforts to promote screening are working [27]. The narrative review makes it possible to combine lessons from different breast cancer screening programs. It helps the researchers spot developing topics,

understand what knowledge is still missing, and notice what works best, offering ideas for changes [28]. The main goals of the study are met through the narrative review's focus on detail, interpretation, and refined discussion, giving a helpful platform to analyze and manage breast cancer screening issues in Malaysia.

2.4. Research choice

The selection of research approaches, either qualitative or quantitative (the mono-method approach), is a key decision in research design. To explore the challenges and hindrances of the rural and urban population in breast cancer screening in Malaysia, this study adopted a qualitative mono-method approach.

However, the use of interviews and case studies is a natural type of qualitative method when dealing with issues of great sensitivity to health or health factors that affect its access [29]. Since a case study approach allows researchers to deepen the analysis of real-world issues in a rich context, it was chosen to allow an understanding of the distinctive challenges that confront distinct communities.

This process enables researchers to look into factors such as insufficient infrastructure, cultural resistance, and awareness levels, which might not be equipped to a degree by using quantitative methods. [30].

2.5. Strategies for Data collection

While doing the review, the process is flexible and systematic to feature papers that are acceptable,
191 diverse, and significant. Using this structure lets the review discover the reasons breast cancer screening is not broadly available in Malaysia. Examining MOH policy and healthcare 192 reports, NGO reports, WHO publications, and case studies has provided me with a helpful understanding of the situation. Apart from the analysis of records, the plan uses both kinds of methods qualitative and quantitative, and survey information to examine the relationship between screening, culture, and healthcare availability.

Table 1. Sources of Reports Utilized for Data Collection

SOURCE	REPORTS	LINK OF SOURCES
Ministry of Health Malaysia (MOH) Reports	National Strategic Plan for Cancer Control Programme (2016-2020)	https://www.moh.gov.my/moh/resources/Penerbitan/Rujukan/NCD/Kanser/National_Strategic_Plan_Book_final@25SEPT2017.pdf
	Malaysia National Cancer Registry Report 2012-2016	https://nci.moh.gov.my/images/Laporan/MNCR_2012-2016_FINAL_PUBLISHED_2019.pdf
	Management of Breast Cancer (3Edit) ClinicalPractice Guidelines (2019)	https://mymahtas2.moh.gov.my/files/CPG_Management_of_Breast_Cancer_(Third_Edition)_.pdf
	Early Detection of Common Cancers Module for Health Care Providers	https://www.moh.gov.my/moh/resources/Penerbitan/Rujukan/NCD/Kanser/EARLY%20DETECTION%20OF%20COMMON%20CANCERS%20MODULE%
	Health TechnologyAssessment Report: Breast Cancer Risk Prediction Model	https://www.moh.gov.my/moh/hta/Executive_Summary_HTA_HRA_breast_cancer._.pdf
World Health Organization (WHO) Publications	Guide to Cancer Early Diagnosis (2017)Assessing National Capacity for the Prevention and Control of Noncommunicable Diseases (2020)	https://www.who.int/publications-detail-redirect/guide-to-cancer-early-diagnosis https://www.who.int/publications/i/item/9789240071698
NGO-Breast Cancer Welfare Association (BCWA)	BCWA - Together Towards Wellness!	https://www.breastcancer.org.my/
NGO-Pink Ribbon Wellness (L) Foundation	Public Lectures and Workshops (2015-2021)	https://www.pinkribbonwellnessfoundation.org.my/past-events/

For this study, authors consulted articles from Scopus and Google Scholar which all guarantee the publications have been carefully reviewed. Papers were chosen using the filters of inclusion and exclusion and researchers noted the language,sampling design, study technique and date of publication. To keep the information current, study included only articles published between 2014 and 2024. Information about the case studies and journal articles authors refer to throughout the study, including their titles and main sources can be found in the table below. The data here supports the organization and interpretation of research findings.

Table 2. Case studies and journal articles utilized in this study

Publication year	Citations/links	Titles of case studies/journal articles
2022	(6)	Changing Health Beliefs about Breast Cancer Screening among Women in Multi-Ethnic Malaysia
2022	(31)	Factors Associated with Screening Mammogram Uptake among Women Attending an Urban University Primary Care Clinic in Malaysia
2017	(32)	Performance of a Subsidised Mammographic Screening Programme in Malaysia, a Middle-Income Asian Country
2015	(33)	A Cross-Sectional Study on the Motivators for Asian Women to Attend Opportunistic Mammography Screening in a Private Hospital in Malaysia: The MyMammo Study
2022	(1)	Challenges and opportunities for breast cancer early detection among rural dwelling women in Segamat District, Malaysia: A qualitative study
2021	(2)	Breast Cancer Screening in Semi-Rural Malaysia:Utilisation and Barriers
2023	(4)	Breast cancer and breast cancer screening Use beliefs and behaviors in a nationwide study in Malaysia
2022	(34)	Breast and colorectal cancer awareness in Malaysians and barriers towards screening: Asystematic review
2014	(35)	Clinical Breast Examination is the Recommended Breast.
		Cancer Screening Modality in a Rural Community in Malaysia; What Are the Factors That Could Enhance Its Uptake?
2022	9	Women's health beliefs and uptake of breast cancer screening in Malaysia
2018	12	Common Issues and Challenges of Breast Cancer Awareness in Malaysia: A Contemporary Scenario
2014	36	A Review of Breast Cancer Research in Malaysia
2017	37	Awareness of breast cancer among surgical patients in a tertiary hospital in Malaysia
2016	38	Result of randomized control trials toincrease breast health awareness among Young females in Malaysia
2021	39	The effectiveness of educational interventions on breast cancer screening uptake, knowledge, and beliefs among women: a systematic review
2021	35	Breast cancer screening in Malaysia: a policy review
2018	40	The ‘Be Cancer Alert Campaign’: protocol to evaluate a mass media campaign to raise awareness about breast and colorectal cancer in Malaysia.
2014	41	Awareness and prevalence of mammography screening and its predictors-a cross-sect study in a primarycare clinic in Malaysia
2015	42	Association of knowledge and cultural perceptions of Malaysian women with delay in diagnosis and treatment of breast cancer: a systematic review

2.6. Data Extraction and Thematic Analysis

In this narrative review, data extraction has been conducted manually using a thematic analysis approach, guided by the research objectives. The analysis aims to identify recurring patterns and concepts across the selected literature and interpret them within the Malaysian context. As this was a complex and exploratory study into breast cancer screening, thematic analysis is a very potent qualitative research method to use [43]. Systematic approaches for extracting codes and themes from qualitative data were provided by this approach. The smallest analytical unit of a code brings to the limelight some critical problems that are as to the research question. A thematic analysis was used to identify recurring concepts, theories, and challenges about breast cancer screening from a thorough literature review (44). It categorized and analyzed the main principles and barriers arising from the reviewed literature. Its flexibility allows thematic analysis to be used in pursuing complex public health issues (such as those of access to healthcare and screening disparities). It helps in identifyingand interpreting patterns (theme) in qualitative data to describe the challenges, and barriers of individuals living in rural and urban areas of Malaysia against breast cancer screening [1].

Table 3. Thematic Framework Table

Main Theme	Subthemes	Linked Research Objective
Geographic and Infrastructural Barriers to Breast Cancer Screening in Malaysia	Geographic Distribution of Healthcare Facilities Transportation Barriers to Healthcare Access	Objective 1: To identify how inadequate infrastructure and lack of healthcare facilities limit access
Impact of Awareness and Education Challenges on Screening Uptake	- Absence of Awareness Campaigns - Cultural Barriers and Stigma	Objective 2: To analyze the impact of awareness and education challenges
Key Factors for Improving Breast Cancer Screening Facilities and Awareness in Malaysia	- Government Investment and Policy Support - Effectiveness of Localized Education Programs	Objective 3: To evaluate the key factors for improving screening and awareness

2.7. Limitations

As a narrative review, this study's methodology is subjective and relies on the researcher'sinterpretation, which may introduce selection bias due to non-systematic literature sampling. It may lack the comprehensiveness of a systematic review, limiting generalizability, but it prioritizes rich, contextual insights from the available literature.

2.8 .Ethical considerations

This review uses only secondary data from publicly available sources, so ethical approval is not required. All sources have been accurately cited to ensure transparency. Researcher bias has been minimized through critical analysis and by openly acknowledging any limitations in the reviewed literature [45].

3. FINDINGS/ DISCUSSION

This section provides the findings and discussion of the study. Discussion should be based on sources mentioned before in the methodology section whereas, the summary of features of case studies and academic articles are mentioned in appendix-A.

3.1.Ratio of data collection sources

The figure below indicates that the information breaks down 29 publications into these categories: 7 are reports, 3 are related to NGOs and 20 are journal articles or case studies. The amount of material in the database reveals that articles, case studies, and NGO reports all contribute useful information about breast cancer awareness and screening in Malaysia.

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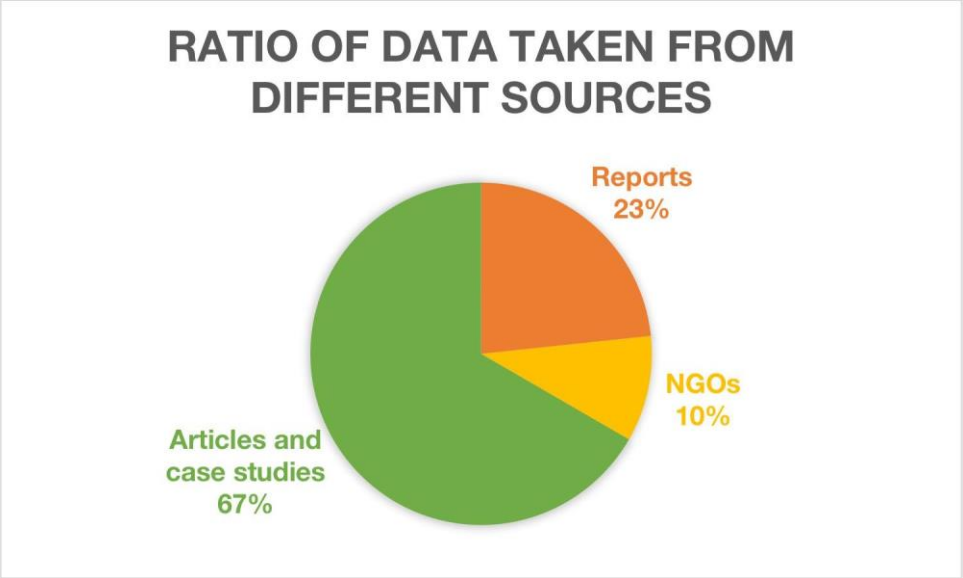

Figure 1. Ratio of data collection sources

Theme-1: Inadequate infrastructure and lack of healthcare facilities limit access to breast cancer screening in rural and urban areas Sub-theme 1: Geographic distribution of healthcare facilities The study looks at how a lack of medical services in certain areas causes people living in both cities and rural areas to miss out on breast cancer screenings. The Malaysia National Cancer Registry Report for 2012 to 2016 found that many breast cancer cases were caught early on, mainly because access to early screening in some areas is very limited [46]. This result highlights that structural differences prevent early cancer detection among people in rural and poor urban areas.

Evidence by Htay, Donnelly [5] revealed that the majority of women in rural Malaysia must walk over 50 kilometers to access a mammography facility and as Akhtari-Zavare, Juni [38] discovered, these centers are frequently limited in their diagnosis tools. The research brings out that managin and locating new businesses in rural towns presents specific difficulties. Research done by Sajahan and Omar [12] in Segamat District reveals that a lack of close medical centers for rural women is a major barrier. Cities with medical centers everywhere often face crowded clinics, people

have to wait a long time and services are not always distributed fairly. Mammography equipment is available in urban parts of Malaysia, but difficulties in the system stop many poor or marginalized women from getting screened. However, improving implementation is still needed [39, 41]. To illustrate, Paramasivam, Schliemann [34] pointed out that urban patients still face barriers because of unequal distribution of resources, uncertain service quality, and lacking transportation or knowledge about health services.

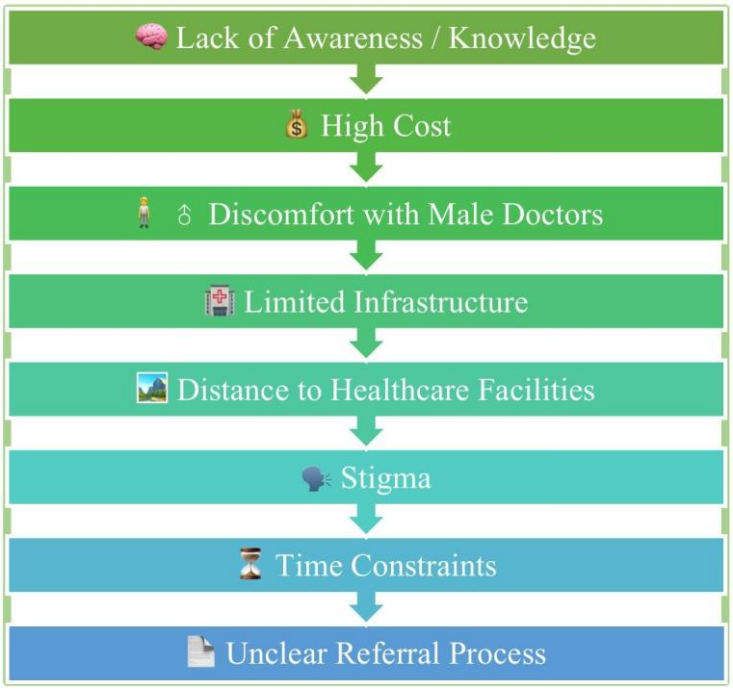

Figure 2. Barriers to BC Screening and Health-Seeking

Created by Authors

The data in Figure above barriers to breast health and screening in Malaysia, including fear of diagnosis (74.8%), cost (69.6%), and stigma (44.4%). Limited infrastructure, distance to healthcare facilities (47.2%), and discomfort with male doctors (49.6%) exacerbate access challenges [35]. Mobile units, subsidized services, and culturally sensitive care could improve accessibility. According to the WHO's report, the biggest challenge for LMICs, including Malaysia, is delaying

cancer diagnosis because these nations lack the right infrastructure [47]. Sub-theme 2: Transportation Barriers to Healthcare Access Transportation continues to be a key structural barrier affecting access to breast cancer screening in both rural and urban Malaysia. In rural communities, poor road infrastructure, long travel distances,and lack of affordable public transport hinder access to screening centers [37]. In addition, becausethere are not enough health facilities nearby, women need to drive over 40 km on bumpy, poor roadsduring monsoon season, increasing the chances they fail to keep their mammogram appointments.Women who cannot travel privately often find it difficult to use services in some rural places [46]. Amajority of rural women over 60% reported missing health appointments due to difficulty getting

reliable rides and this problem worsened during weather events, Schliemann, Donnelly [40] alsoobserved that users often arrive late due to dependable family or neighbor rides and have to give upon their scheduled appointments. Low numbers of mammograms among Malaysian women fromrural regions are commonly linked to problems with reaching clinics [48].Urban populations face different but equally challenging transportation barriers. Despite morehealthcare facilities, high transport costs, long travel times due to congestion, and overcrowded public systems pose serious problems [31,32]. Many urban poor families cannot afford transport fares, and unsafe roads discourage travel. Even well-informed women often forgo screening due tothese logistical and financial constraints [42].A case study by Abdullah, Baharudin [31] found that only 25% of women at a university clinic in Kuala Lumpur had ever had a mammogram. Despite being well-informed, many cited time constraints and financial barriers as primary reasons for not attending screenings.

Figure 3. Main barriers to primary health care in Malaysia

Created by Authors Figure 3 emphasizes that 33.3% of surveyed refugee women identified transport as a primary barrier. Additionally, overcrowding and limited public transport during peak hours further limit healthcareaccess in urban areas [42]. Mobile mammography units from the National Cancer Society Malaysia have shown potential inreaching underserved populations, but coverage remains limited due to logistical and funding issues. Subsidized transportation programs have helped reduce indirect screening costs and increase attendance in trial areas. Similarly, Pink Ribbon Foundation campaigns often include transport support to boost participation in low-income urban zones [49].

Table 4. Comparison of Rural and Urban Healthcare Facilities

Factor	Rural Areas	Urban Areas
Sub-theme 1: Geographic Distribution of Healthcare Facilities		
Availability of Facilities	Very limited Only 20_30% have nearby screening facilities (5)	Higher availability Over 70% of facilities are urban-based (2)
Facility Quality	Facilities often under-equipped (38)	Better equipment, but overstretched and long waiting times (34)
Equity in Service	Low - significant geographic	Moderate - availability exists, but not
Distribution	inequality in facility distribution (2)	always accessible to urban poor (34)
Sub-theme 2: Transportation Barriers		
Distance to Facilities	Higher than 50 km travel common for rural women (5)	Less than 10 km typically, but travel delays due to congestion (7)
Transportation Barriers	Poor roads, long travel, lack of public transport -affects (1)	High transport costs, traffic, and limited options for low-income groups (50)

Theme-2: Impact of awareness and education challenges on breast cancer screening uptake Sub-theme 1: Absence of Awareness Campaigns Research emphasizes that a critical barrier to promoting breast cancer screening participation is a lack of broad, consistent awareness campaigns. Many women in rural areas are unaware of the need for detection early and the accessibility of the screening service (39). A study by Paramasivam, Schliemann (34) demonstrated that a significant portion of the population is unaware of therecommended frequency for mammograms, which aligns with findings in the National Strategic Plan for Cancer Control Programme (2016-2020) that cite poo

dissemination of screening guidelines [2]. CBE is mostly under-practiced in public health facilities, partly due to lack of resources there [46.1, 2] agree that mass media and community programs are not always effective and do not reach most rural communities. Although programs use digital tools in cities, many older or digitally untrained women are usually not included [33]. From the 2017 NCSM report, it was clear that while these services were introduced, problems with finances made it difficult to reach many areas [51]. As a result, the WHO recommends using cultural awareness programs on TV, radio, social media and through in-person meetings to reach more people [47]. Moreover, research underscores the need to include educational modules during regular healthcare visits to normalize discussions on breast cancer and screening [32]. The survival rate of breast cancer patients after 5 years in three countries: Japan (88.9%) USA (88.8%) and Malaysia (66.8%). With the high disparity in terms of the survival rates, one can see health infrastructure, population awareness, and the availability of early screening programs as one of the factors. The relatively low rate of Malaysia can be explained by such factors as the cultural stigma, the lack of information about symptoms, and the inability to access timely diagnosis services. The necessary steps to reduce this gap are to make culturally sensitive awareness campaigns, screenings more accessible, and attract vulnerable populations to consultation at the early stages of the disease to increase survival rates. Sub-theme 2: Cultural Barriers and Stigma It has been found that there is additional stigma and cultural beliefs against breast cancer screening uptake in Malaysia. Some communities still find it taboo to talk about breast health and refrain women from receiving information or getting screenings. The study emphasizes that screening programs are deterred by fear of cancer diagnosis and the corresponding social consequences [1]. Moreover, MOH's Early Detection Module for Healthcare Providers explains that many patients might be hesitant to discuss breast cancer since modesty, shyness or religious feelings often stand in the way [52]. According to Htay, Dahlui [9] in certain communities, the idea persists that cancer must lead to death. The belief of some makes people less likely to engage in early screenings or follow-up visits. Because many rural and semi-rural areas value traditional healing approaches patients often face more time before their illness is treated or diagnosed [4]. In their outreac programs, the BCWA has pointed out that some conservative groups do resist and that most of thei materials do not often address issues in a culturally sensitive way [53]. It is reported that fear of being isolated from society or of losing femininity stops many women from taking part in screenings [35,36]. Pink Ribbon Wellness Foundation shows that participation increased where peer support groups and survivor-led workshops were conducted, especially when held in community or religious spaces (Pink Ribbon Foundation, 2021). A case study by Schliemann, Teroerde [54] in rural Segamat District, Johor, Malaysia revealed that women avoided screenings due to stigma and beliefs that breast cancer was a curse. One participant noted, "People donot talk about breast cancer here. If someone has it, they keep quiet because others might avoid them." A BCWA-led program using female promoters, survivor stories, and mosque sessions raised CBE attendance by 20% in six months through culturally sensitive outreach. The following table created by author shows the barriers and how these barriers cause challenges. Moreover, it shows the impact of each barrier with their possible solutions.

Table 5. Educational and Cultural Barriers Affecting Breast Cancer Screening Uptake in Malaysia (Created by Authors)

Barrier	Challenge	Impact	Solution
Awareness	Few campaigns, especially rural	Low knowledge of screening	Mass & local awareness efforts
Communication	Digital tools miss older/rural women	High-risk groups not reached	Peer-led, door-to-door outreach
Infrastructure	Limited CBE, high costs	Missed early detection	Mobile units, subsidies
Cultural Taboos	Modesty, religion block discussions	Hesitancy to screen	Female staff, religious outreach
Social Stigma	Fear of judgment or isolation	Concealment, screening avoidance	Survivor stories, family education
Traditional Beliefs	Trust in traditional remedies	Delayed diagnosis and treatment	Cultural integration in education

Theme-3: Key factors for improving breast cancer screening facilities and awareness in Malaysia Sub-theme 1: Government Investment and Policy Support Research suggests that rural regions, at the same time as regularly lacking infrastructure and funding, have visible a hit breast cancer screening applications, demonstrating high participation quotes without vast government investment. However, constrained healthcare sources and inadequate investment remain huge boundaries, mainly in Malaysia, in which the call for cancer screenings keeps on to upward rise. A case study by Ryu, Paik [55] on the screening program backed by the government in Malaysia revealed that, despite subsidies, only about 40% of people had taken up screening, mainly because there was a lack of effective promotion and follow-up efforts. That shows that having better-built policies and more allocated finances is crucial. Moreover, Htay, Dahlui [9] pointed out that effective cancer screening programs should be part of public health activities, especially maternal health which matches the guidelines of the MOH [56]. Moreover, research by Schliemann, Donnelly [40] demonstrated that Integrating breast cancer screening into present public health programs, including maternal and child health programs, can improve coverage and participation, as seen in successful initiatives like Singapore's sponsored screening applications [39]. It is clear from studies such as [1, 35, 36] that these programs only work well and last with proper Government review and supervision. Also, research by Yip, Pathy [36] note that city centers provide better medical services, but their challenges with breast cancer screening are partly because of not enough financial support or proper government policies. There are man medical requirements which take funding away from screening programs. They also revealed that by adding screening to existing health services for mothers, the number of people taking part I screening can go up [5]. The Ministry of Health report from 2018 goes on to propose finding those most at risk by using risk models and directing resources more effectively. Sub-theme 2: Effectiveness of Localized Education Programs Teaching people in communities about breast cancer and when to get screened has worked well in both rural and city areas. They use news and programs that are right for local listeners and help address the community's problems with healthcare, reading and various cultural biases [36]. As an illustration, introducing health talks and workshops using community means and mobile health has allowed us to reach over 70% of rural women. Research by Yusof, Chia [41] indicates that individuals in big cities deal with crowded schedules and a tendency to incorrectly estimate the incidence of breast cancer. Local programs in cities usually address these problems with the help of current technology and continuous communication. Since new mobile features and health tips were added, the number of screening appointments has increased by 60% [35]. Research shows that workshops using multimedia, such as visuals and videos, have seen participation rates of 75%, while partnerships with NGOs have led to a 40% increase in first-time screenings at health fairs [39]. A case study by Abdullah et al. at an urban university clinic highlighted that personalized reminder via SMS and mobile apps increased mammogram uptake by 60%, supporting the efficacy of technology-enabled outreach. Research by Htay, Donnelly [5] demonstrated that in rural areas, educational materials with simple language and visuals have bee effective for individuals with low literacy levels [37]. Also in urban areas, localized education uses social media platforms to spread awareness with an average engagement rate of 25% for targete campaigns. Additionally, including SMS reminders to be sent to city residents has been related to a 35% growth in their annual mammogram adherence [2]. BCWA (53) MURNI program during a pink bus tour helped deliver education on breast health and CBEs to rural areas. Retired nurses and survivors presented this and compared to regular methods, more knowledge and testing for breast cancer resulted (e-MJM). Also, to help, the National Cancer Society Malaysia (NCSM) started a free mammography program for disadvantaged women with the aid of an insurance company and 15 hospitals. Since the initiative teamed up with NGOs to subsidize transport, more than 5,000 women 62%) found out about the program for the first time [51]. They show how projects that focus on education and work with NGOs lead to increases in breast cancer screening in Malaysia's rural and poor communities.

4. CONCLUSION

4.1.Final Conclusion

The study concluded that having good transportation and education is necessary for screening to be available to Malaysians. Not having many healthcare centers in rural areas, along with the difficulty of getting there and the great expense, hampers screening for many people. Other major problems people in cities encounter include busy medical centers, not enough money and a lack of good public transport. This study points out that immediate steps must be taken to help people living in neighborhoods and urban areas have better access. Besides having the right infrastructure, it is hard to

find local data and acceptable training for those in rural areas, while city-dwellers are often put off by the stigma surrounding breast cancer and common myths. Not having set breast cancer lessons causes different levels of community education and allows those disparities to widen. Culturally appropriate applications, digital tools and activities designed by survivors can help find problems early and change negative ideas.

To enhance Malaysia's breast cancer screening system, different approaches should be used together.

Supporting rural healthcare with mobile screening, local healthcare facilities, and secure mammograms will help reach rural families and in cities, policies of backup for financially challenged agencies are required. Furthermore, country regulations need to create uniform training activities, engage networks of volunteers, and partner with NGOs to reach and involve more people. If structural and educational problems are considered when introducing targeted reforms, Malaysia will have a lasting and equal breast cancer screening program. Adopting this method lets people find and treat diseases earlier, decreases mortality, helps everyone enjoy equal health services, and supports flexible health care for years to come.

4.2.Limitations and Recommendations of Study

In this work, results from research and firsthand experiences help demonstrate obstacles to breast cancer screening in Malaysia. Still, the results are limited by using pre-existing information which might not show the latest changes or experiences of all population groups. What is published may be limited by the scope, area, or procedure of the original investigations, reducing both the knowledge gained and its usefulness to a variety of contexts. Since follow-up questions cannot be asked or new themes addressed in real time with secondary data, the results often miss the detailed observations found in primary stories. Since there are limitations, future studies should try to add primary interviews or ethnographic work to understand women's views on breast cancer screening better. Looking at other developing nations in Southeast Asia could provide information about what holds them back and helps build awareness across the region. Increasing the usefulness of screening initiatives means that future strategies should address community values and beliefs using culturally appropriate methods. They can be trailed and assessed using direct comments from individuals living in rural and underserved areas. Including well- respected residents and witnessing survivors' stories within efforts to raise awareness can bring more honesty and trust to those efforts. Teaming up across various fields and getting support from policies will help overcome limits in infrastructure and provide equal access to screening services for all in Malaysia.

Compliance with ethical standards

Acknowledgments

We would like to express our sincere gratitude to Lincoln University College, Kuala Lumpur, Malaysia, for their continuous support and encouragement throughout this research.

Conflict of interest

All authors have no conflicts of interest.

Authors' Contributions

All authors played integral roles in shaping the direction and execution of this narrative secondary qualitative research. The lead author was primarily responsible for designing the study, developing the research questions, and synthesizing the narrative findings from the literature. Co-authors contributed to identifying relevant sources, thematic categorization, and refining the conceptual framework. All authors collaboratively reviewed and edited the manuscript to ensure coherence and scholarly rigor. All authors approved the final version and are accountable for the work's accuracy and integrity.

Funding Information

This research did not receive any external funding. The study was independently conducted by the authors, and supported by our respective institutions.

Data Availability Statement

The data utilized in this narrative secondary qualitative research were derived exclusively frompublicly available secondary sources, including MOH policy and healthcare reports, NGO reports,WHO publications, and case studies. Literature was accessed through academic databases such as google scholar and Scopus. All references and data sources are documented and can be provided upon reasonable request to the corresponding author.

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