RESEARCH ARTICLE

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Breast Cancer Myths, Mysterious Miracles and Mistrust among Rural Womenfolk in Sarawak

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Abstract

Background: Sarawak hospitals report high rates of advanced cancer among women in remote rural areas. Cultural beliefs, low awareness, socio-economic challenges, geographical barriers, and the lack of specialist cancer care contribute to late diagnoses, particularly in breast cancer, exacerbating disparities in access to timely treatment. **Objective:** This study aimed to explore cultural beliefs, barriers, and healthcare access challenges influencing breast cancer awareness and screening among Sarawak's indigenous and rural communities. **Methods:** This qualitative study explores how rural Sarawakian women perceive breast cancer and their access to healthcare. Twenty women from three main geographical terrains in Borneo-coastal, riverine, and highland areas participated in the study. After informed consent was obtained, semi-structured interviews were conducted. Data was coded and thematically analyzed to identify cultural nuances affecting their knowledge. **Results:** The study found a strong link between cancer and negative beliefs rooted in sociocultural backgrounds. Myths varied, but most associated cancer with death, a fatalistic culture relying on spiritual faith for healing. Participants delayed seeking medical help until "the pain is unbearable," often using oils and herbs first. Lack of knowledge and lack of access to information about cancer are two main findings from the study. Although the majority of the respondents were not equipped with adequate information, they expressed interest in learning about breast screening programs and attending breast cancer awareness campaigns. **Conclusion:** The findings will be used to design behavioral intervention modules to educate rural Sarawak populations about the importance of breast self-examination (BSE) practices, early detection, and screening.

Keywords: Breast Cancer Awareness- Cultural Beliefs- Rural Health- Sarawak Borneo- Early Detection Strategies

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Introduction

Cancer is the second leading cause of premature death in Malaysia, with breast cancer being the top cause of cancer death among women [1]. Breast cancer poses a significant healthcare burden both in Malaysia and globally, with cultural beliefs playing a key role in influencing diagnosis and treatment, especially in rural areas. Malaysia's 5-year breast cancer survival rate is 67%, one of the lowest in the Asia Pacific. Breast cancer mortality for women aged 30-69 is 73.3 per 100,000, similar to ischemic heart disease (75.8 per 100,000) [1, 2]. Due to limited diagnostic resources in rural areas, about 50% of breast cancer patients are diagnosed six months after initial presentation, with only 6.7% diagnosed within a month [3]. Misconceptions about breast cancer, along with limited access to healthcare, result in delayed diagnoses and poor survival rates, with 47.9% of cases presenting at stages III and IV [2, 4].

Cultural beliefs significantly impact breast cancer detection and management. In rural Vietnamese women, these beliefs contribute to later-stage detection [5]. Similarly, in Sub-Saharan Africa, cultural ideas about breast disease origins and societal expectations delay cancer treatment [6]. The 2019 Malaysian Clinical Practice Guidelines (CPG) recommend clinical breast examinations (CBE) for women aged 35+ and mammograms based on individual risk factors [7]. However, mammogram uptake in Malaysia remains low, between 7-30% of the target population [8]. Participation in CBE also declines with age, which is concerning as breast cancer risk increases with age [9]. Malaysia lacks a population-based mammography screening program, relying on CBE to trigger opportunistic mammograms for abnormalities.

Breast self-examination (BSE), recommended monthly in the Malaysian CPG, is encouraged to raise awareness

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and empower women to take charge of their health. However, BSE practice is low. Among female students, only 19-25% perform regular BSE [10], and only 23.3% of women in a semi-rural area report regular BSE [11]. In a northern district, 38.2% of women perform monthly BSE, but only 62% know what signs to look for [12].

Geographical and healthcare access challenges hinder breast cancer screening in Sarawak, Malaysia's largest state, with a population of 3 million people from more than 30 ethnic groups. There are only four public mammogram machines, all in major cities. Twenty-five percent of the population lives over 100 km from radiotherapy facilities, and limited awareness, transportation, and financial constraints hinder screening participation [13, 14]. Rural women face unique disparities, with research showing they have higher cancer rates, including cervical cancer [15], and are more vulnerable to cancer disparities [16]. While rural women may exhibit better health behaviors, such as seeking screening, they also face barriers like employment challenges post-treatment [17, 18]. Rurality impacts breast cancer disparities, influenced by travel distance, socioeconomic factors, and healthcare access [19].

Since 2012, local NGOs like the Sarawak Breast Cancer Support Group (SBCSG) have run breast cancer awareness and screening programs across Sarawak. SBCSG has screened 2,050 women, identifying 7.1% with abnormal findings (9.5% among Malays, 8.7% Chinese, 7.5% Bidayuhs). Only 13.7% had prior mammograms. Cultural and spiritual beliefs influence health behaviors, as seen in studies of indigenous populations in Australia [20], the Comanche American Indians [21], and immigrant women in Spain [22]. While prior research addressed general barriers for cancer patients in Sarawak [23], gaps remain in understanding cultural beliefs, stigma, and logistical challenges in rural and indigenous communities. This study explores factors impacting breast cancer awareness and screening among rural Sarawakian women. Understanding these beliefs is critical for improving breast cancer care in Sarawak's diverse ethnic communities.

Materials and Methods

This qualitative study was conducted during outreach programs organised by SBCSG between 10 March 2023 and 9 September 2023. The programs aimed to engage rural communities across Sarawak in breast cancer awareness and screening activities. This study was guided by phenomenology, a framework that focuses on understanding the personal experiences and cultural backgrounds of rural women in relation to breast cancer awareness and screening. Purposive sampling was used to select participants. All participants provided written inform consent prior to each interview. We followed the consolidated criteria for reporting qualitative research guidelines (COREQ) to report the conduct and results of this study [24].

Setting

The study focused on women from four rural, semi-accessible areas of Sarawak, located at least 100km away from the capital city, Kuching: Kampung Buduk Nur (Ba'kelalan), Sungai Kut (Dalat), Rumah Untang (Ulu Yong, Kapit), and Bunan Gega (Tebakang). These sites were chosen to capture a broad spectrum of community perspectives influenced by their unique environments and cultural practices.

The community engagement began by seeking approval from the village chief ('Ketua Kampung') and district healthcare workers to establish trust and rapport with the community for program implementation. Participants were informed about the researchers' academic and professional backgrounds and the purpose of the study, adding its potential benefits for improving breast cancer awareness and care in their communities. Once approval was obtained, the outreach programs were scheduled in the largest community halls to ensure accessibility. The research team stayed in each village for two nights to maximise participant engagement and build rapport. Authors MLSH and FSM participated in these community engagements, facilitating trust-building activities. In areas with district clinics, local healthcare workers, including nurses and medical assistants, were involved to provide additional support for the programs.

Study Participants

Eligibility criteria included women aged 20–70 years who were permanent residents of the selected sites. The socio-demographic characteristics (Age, race, religion, marital status, education level, employment status and monthly household income in ringgit Malaysia, and number of dependents) of study participants are collected. This study was conducted on purposely selected women (n=20) who attended the breast cancer awareness and screening programme. All women approached consented to the interview. Sample size was determined through 'saturation principle', where the researchers observed that no new codes and themes are emerging, the further interviews were ceased by mutual understanding of co-authors.

Data Collection

Semi-structured topic guides were developed based on prior studies [25, 26] and validated by health literacy experts in Sarawak to ensure cultural and contextual relevance. These guides explored cultural beliefs, barriers to breast cancer screening, and participants' personal and community experiences with healthcare. The topic guide questions were mapped to the study objectives to maintain focus and coherence.

The in-depth interviews, lasting approximately 20–30 minutes, were face-to-face in a private but informal setting to encourage participants to share their perspectives freely. The interviews were conducted by the first and second author and a research assistant each contributing specialized expertise. The team included FSM, a professor in Learning Sciences and deputy director at the Institute of Borneo Studies, MLSH, a lecturer with PhD in medical science specializing in cancer, and a research assistant, who has a Master of Science in Counselling and experiences in rural health settings. All three interviewers were female, which facilitated culturally sensitive interactions, given the intimate nature of the subject matter. The researchers

were trained in qualitative research methods and had prior experience conducting interviews in similar cultural and rural contexts.

Bahasa Malaysia, our national language was the language of choice chosen by the respondents, except for NAT, who chose to be interviewed in Bahasa Iban, a native language. Our research assistant, who is a counsellor fluent in Bahasa Malaysia, Bahasa Iban and English, conducted the forward and backward translation between English and Bahasa Malaysia for the interview of all participants. Food incentives were provided to encourage participation. Reflexivity was maintained throughout the data collection process, with interviewers documenting observations and potential biases after each session to ensure neutrality and cultural sensitivity. All interviews were audio-recorded, transcribed verbatim, and translated into English.

Data Analysis

The transcripts were then analyzed using NVivo vs 14 to facilitate systematic thematic analysis. Three authors (MLSH, FSM and NMA) independently coded the transcripts, compare codes and identified sub- and key-themes. This approach ensured consistency and reduced bias. The initial coding categories were created based on the research objectives and topic guide. However, as the analysis progressed, new themes emerged and the coding was adjusted to include these. The research team discussed the themes in depth and refined them through repeated discussions to achieve consensus. The thematic analysis allowed for a detailed exploration of beliefs and barriers, ensuring cultural and linguistic diversity was respected. Common themes across participants' narratives were identified, revealing patterns in symptom appraisal and healthcare-seeking behaviors.

Ethical Approval and Consent

This study was approved by the Human Research Ethics Committee (Non-Medical) (HREC) of Universiti Malaysia Sarawak (HREC(NM)/2023(1)/30). Before data collection, written and oral consent of respondents was taken and the study objectives were briefed to the respondents prior to the interviews. The anonymity and confidentiality of the participants were ensured during data collection and reporting of study findings.

Results

In-depth interviews were conducted with 20 women from four locations in Sarawak. These sites were selected for their geographical diversity to capture varying community perspectives. The median age was 43.4 years (range 20–70 years), with a balanced distribution. Each village contributed 25% of the participants. Most participants (85%) were Christian, with the rest evenly split among Muslim, Buddhist, and those of animist/pagan beliefs. The majority were married (80%). Educational levels varied: 5% had no formal education, 30% completed primary school, 60% secondary school, and 5% held a Malaysian Skills Certificate. Employment status revealed half were homemakers or unemployed, with others self-employed, farmers, or in roles like receptionist and librarian assistant. Most participants (18 out of 20) belonged to households earning less than RM3000 (USD 670), placing them in Malaysia's Below 40 (B40) income group. Detailed description of each participant is shown in Table 1.

Themes in data

We identified five key themes describing the women's local beliefs and perceived barriers and how they affect their awareness and decisions about breast cancer screening and treatments - local myths and beliefs, stigma and taboo, lack of knowledge/awareness, access to healthcare, and interest in learning more.

1. Local myths and beliefs

Nearly all women mentioned using traditional medications, preferring local remedies for disease prevention and treatment, and often choosing traditional methods before seeking conventional breast cancer treatment.

'If the condition is mild, there are villagers here who know how to deal with it.' – SDL

Another participant added that:

'I used to have medicine from Lunbawang from wood which I know only from Lunbawang. I know there is only one. If they eat it, then cancer can't happen, so I heard that. That's the traditional medicine I know.' – JL

All of the five women interviewed at Site 4 mentioned a traditional oil which they believe to be able to cure early-stage breast cancer.

'I never use it. I heard from a friend. But she is not here. She uses traditional medicine. Something like wood leaves, or oil.' – MMS

In rural areas, traditional medicine is predominant, with people often seeking it first before turning to modern healthcare, usually at late stages III or IV. This delay can lead to a belief that conventional treatments are ineffective, fostering a fatalistic view that those with breast cancer are destined to succumb to the disease.

'They use medicine such as oil. They only use the oil to massage it several times. If the condition is getting worse then only they go to the hospital.' – GSH

Another added

'Their belief is that going to the hospital for chemo and radiotherapy is sometimes too harmful.' – ASM

The culture of fatalism is still very strong among those in rural Sarawak. All of the women have a spiritual faith and often turn to God for prayer and strength when they fell sick. When asked about the risk factors of breast cancer, all of the women interviewed did not understand the meaning of 'risk factor' but often related that breast cancer is affiliated with death:

'As far as I know there is a big risk that we could be fatal.' – WMA

'Not sure, I only know that they will die in the end' – GSH

Table 1. Socio-Demographic Characteristics of Study Participants (n=20)

Participant	Site	Site Name	Socio-demographic description
BU	1	Kampung Buduk Nur (Ba'kelalan)	A 36-year-old housewife and mother of 3 of Lun Bawang ethnicity, Christian, with a household income of RM100 (USD23).
JL			A 31-year-old, self-employed contractor and mother of 1, mix-ethnicity of Lun Bawang and Chinese, Christian with a household income of RM6000 (USD1340).
GD			A 70-year-old lady, farmer and mother of 5 of Lun Bawang ethnicity, Christian, with a household income of RM50 (USD11).
DS			A 26-year-old, working for the Malaysia's Volunteer Corps Department (RELA), mother of 1, Christian of Lun Bawang ethnicity and unknown household income.
DL			A 61-year-old lady, farmer and mother of 5 of Lunbawang ethnicity, Christian, with a household income of RM200 (USD45).
RBJ	2	Sungai Kut (Dalat)	A 45-year-old housewife and mother of 4 of Melanau ethnicity, Christian, with a household income of RM1000 (USD224).
GSH			A 52-year-old lady, local grocery owner, divorced and a mother of 1 of Chinese ethnicity, Buddhist with a household income of RM1000 (USD224).
JEK			A 27-year-old housewife and mother of 3 of Melanau ethnicity, Pagan, with a household income of RM1200 (USD268).
WMA			A 47-year-old housewife and mother of 1 of Melanau ethnicity, Muslim with a household income of RM400 (USD89).
SJ			A 32-year-old housewife and mother of 3 of Melanau ethnicity, Christian with unknown household income.
CMK	3	Rumah Untang (Ulu Yong, Kapit)	A 63-year-old widow and mother of 3 of Iban ethnicity, Christian with no household income.
NAR			A 58-year-old housewife with no children of Iban ethnicity, Christian with a household income of RM300 (USD 67).
AZM			A 22-year-old single lady, a receptionist of Iban ethnicity, Christian with a household income of RM1000 (USD224).
LLC			A 52-year-old farmer and mother of 3 of mixed-race (Iban and Chinese), Christian with a household income of RM200 (USD45).
Gl			A 43-year-old housewife and mother of 1 of Iban ethnicity, Christian with unknown household income.
ASM	4	Bunan Gega (Tebakang)	A 48-year-old librarian assistant and mother of 3 of Bidayuh ethnicity, Christian with a household income of RM3000 (USD670).
SDL			A 43-year-old housewife and mother of 2 of Bidayuh ethnicity, Christian with no income.
ED			A 36-year-old housewife and mother of 1 of Bidayuh ethnicity, Christian with no household income.
MMS			A 51-year-old widow and mother of 2 of Bidayuh ethnicity, Christian with a household income of RM300 (USD67).
MEE			A 25-year-old housewife with no children, Bidayuh ethnicity, Christian with unknown household income.

2. Stigma and taboo

Most women are embarrassed to get their breast checkups and hence do not 'open up' when they find abnormalities in their breasts.

'Sometimes they are embarrassed because of their breasts. The villagers don't want to talk. Keep quiet until the condition gets worse. They only go to see a doctor for treatment when the condition gets worse.' – GSH

Many women feel embarrassed about breast abnormalities, as breasts are seen as sexual organs. When diseased, they may lose confidence and hesitate to seek help, often hiding their condition and turning to traditional treatments instead.

'Yes, they think that traditional medicine is more effective. Maybe one of the reason is that they are embarrassed because they are used to it in their village. If they go outside, maybe the doctor is a man, they don't like it.' – GSH

There remains a taboo and stigma around breast cancer in these communities. Many avoid anything associated with the disease due to the belief that it is a death sentence and fear receiving pity from friends and family.

'There are but it's rare for people here. There are some who give support, there are also those who talk behind their backs. Some give support, some talk back. For example, he said this person is not clean enough, this person is not good enough at taking care of their body. That's some of the example.' – BU

3. Lack of knowledge/awareness

Most women had low awareness of breast cancer signs and symptoms. Those without prior experience with breast cancer had no knowledge of it. When a participant from Site 2 was asked about the signs and symptoms of breast cancer, she said

'I know it can cause death' – JEK

Those who had some knowledge of how to do BSE mentioned lumps and pain as signs and symptoms of breast cancer. Most women mentioned that they had learned to do BSE through local clinics and hospitals but did not practice BSE regularly.

'Generally, I know a little bit; it is advised to do it when we shower. The nurses at the clinic here teach us, when we are taking our shower, use soap to do it (BSE).' – ASM

'For me, it's only once or twice a year.' – BU

None of the interviewed women had undergone a mammogram. Most were unaware of mammograms, and those who knew about them felt the screening was irrelevant. One woman couldn't get a mammogram due to family issues (husband was sick), and another faced a broken machine and did not reschedule. These women often prioritized others' health over their own and lacked urgency, likely due to low awareness of the importance of early breast cancer diagnosis.

'Haven't had time to do it yet. Previously, I had registered, but my husband was admitted to the hospital, so it was cancelled.' – RBJ

'At that time, I think I went to Private Hospital A but when I got there the mammogram was broken, so I didn't manage to do it.' – WMA

When asked about what the risk factors are, the women did not appear to be sure but guessed the age of their friends and family who were afflicted with breast cancer.

'There are people aged over 50. There are also 30.' – DL

'As I know, it's 40 years old and over.' – SJ

The lack of knowledge and awareness could be due to the fact that most women were aware of pap smear or the smear test for cervical screening but not BSE and CBE indicating the lack of campaigns and emphasis on the importance of breast screening and early diagnosis.

'There is, there is. A doctor came here. Performed a pap smear test.' – NAT

4. Access to healthcare and financial barriers

Most women from Site 1,2 and 4 reported difficulty accessing healthcare due to transportation issues. In contrast, women from Site 3 noted that transportation is no longer a problem thanks to the Pan-Borneo highway, which replaced the need for express boats used before the highway's construction.

'There is no such thing as before when using boats. Travel by boat is difficult. It takes more than an hour. It takes an hour to arrive at Public Hospital A. It is convenient since there is road access now.' – LLC

Women from Site 1 spent RM300 (USD67) to RM700 (USD155) on transport, while those in Site 2 had to take a boat to the clinic, and women from Site 4 traveled 1.5 hours to Kuching's Sarawak General Hospital (SGH). Most, housewives or farmers with an average income of RM500 (USD112), struggle with transportation and financial constraints. With only four mammogram machines in government facilities, these barriers significantly impede access to breast cancer screening and care.

'There may be difficulties due to the distance, transportation costs, financial, and other expenses. Will need to refer to RTU SGH, right? Ok if we want to do an examination at a private hospital such as Private Hospital A, Private Hospital B or

Private Hospital C will require a large amount of money.' – ASM

Another participant from Site 1 (roughly 800km away from capital city) commented on the challenges indigenous women faced when diagnosed with cancer:

'For people from here, our access to the city is far away. Especially if we are from the clinic here, we will be referred to Clinic A. Sometimes Clinic A even refers us to Public Hospital A. So that's the cost. The cost and the information. Sometimes we are informed late. Sometimes we are having a hard time leaving our children behind. We aren't going for a while, right? If we live in the city, we can go in the morning and return in the evening.' – BU

5. Interest in learning more

All of the women interviewed showed interest in learning about the early signs of breast cancer. To raise awareness among indigenous women, they suggested holding more campaigns, distributing educational materials, and making the content more visual for the illiterate.

'Oh, there are many people here who are illiterate, so please include a demo.' – JEK

'If you can, come see us and give us a brochure. We can learn a lot from brochures, from promotions, advertisements, from watching the news on TV, we get a lot of information. If there's internet access, it is good.' – BU

Other participants added:

'In my opinion, organise more programs like this, or organise it at each village so it will be closer to them.' – SJ

'Expanding the campaign especially in rural areas. Many people do not care about this matter as they take it for granted.' – AZM

When asked about their advice for fellow indigenous women who may be diagnosed with cancer, some are also leaning towards seeing a doctor once they found any abnormalities.

'Take care, follow the doctor's advice. If you are sick, go to the hospital. That's all.' – LLC

Discussion

The cultural beliefs and barriers identified in this study limit breast cancer awareness and early detection in Sarawak's communities. Participants viewed cancer as inevitably fatal, reflecting fatalism that discourages proactive health-seeking behaviors, a finding consistent with previous studies [27, 28]. Traditional medicine also plays a significant role, with most women still using

medicinal oils and herbs as first-line treatments, delaying medical consultations until symptoms become severe. This reliance on traditional remedies mirrors findings in other Indigenous populations where cultural practices shape health behaviors [29, 30]. Integrating traditional medicine with modern healthcare could enhance trust and compliance among rural women. Acknowledging local beliefs while educating communities on modern treatments is key to improving outcomes [30]. This can be achieved through community engagement, training healthcare workers in cultural competence, and involving local leaders in health education campaigns.

The study highlighted the stigma around breast cancer, with respondents feeling embarrassed about breast abnormalities due to their association with sexual organs. This embarrassment often leads to a loss of confidence, reluctance to seek help, and reliance on traditional treatments. Fear of the disease being a death sentence and avoiding pity from loved ones further perpetuate these barriers. Normalizing breast cancer discussions and educating rural communities on early detection and modern treatment are essential. Community-based education and healthcare champions can empower women, while social support from family and friends plays a key role in encouraging medical consultations [31]. However, stigma remains a significant barrier, underscoring the need for strategies that create supportive environments for women to feel comfortable talking freely about their breast health [32].

The study also found a general lack of awareness among rural women in Sarawak regarding breast cancer screening programmes, particularly publicly funded mammograms for the B40 income group [median household income of RM5,249 (USD1173)] per month [33]. Furthermore, participants frequently expressed limited understanding of the importance of mammograms and CBE. This knowledge gap is critical, as early detection through regular screening significantly improves breast cancer prognosis, emphasizing the need to engage local leaders such as Ketua Kampung and collaborate with government entities to raise awareness about these services. Additionally, access to healthcare remains a challenge due to Sarawak's geography and transportation costs. Improving access to oncology services, trained professionals, and deploying more mammogram machines in public hospitals is crucial. Mobile screening clinics are also needed to overcome logistical barriers and increase access to screenings in remote areas.

Notably, there was significant interest among the respondents in learning more about breast cancer and screening practices. During the data collection phase, the respondents were introduced to breast cancer health materials, Know Your Lemons (KYL), which were designed in the USA. Previous studies have highlighted the importance of developing patient-centered resources such as patient information leaflets, posters and videos in local Sarawakian languages [23]. The version presented to the respondents was in the local Bahasa Malaysia language, a language commonly understood and used by. This suggests that health literacy interventions could be effective if they are culturally sensitive and accessible educational materials, such as the Know Your Lemons (KYL) campaign that uses 12 lemons (or limes) to demonstrate the symptoms of breast cancer [34]. The KYL campaign has been translated into various languages and uses mainly friendly graphics for all literacy levels. Health education campaigns like KYL involving local community champions and using local languages and dialects may further enhance their impact. Multistakeholder engagement in breast screening and breast health literacy, particularly in marginalized populations, is crucial to reducing stigma and improving perceptions of breast cancer.

Limitations

This study's sample was comprised of a small number of women from Sarawak, the largest state in Malaysia from four geographical settings – by the sea, by the river, on the mountain and a semi-rural location near the biggest city in Sarawak. Agriculture is their main stead, and all are living in locations far from full-fledged hospital settings. Hence, it was difficult to reflect the findings at a broader level.

Conclusion

In conclusion, beyond breast cancer awareness, access to healthcare and financial limitations, the study highlights the deep-rooted cultural myths and misconceptions surrounding breast cancer among rural women in Sarawak. Despite these barriers, many respondents showed a strong interest in learning about breast screening programs and participating in awareness campaigns. To close the gap in awareness and early detection, we plan to deploy localized health literacy materials tailored to the cultural context of these communities, making information more accessible and relatable. Delivering educational content in Bahasa Malaysia, widely spoken and understood across Sarawak, would further enhance comprehension and comfort for community members. Additionally, creative awareness campaigns, such as the Know Your Lemons initiative, simplifying breast cancer symptoms through visual aids, can help demystify the disease and make discussions easier.

These strategies are designed to encourage breast cancer screening, promote early detection, and educate women on the importance of breast self-examinations. By addressing cultural beliefs and practices, these interventions aim to promote greater understanding, reduce stigma, and ultimately improve breast cancer outcomes among rural populations in Sarawak.

Author Contribution Statement

Melissa Siaw Han Lim and Fitri Suraya Mohamad contributed to the study conception and design. Data collection and analysis were performed by Melissa Siaw Han Lim, Fitri Suraya Mohamad and Nafeesa Mat Ali. The first draft of the manuscript was written by Melissa Siaw Han Lim and all authors commented on subsequent versions of the manuscript. All authors read and approved the final manuscript.

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Ethical Approval

This study was approved by the Human Research Ethnics Committee (Non-Medical) (HREC) of Universiti Malaysia Sarawak (HREC(NM)/2023(1)/30).

Data Availability Statement

All relevant data are within the manuscript and its Supporting Information files.

Conflict of Interest

The authors declare no potential conflict of interest.

References

1. Department of Statistics Malaysia. Statistics on Causes of Death 2019 [Internet]. 2020 [cited June 2024]. Available from: https://newss.statistics.gov.my/newss-portalx/ep/epLogin.seam.
2. Ministry of Health Malaysia. Malaysia National Cancer Registry Report 2012-2016. Report No: MOH/P/IKN/05.19(AR). Putrajaya; 2019.
3. Norsa'adah B, Rampal KG, Rahmah MA, Naing NN, Biswal BM. Diagnosis delay of breast cancer and its associated factors in Malaysian women. BMC Cancer. 2011;11(1):141. https://doi.org/10.1186/1471-2407-11-141.
4. Institute for Public Health 2020, Ministry of Health Malaysia. National Health and Morbidity Survey 2019: Non-communicable diseases, healthcare demand, and health literacy.
Available from: https://iptk.moh.gov.my/images/technical_report/2020/4_Infographic_Booklet_NHMS_2019_-_English.pdf
5. Kim JG, Hong HC, Lee H, Ferrans CE, Kim EM. Cultural beliefs about breast cancer in Vietnamese women. BMC Womens Health. 2019;19(1). https://doi.org/10.1186/s12905-019-0777-3.
6. Tetteh DA, Faulkner SL. Sociocultural Factors and Breast Cancer in Sub-Saharan Africa: Implications for Diagnosis and Management. Women's Health. 2016;12(1):147–56. https://doi.org/10.2217/whe.15.76.
7. Ministry of Health Malaysia, Academy of Medicine Malaysia. Management of Breast Cancer. 3rd ed. Putrajaya: Malaysian Health Technology Assessment Section (MaHTAS); 2019. 1–124.
8. Aidalina M, Syed Mohamed ASJ. The uptake of Mammogram screening in Malaysia and its associated factors: A systematic review. Med J Malaysia. 2018;73(4):202–11.
9. Ministry of Health Malaysia. Annual Report, Ministry of Health Malaysia 2018. Report No: MOH/S/RAN/151.19(AR)-e. Putrajaya; 2019.
10. Akhtari-Zavare M, Juni MH, Ismail IZ, Said SM, Latiff LA. Barriers to breast self examination practice among Malaysian female students: a cross sectional study. Springerplus. 2015;4(1):692. https://doi.org/10.1186/s40064-015-1491-8.
11. Mohan D, Su TT, Donnelly M, Hoe WMK, Schliemann D, Tan MM, et al. Breast Cancer Screening in Semi-Rural Malaysia: Utilisation and Barriers. Int J Environ Res Public Health. 2021;18(23):12293. https://doi.org/10.3390/ijerph182312293.
12. Karim NKA, Law Kim Sooi, Ernest Mangantig. Factors Associated with Breast-self Examination Practice and Mammogram Breast Density among Malaysian Women. Mal J Med Health Sci. 2019;15(SUPP9):96-101.
13. Yahya N, Sukiman NK, Suhaimi NA, Azmi NA, Manan HA. How many roads must a Malaysian walk down? Mapping the accessibility of radiotherapy facilities in Malaysia. PLoS One. 2019;14(3):e0213583. https://doi.org/10.1371/journal.pone.0213583.
14. Galen Centre for Health and Social Policy. White Paper - Cancer Care Challenges, Gaps and Opportunities in Malaysia [Internet]. Kuala Lumpur; 2021 Sep [cited 2024 May 15].
Available from: https://www.phama.org.my/view_file.cfm?fileid=145
15. Yang CM, Sung FC, Hsue CS, Muo CH, Wang SW, Shieh SH. Comparisons of papanicolaou utilization and cervical cancer detection between rural and urban women in taiwan. Int J Environ Res Public Health. 2021;18(1):1–10. https://doi.org/10.3390/ijerph18010149.
16. Molina L, Bustamante F, Ortloff A, Ramos I, Ehrenfeld P, Figueroa CD. Continuous Exposure of Breast Cancer Cells to Tamoxifen Upregulates GPER-1 and Increases Cell Proliferation. Front Endocrinol (Lausanne). 2020;11:563165. https://doi.org/10.3389/fendo.2020.563165.
17. Hurst CP, Promthet S, Rakkapao N. Factors associated with breast cancer awareness in Thai women. Asian Pac J Cancer Prev. 2019;20(6):1825–31. https://doi.org/10.31557/APJCP.2019.20.6.1825.
18. Hallgren E, Ayers BL, Moore R, Purvis RS, McElfish PA, Maraboyina S, et al. Facilitators and barriers to employment for rural women cancer survivors. J Cancer Surviv. 2023;17(5):1338–46. https://doi.org/10.1007/s11764-022-01179-y.
19. Lizarraga IM, Kahl AR, Jacoby E, Charlton ME, Lynch CF, Sugg SL. Impact of age, rurality and distance in predicting contralateral prophylactic mastectomy for breast cancer in a Midwestern state: a population-based study. Breast Cancer Res Treat. 2021;188(1):191–202. https://doi.org/10.1007/s10549-021-06105-x.
20. Shahid S, Bleam R, Bessarab D, Thompson SC. "If you don't believe it, it won't help you": use of bush medicine in treating cancer among Aboriginal people in Western Australia. J Ethnobiol Ethnomed. 2010;6(1):18. https://doi.org/10.1186/1746-4269-6-18.
21. Haozous EA, Eschiti V, Lauderdale J, Hill C, Amos C. Use of the Talking Circle for Comanche Women's Breast Health Education. J Transcult Nurs. 2010;21(4):377–85. https://doi.org/10.1177/1043659609360847.
22. March S, Villalonga B, Sanchez-Contador C, Vidal C, Mascaro A, Bennasar M de L, et al. Barriers to and discourses about breast cancer prevention among immigrant women in Spain: a qualitative study. BMJ Open. 2018;8(11):e021425. https://doi.org/10.1136/bmjopen-2017-021425.
23. Lim MSH, Voon PJ, Ali A, Mohamad FS, Jong LL, Chew LP, et al. Gaps in cancer care in a multi-ethnic population in Sarawak, Borneo: A central referral centre study. PLoS One. 2024;19(7):e0296954. https://doi.org/10.1371/journal.pone.0296954.
24. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349–57. https://doi.org/10.1093/intqhc/mzm042.
25. Solikhah S, Promthet S, Hurst C. Awareness level about breast cancer risk factors, barriers, attitude and breast cancer screening among Indonesian women. Asian Pac J Cancer Prev. 2019;20(3):877–84. https://doi.org/10.31557/

APJCP.2019.20.3.877.
26. Khaliq N, Mustehsan ZH, Rashid H, Khadija S, Waseem N, Waseem H. Knowledge, Attitude, Risk Factors & Screening Practices Regarding Breast Cancer among Women in Islamabad. Pak J Med Health Sci. 2021;15(6):2133–7. https://doi.org/10.53350/pjmhs211562133.
27. Straughan PT. Fatalism Reconceptualized: A Concept to Predict Health Screening Behavior. Journal of Gender, Culture, and Health. 1998;3(2):85–100. https://doi.org/10.1023/A:1023278230797.
28. Remennick L. The Challenge of Early Breast Cancer Detection among Immigrant and Minority Women in Multicultural Societies. Breast J. 2006;12(s1):S103–10. https://doi.org/10.1111/j.1075-122X.2006.00204.x.
29. Mwaka AD, Okello ES, Orach CG. Barriers to biomedical care and use of traditional medicines for treatment of cervical cancer: an exploratory qualitative study in northern Uganda. Eur J Cancer Care (Engl). 2015;24(4):503–13. https://doi.org/10.1111/ecc.12211.
30. Kwame A. Integrating Traditional Medicine and Healing into the Ghanaian Mainstream Health System: Voices From Within. Qual Health Res. 2021;31(10):1847–60. https://doi.org/10.1177/10497323211008849.
31. Kumar P, Ahmad S, Pradhan N, Chaudhary N, Haripriya H, Kumari S, et al. Exploring the Impact of the JEEViKA Swasthya Mitra Helpdesk Intervention on Improving Healthcare Access in Tertiary Healthcare Facilities in Bihar: A Qualitative Descriptive Evaluation; 2024.
32. Cassim S, Chepulis L, Keenan R, Kidd J, Firth M, Lawrenson R. Patient and carer perceived barriers to early presentation and diagnosis of lung cancer: A systematic review. BMC Cancer. 2019;19(25). https://doi.org/10.1186/s12885-018-5169-9.
33. RinggitPlus. DOSM. Average Household Income Increased To RM8,479 In 2022. [Internet]. 2023 [cited 2024 Jun 21]. Available from: https://ringgitplus.com/en/blog/personal-finance-news/dosm-average-household-income-increased-to-rm8479-in-2022.html#:~
34. Know Your Lemons [Internet]. [cited 2024 Jun 21]. Available from: https://www.knowyourlemons.org