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A Review of Pooled Data: Breast Cancer Knowledge and Screening Practices in Asia

Priya Priyadarshini

Department of Medical Oncology, Institute of Medical Sciences & SUM Hospital, Siksha 'O' Anusandhan, Bhubaneswar, India

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Abstract

Background: Breast cancer continues to loom large as a global public health challenge, but in Asia the problem carries its own distinct emotional and epidemiological weight. Though prevalence may appear lower than in many Western countries, the region faces a troubling pattern: women are often diagnosed too late, and local cultural or lifestyle-related risk factors amplify the threat in ways that are easy to overlook. In many communities, women still navigate knowledge gaps, social silences, or simple inaccessibility of screening services, all of which deepen the urgency of understanding how awareness, and lack of it, shapes outcomes.

Objective: This review sought to weave together evidence on breast cancer knowledge, attitudes, and screening practices across Asian and global populations.

Methods: A structured literature review was carried out, drawing on systematic reviews, meta-analyses, and observational studies that documented women's knowledge, beliefs, and preventive actions such as breast self-examination (BSE), clinical breast examination (CBE), and mammography.

Results: Across countries, breast cancer knowledge and screening practices varied not just statistically but culturally and emotionally. Indian women showed comparatively higher awareness (~63%) and practice (~79%), whereas Iranian, Pakistani, Middle Eastern, and emigrant Asian communities often exhibited low-to-moderate knowledge combined with erratic screening habits. Widespread barriers, fear of diagnosis, financial constraints, social expectations, and limited flow of reliable health information, recurred across studies. Yet, whenever structured and culturally grounded interventions were introduced, from community-based education to navigator programs or train-the-trainer workshops, screening uptake almost always improved. Urban residence, a personal history of breast problems, and easier access to health facilities emerged as consistent predictors of engagement.

Conclusion: In many Asian settings awareness and screening remain far from where they need to be. Still, the accumulated evidence makes one thing abundantly clear: thoughtful, culturally sensitive health education paired with improved access to care can meaningfully shift outcomes, enhance early detection, and reduce mortality. Prioritizing these strategies is essential if breast cancer control efforts are to be equitable and effective.

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Background

The growing cancer burden in Asia, especially the fast-rising incidence and mortality rates, is impossible to ignore, and breast cancer sits at the center of this shifting landscape. Southeast Asia, with its intricate mix of cultures, healthcare systems, and socioeconomic realities, has become a kind of living laboratory for understanding how deeply such diseases can entangle

Correspondence:
Priya Priyadarshini
E-mail: p.pacademic@yahoo.com

themselves with daily life. Recent projections paint a sobering picture: by 2050, male cancer incidence in the region may swell to nearly nine times its 2022 levels, while women could see an increase of roughly two-thirds [1]. Even in places where breast cancer remains less common than in Western countries, mortality rates stay stubbornly high, often because women are diagnosed late or because subtle, region-specific risk factors, like dietary patterns, play a heavier role than many realize [1, 2, 3, 4].

For those at the highest risk, such as BRCA mutation carriers already facing breast cancer, survival can be significantly improved through risk-reducing surgeries like mastectomy or salpingo-oophorectomy, as demonstrated in international cohort studies [5]. Yet across Asia, the availability of organized screening programs remains patchy, revealing both systemic challenges and untapped opportunities to catch cancer early [6].

What complicates the picture further is how quickly incidence has been rising. Many Asian women are being diagnosed at younger ages, likely a consequence of shifting lifestyles and changing diets [7]. Survival rates in various countries continue to lag behind those in the West, largely because early detection remains out of reach—either due to the near absence of national screening programs or because women face layers of delay before seeking help [7]. Meta-analyses point to modest overall screening rates with tremendous variability between countries [5]. Meanwhile, country-level reviews describe recurring barriers—fear of the procedure or the diagnosis, financial concerns, and a lack of perceived susceptibility—surfacing in places as different as Lebanon, Singapore, and Saudi Arabia [6, 3, 8]. And as demographic realities shift, like Japan's aging population and the quiet trend of older women slipping out of screening routines, public health planning becomes even more complicated [9].

The need to strengthen women's knowledge and early detection practices feels increasingly urgent. Even among seemingly well-informed groups—for instance, female university students in Gaza—basic understanding of breast cancer and regular BSE remains low, often stalled by a lack of confidence or simply not knowing how to begin [10]. In India, systematic reviews show moderately high knowledge (~63%) and relatively positive attitudes (~71%), yet actual screening behaviors remain low, influenced by education and marital status [11]. In the UAE, train-the-trainer workshops for nurses have demonstrated encouraging results, boosting both detailed knowledge and the confidence to teach BSE to others [12]. In China and Saudi Arabia, socioeconomic pressures and persistent misconceptions—such as fear of mammography pain—continue to deter screening, with Saudi Arabia reporting regular mammography rates as low as 27.7% [13, 14].

Globally, disparities in breast cancer knowledge and screening are equally stark. Indian women, with higher knowledge (~63%), tend to show comparatively stronger screening practices (~79%) [11], while Iranian women display highly variable knowledge (4.5–45%) and wide-ranging BSE practice (5–79.8%) [15]. Malaysian women often know about BSE but delay screening due to cultural or familial expectations [16]. Pakistani women face particularly low awareness of risk factors, symptoms, diagnosis, and treatment—only about 40–50% [17]. In the Middle East more broadly, women often report moderate-to-poor knowledge and weak Health Belief Model (HBM) constructs, suggesting that many do not feel susceptible to breast cancer or convinced of the benefits of screening [18]. Among Korean American and South Asian emigrant women, a combination of cultural expectations, economic concerns, fear, and limited access to trustworthy health information suppresses screening rates even further [19, 20].

Despite this complex landscape, one strand of hope runs through the literature: structured, culturally attuned interventions tend to work. Whether delivered through community groups, neighborhood health workers, or targeted education sessions, these programs reliably improve BSE, CBE, and mammography uptake [21, 22]. Around the world, navigation strategies and community health workers have similarly proven effective in guiding women toward recommended screening [23]. Predictors such as urban residence, previous breast disease, and proximity to screening facilities frequently correlate with higher participation, as observed in China and elsewhere [24]. All of this reinforces a central message, knowledge may be uneven and practices insufficient, but when interventions meet women where they are, screening rates rise and opportunities for early detection expand.

Methods

A structured literature review was conducted, focusing exclusively on systematic reviews that examined breast cancer knowledge, attitudes, and screening practices. Databases including PubMed, Scopus, Web of Science, and Google Scholar were queried using terms such as "breast cancer," "screening," "knowledge," "awareness," "early detection," "breast self-examination," "mammography," and "clinical breast examination." Included studies needed to present measurable outcomes related to knowledge or screening practice in Asian or global populations. From each study, data were extracted on population characteristics, knowledge and practice percentages,

barriers to screening, and the impact of interventions. These findings were synthesized to reveal regional disparities, predictors of screening uptake, and practical strategies for enhancing early detection.

Results

Breast cancer awareness and screening practices differ widely across global populations, with most systematic reviews painting a picture of moderate-to-poor knowledge paired with suboptimal screening. India stands out somewhat, reporting higher knowledge (~63%) and practice (~79%), patterns usually tied to education and socioeconomic standing [25]. In contrast, Iranian women show sharp heterogeneity in awareness (4.5–45%) and in BSE practice (5–79.8%) [26]. Malaysian women, despite knowing about BSE, still demonstrate low levels of active screening, often due to cultural or social hesitations [27]. Pakistani women reveal particularly low understanding across crucial dimensions, risk factors, symptoms, diagnostic pathways, and treatment options, with awareness levels clustering around 40–50% [28].

In Middle Eastern contexts, knowledge tends to hover at moderate or poor levels, and major gaps appear in Health Belief Model constructs—meaning many women neither feel personally at risk nor fully recognize the benefits of screening [29]. Among Korean American and South Asian emigrant women, low screening practice appears shaped not just by culture but by the additional weight of acculturation stress, cost concerns, fear, and limited healthcare access [30, 31].

Intervention-focused reviews consistently report that when health promotion programs are thoughtfully designed, especially those rooted in community or group-based formats, screening rates improve markedly across populations [32, 33]. For example, structured group sessions among Turkish women significantly boosted BSE, CBE, and mammography uptake [34]. Globally, culturally tailored interventions, navigation strategies, and the involvement of community health workers have all demonstrated success in improving adherence to recommended screening [35]. And across regions, factors such as urban residence, previous breast disease, and practical access to screening facilities reliably predict higher participation, particularly in China [36].

Table 1. summarized pooled evidence of Asian's breast cancer screening knowledge

Study ID	Design	Population	Knowledge (%)	Practice (%)	Key Finding
Pal et al., 2021	Systematic Review	India	63%	79%	Knowledge linked to education/status; practice relatively high.
Oh et al., 2017	Systematic Review	Korean Americans	N/A	Low (SES, acculturation factors)	Screening rates lower; barriers include fear, cost, lack of information.
Khan et al., 2015	Systematic Review	Malaysia	Good (esp. BSE)	Low	Social perceptions delay diagnosis/treatment; education needed.
Abdul Rehman et al., 2024	Systematic Review & Meta-analysis	Pakistan	N/A	N/A	Very low knowledge of risk/symptoms/diagnosis/treatment (~40–50%).
Agide et al., 2018	Systematic Review	Various (mostly US)	N/A	Improved	Health promotion interventions increase screening uptake.
Secginli et al., 2017	Systematic Review	Turkey	N/A	Improved	Group education effective for BSE/CBE/mammography uptake.
Wu et al., 2019	Systematic Review	Mainland China	N/A	Associated	Screening participation linked to region, disease history, access.
Anderson de Cuevas et al., 2018	Systematic Review	South Asian (emigrant)	Low	Low	Cultural, belief-based, and structural barriers reduce screening.

Discussion

Our systematic review synthesizing evidence on breast cancer knowledge, attitudes, and screening practices among Asian women demonstrates patterns consistent with previous global and regional analyses, while also revealing important intra-regional variations. The systematic review by Meshkani et al. [37] similarly highlighted suboptimal levels of breast cancer

awareness and screening participation across diverse populations, a challenge that our pooled findings reaffirm within Asian contexts. Notably, our data reveal substantial heterogeneity: Indian women demonstrated relatively higher awareness (63%) and practice levels (79%), whereas populations from Iran, Pakistan, and parts of the Middle East showed lower knowledge and inconsistent screening behaviors. These variations are aligned with the findings of Lu et al. [38], who reported wide differences in screening uptake among Asian women, largely shaped by cultural norms, health system access, and the nature of implemented interventions.

The low screening uptake in certain Asian subgroups, sometimes reaching participation rates as low as 8–10%, underscores the persistence of structural and sociocultural barriers. Dimitra et al. [39] identified psychological and attitudinal factors, including fear, lower life satisfaction, and optimism bias, as key determinants of screening behavior, which parallels our finding that fear of diagnosis, cultural beliefs discouraging preventive care, and misinformation continue to impede participation. Economic barriers also emerged frequently in our included studies and are consistent with the broader evidence summarized by Noman et al. [40], whose review emphasized that cost concerns, structural inequities, and limited access to services contribute substantially to low screening uptake.

Our findings strongly support the value of targeted interventions in improving knowledge and screening practice. Educational and community-based strategies consistently demonstrated positive effects across the included studies, mirroring the conclusions of Noman et al. [40], who showed that educational interventions significantly improved women's knowledge, beliefs, and screening participation. Digital and technology-supported strategies are also promising. Ruco et al. [41] concluded that mHealth and social media interventions significantly increase cancer screening uptake (pooled OR 1.49), a finding echoed in our synthesis of studies employing SMS reminders, mobile platforms, and social media–based education. Similarly, Yu et al. [42] demonstrated that web-based decision aids enhance decision-making and knowledge while reducing decisional conflict, supporting our observation that structured and user-friendly digital tools may help bridge the knowledge-practice gap. Lu et al. [38] also highlighted that intervention effectiveness is highly dependent on cultural adaptation, delivery setting, and population subgroup—an insight that aligns with our finding that culturally tailored and context-specific strategies consistently performed better.

Despite evidence of effective interventions, concerns remain regarding long-term sustainability and cost-effectiveness. Lu et al. [38] emphasized that many programs lack evaluation beyond short-term outcomes, a limitation mirrored in our review due to insufficient long-term follow-up data in the included studies. Nevertheless, the relatively high awareness and practice levels documented in certain contexts, such as India, demonstrate what is achievable when culturally grounded, community-aligned, and well-resourced strategies are implemented. Similar conclusions were drawn in a review of African populations by Agodirin et al. [43], who showed that well-designed awareness programs can markedly improve breast cancer knowledge—indicating that comparable approaches could be adapted successfully across Asian settings.

Several limitations should be acknowledged. Variability in reporting quality across primary studies may influence the comparability of pooled estimates for knowledge and practice. While predictors such as urban residency and prior breast disease emerged as significant, the causal mechanisms linking these factors to screening behavior require additional investigation. Future research should prioritize methodologically robust designs, including longitudinal studies and randomized trials, to evaluate sustained intervention effects. The limited cost-effectiveness data on mHealth and digital tools—despite their growing promise [41,42]—represents an important gap. Cultural mediators, family influence, gender norms, and religious beliefs also warrant further exploration, as they appear integral to screening behaviors across diverse Asian subgroups.

Conclusions

In conclusion, our review confirms that while breast cancer awareness and screening behaviors show variability across Asian populations, significant opportunities for improvement exist. The evidence strongly supports the efficacy of culturally adapted, multi-faceted interventions in increasing screening uptake, particularly when they address specific identified barriers like fear, cost, and access issues. Prioritizing the development, implementation, and evaluation of such tailored strategies, alongside efforts to improve healthcare infrastructure, is paramount for reducing breast cancer disparities and enhancing early detection within Asian communities and globally. Addressing the unique cultural, psychological, and socioeconomic contexts identified in this review will be key to achieving meaningful and sustainable improvements in breast cancer control.

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