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# Facilitators and Barriers to Cancer Screening Participation Across Southeast Asia: A Scoping Review

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## ABSTRACT

**Objective:** As the prevalence of cancer cases in Southeast Asia (SEA) increases, understanding facilitators and barriers to participation in and uptake of cancer screening is important. However, to date, no review has been undertaken on this topic. This review aimed to address this knowledge gap.

**Methods:** The search was conducted across academic databases and grey literature sources. Two reviewers independently screened the results, followed by data extraction. Social cognitive theory was used as part of narrative synthesis of the data.

**Results:** Of the 735 studies, 26 were included. Barriers and facilitators were grouped into headings of personal, environmental, societal, and behavioural domains. The commonly reported barriers to participation in cancer screening included poor knowledge, emotional factors, belief of low personal susceptibility, lack of time, misperceptions, cost, inconvenience, social influence, and lack of skills required. The facilitators were education, greater self-perceived risk, reassurance, past medical history, reduced cost and improved access to healthcare, social supports, religious beliefs, and routine health check-ups.

**Conclusions:** A multitude of barriers, and some facilitators, to participation in cancer screening were reported in the literature. This complexity highlights the importance of a multifaceted and nuanced strategy in promoting cancer screening in SEA countries.

## 1 | Background

Cancer is a disease that involves the uncontrollable growth and division of abnormal cells, a process that can begin in nearly any part of the body and eventually spread throughout [1]. It is one of the leading causes of death globally with the impacts felt not only at an individual level, but by families, communities and the health care system, which is placed under enormous pressure [2].

The South-East Asia (SEA) region encompasses countries such as Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore,

Thailand, Timor-Leste and Vietnam [3]. According to WHO [4], the number of new cancer cases in SEA was reported at over 2 million, with nearly 1.5 million deaths due to cancer in 2020. Cancer contributes to 21% of deaths as a result of non-communicable diseases (NCD) and 7.8% of all deaths in SEA, with cancer mortality predicted to increase by 4 million cases over the next 2 decades [2].

The ASEAN Costs In Oncology (ACTION) study group [5] revealed the disastrous health and financial effects of a cancer diagnosis, with over 75% of patients experiencing financial catastrophe or experiencing death within 1 year of diagnosis. A year after diagnosis, 48% of patients had experienced financial

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catastrophe, 29% of patients died, and only 23% survived with no financial catastrophe [5]. Cancer has numerous modifiable risk factors, including alcohol consumption, tobacco use, physical inactivity, unhealthy diet and air pollution. These lifestyle and environmental risk factors are increasing within SEA cultures, with low to middle income countries particularly affected by these issues [2].

Cancer screening tests are essential for early detection of cancer and/or its precursor lesions [6]. Early cancer screening has been shown to effectively decrease cancer incidence or mortality [7]. However, cancer-related figures for SEA and current literature demonstrate an overall low participation rate in cancer screening participation in SEA populations [8–10]. Preliminary research highlighted the disparity of cancer screening rates between different SEA countries and within specific SEA populations. As a result of underdeveloped health systems and maldistribution of healthcare, SEA have inadequate primary NCD prevention and health promotion interventions [2]. The disparity in economic, social, cultural, and political conditions in SEA contributes to the disparities in health status and healthcare systems [11]. Higher income countries such as Brunei, Singapore and Thailand have achieved higher cancer screening participation rates when compared to lower-middle income countries including Cambodia, Laos and Myanmar, which have a more limited access to screening services, particularly in rural areas [12].

Limited health literacy has also been reported across SEA, with poor health literacy in 55.3% of the population [13]. Low education levels are associated with reduced knowledge of health protection, health-promoting lifestyles and seeking appropriate healthcare, hence contributing to the low screening participation rates [2]. Facilitators identified were that SEA women who were older and were advised by health care workers went to get screened more for cervical cancer when compared to women who were not [12]. Saputra et al. [14] noted SEA women with secondary and higher education were 1.8 times more likely to access cervical cancer screening highlighting the importance of education in influencing participation rates.

As SEA is a growing region, in terms of population and influence, to date, there has been limited research on barriers and facilitators to participation in cancer screening within this population group, despite its unique social and cultural aspects. This review aimed to address this knowledge gap.

## 2 | Methods

A protocol for this scoping review was developed apriori and registered with Open Science Framework (<https://osf.io/vhzda/>).

### 2.1 | Search Strategy

The search strategy was developed by the authors for MEDLINE (1966–2022), and then appropriately modified for use in other databases including Embase (1947–2022), Emcare (1995–2022)

and the Cochrane Library (1993–2022). A detailed search strategy for each database can be found in Supporting Information S1: Appendix I. Grey literature was searched via Google scholar, Google search engine (up to the first 10 pages) and the International Clinical Trials Registry Platform (ICTRP). Pearling of included studies was also undertaken. No limitations were applied to publication date (range of years), or the age or gender of participants but English language and human limiters were used. All literature searches were conducted between 7 March and 10 March 2022. This search was updated on 8 December 2024.

### 2.2 | Study Selection

Table 1 provides an overview of inclusion and exclusion criteria.

### 2.3 | Screening

Included databases were thoroughly searched by two authors (J. L., E.S.). Retrieved studies were uploaded to Endnote followed by Covidence for the screening process. The two reviewers independently completed title and abstract screening, followed by full text screening. Any conflicts of opinion or disagreements between the two screeners were settled by discussion with an independent third reviewer (E.S.).

### 2.4 | Data Extraction

A customised data extraction form was developed for this review (Supporting Information S1: Appendix II). This form was tested by two reviewers (T.L., B.S.) using one of the included articles, to ensure it contained all relevant items. Items included in this form were author, study design, country, population (age range, gender), sample size, types of cancer, barriers addressed, facilitators addressed and results/statistics within the studies. All data were extracted by two reviewers, with a third (I.H.) verifying all collated information and resolving any disagreements.

### 2.5 | Data Synthesis

Given the nature of the review question, a narrative synthesis of the literature was undertaken using Social Cognitive Theory (SCT). The SCT is derived from the Social Learning Theory and highlights that there is reciprocal determinism between people and the environments that they live, work, and play in [15]. There is an emphasis on the interplay between personal cognitive factors, environment and human behaviour [16]. The SCT was chosen as the overarching framework for this review as it uses a holistic lens to explore and understand human behaviour. Using SCT also meant identifying and mapping enabling strategies against specific barriers which may promote behaviour change. By doing so, we were able to categorise barriers and facilitators into *Personal Cognitive*, *Environmental*, *Social Influence* and *Behavioural* factors. While there are other health promotion theories such as the Health Belief Theory or Theory of Planned Behaviour [17, 18], SCT provides the

**TABLE 1** | Inclusion and exclusion criteria.

	Population	Concept	Context	Studies
Inclusion	Adults (aged above 18 years old)	Studies exploring the barrier and facilitator to cancer screening participation	Cancer screening	Human English
		Knowledge and attitudes towards cancer screening	Residents in southeast asia	Quantitative and qualitative studies Both published and unpublished studies
Exclusion	Children (aged below 18 years old)	Studies examining the effectiveness of cancer screening methods and efficacy of cancer screening intervention	Other health screening	Non-English
		Studies that measured association between cancer screening and factors (e.g., demographic variables, comorbidities, or socioeconomic status)	Health checks	Animal
		Studies that do not have a primary objective on exploring barriers and facilitators	All countries not included in SEA People of SEA origin living in other countries	Opinion pieces, discussion paper

opportunity to address all factors for cancer screening uptake found in this scoping review.

### 3 | Results

#### 3.1 | Search Results

As shown in Figure 1, search of the literature yielded 735 studies for title and abstract screening. Of these, 689 were excluded and 46 studies were screened in full text for eligibility against the inclusion and exclusion criteria. During this process, 20 studies were excluded due to the following reasons: measures association between factors (e.g., demographic variables, socioeconomic status) and cancer screening ( $n = 9$ ), full text unavailable ( $n = 1$ ), wrong intervention ( $n = 2$ ), wrong population ( $n = 1$ ) and wrong outcomes ( $n = 1$ ).

#### 3.2 | Study Characteristics

The 26 included studies were published between 1995 and 2023 [19–23]. Majority of the studies were conducted in Malaysia ( $n = 12$ ; 46.15%) [8, 15, 20, 24–32] followed by Singapore ( $n = 9$ ; 34.62%) [9, 21, 22, 33–38], two in Thailand [10, 23], two in Indonesia [19, 39] and one in Vietnam [40]. The sample size range of the studies varied between 25 participants [19, 28] and 1905 participants [15].

The study designs were as follows: cross sectional study ( $n = 15$ ; 57.69%) [8, 10, 15, 20, 21, 25–27, 29, 31, 32, 36–39], qualitative study ( $n = 6$ ; 23.08%) [19, 22, 23, 28, 35, 40], mixed method explanatory ( $n = 4$ , 15.38%) [9, 24, 33, 34], and prospective cohort study ( $n = 1$ ; 3.85%) [30]. Majority of the studies investigated female population aged 40 years and above [9, 24, 26, 28, 29, 31, 33, 36]. The cancers in the studies explored were: breast

( $n = 14$ , 53.85%) [8, 9, 19, 22–25, 29, 31, 33, 34, 36, 37, 39], colorectal ( $n = 9$ , 34.62%) [8, 15, 27, 28, 30, 32, 35, 37, 38], and cervical ( $n = 6$ , 23.08%) [9, 10, 21, 22, 37, 40] with some studies looking at multiple cancers. Table 2 provides an overview of the characteristics of the studies included.

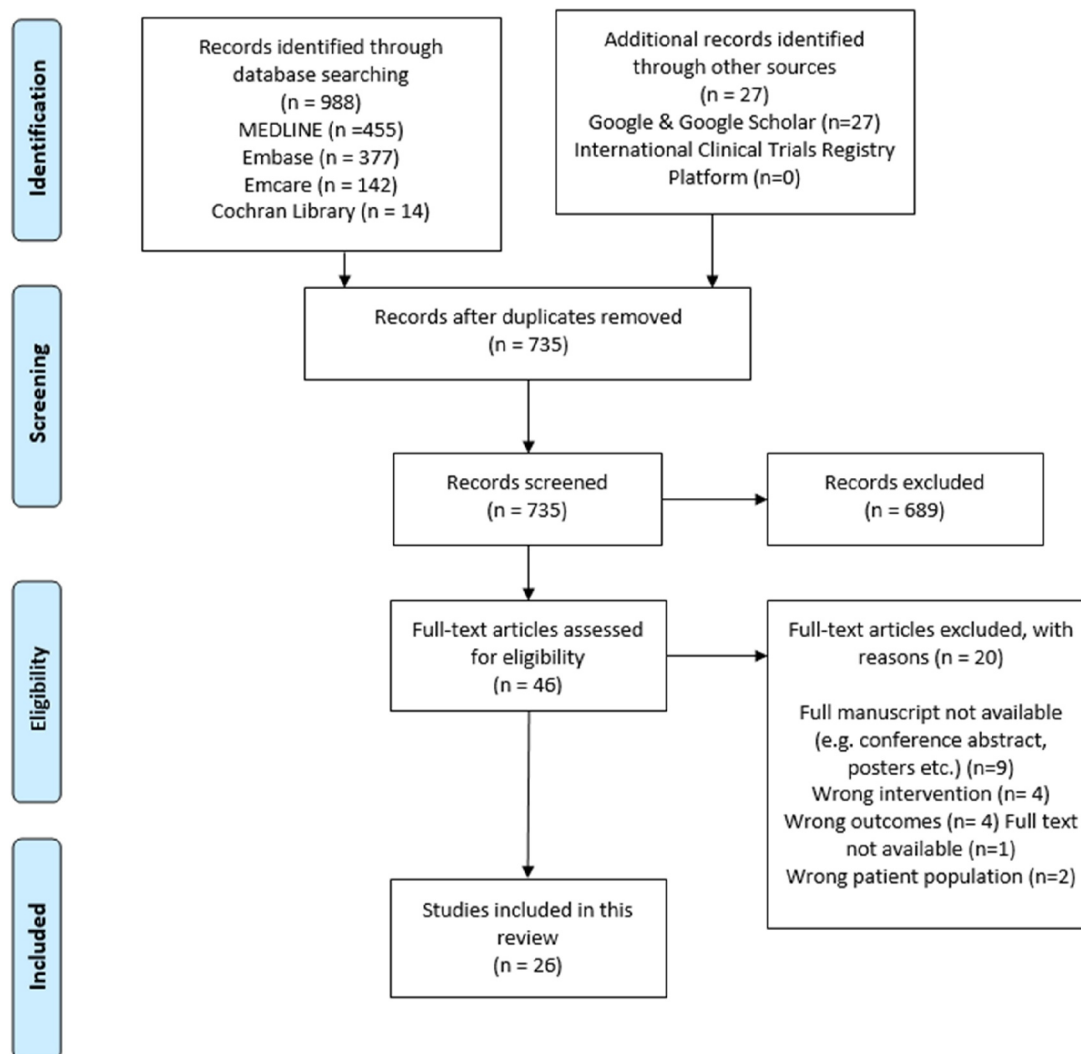
#### 3.2.1 | Description of Barriers Addressed

Barriers to cancer screening in SEA were addressed in all 26 studies [8–10, 15, 19–31, 33–37, 39, 40]. These focused on personal cognitive, environmental, social and/or behavioural barriers. Some barriers were relative to a particular type of cancer whilst others were manifested more generally.

#### 3.2.2 | Personal Cognitive Factors

Poor knowledge of cancer screening proved to be a key barrier and was explored by 13 studies [8, 15, 19, 20, 26–28, 30, 32, 34, 37, 39, 40]. There was a deficit of knowledge around risk factors, signs and symptoms, and screening methods [15, 19, 30, 39]. Being unaware of the practical details of cancer screening such as the location and time for screening or the zero cost and government clinic availability was also a barrier [10, 27].

Misperceptions of breast cancer screening was explored by three studies [9, 25, 36]. Misperception of breast cancer screening as ineffective and unimportant was discussed by Al-Dubai et al. [25] with further misperception surrounding mammograms being harmful to one's breasts was explored by Malhotra et al. [9]. Teo et al. [36] reported that misperception that having an absent family history of breast cancer meant regular mammograms were not required, and that having a prior clear mammogram meant no further screening was required.



**FIGURE 1** | PRISMA flow diagram.

Belief of low personal susceptibility was a factor identified as a barrier in 10 studies [2, 7, 9, 10, 16, 20, 21, 25, 27, 29, 33, 34, 38, 40, 41]. Low personal susceptibility was evident in these studies due to no family concerns, the feeling of being low risk and being asymptomatic. Wongwatcharanukul et al. [10] further explored the belief of low personal susceptibility of cervical cancer from never having sexual intercourse.

Emotional factors could impact uptake of cancer screening and are a current barrier in SEA. Embarrassment is a major response to cancer screening as reported in eight studies [8, 10, 21, 24, 25, 28, 31, 32]. Embarrassment concerning male technicians was specified by Abdullah et al. [24]. Fear was another emotion felt towards cancer screening and was referred to in 11 studies [8–10, 21, 24, 25, 29, 31, 32, 35, 36]. All presented fear of a positive diagnosis whilst fear of pain was reported by Al-Naggar and Bobryshev [26], Doraimuthu et al. [28], Hassan et al. [29], and Wongwatcharanukul et al. [10]. These studies also highlighted unpleasantness and discomfort as apparent emotions. Specifically for breast cancer Mohan et al. [31] explored the fear of losing a breast and Teo et al. [36] explored the fear of radiation during a mammogram.

### 3.2.3 | Environmental Factors

Environmental factors also play a significant role in participation in cancer screening across SEA. A lack of time, or the opinion of cancer screening to be time-consuming, was identified by nine studies [10, 20, 23, 25, 27, 32, 34, 36, 38]. Teo et al. [36] addressed this time issue as being due to work, family or other commitments.

Cost proved to be a barrier in 11 studies [20, 27, 29, 31–37, 40]. Dau et al. [40], Goh et al. [33], Hassan et al. [29], Liow et al. [34], Nyanti et al. [20], Tan et al. [35], Teo et al. [36], Wee et al. [37], and Yusoff et al. [32] discussed the cost barrier to be specific to the cost of the tests, such as a mammogram, whilst Dau et al. [40], Mohan et al. [31], and Nyanti et al. [20] addressed the cost following receiving a diagnosis to be a barrier. Bujang et al. [27] identified a lack of health insurance for some also, which was an addition to cost as a barrier.

Inconvenience was addressed by five studies [9, 10, 33, 35, 38]. Malhotra et al. [9] highlighted the inconvenience of travel, alongside Wongwatcharanukul et al. [10], and expanded upon

**TABLE 2** | Characteristics of studies included.

Author (year)	Study design/ methodology utilised	Country	Participant sample size (n)	Cancer types	Barriers addressed	Facilitators addressed
Abdullah et al. (2011) [24]	Mixed method Focus group + questionnaire	Malaysia	Females aged > 40 years (n = 534)	Breast cancer	<i>Personal factors</i> Negative perceptions towards the procedure (embarrassment, low confidence, anticipated pain and procedural side effect)	<i>Social factors</i> Physician's recommendation
Al-Dubai et al. (2012) [25]	Cross sectional study Questionnaire	Malaysia	Malaysian females aged 18 years or more living in an urban setting in shah alam (n = 222)	Breast cancer	<i>Personal factors</i> Fear, embarrassment, unpleasant, low susceptibility, lack of knowledge <i>Social factors</i> Shouldn't touch bodies <i>Environmental factors</i> Time consuming <i>Behavioural factors</i> Don't know how to perform BSE	Not reported
Al-Naggar et al. (2015) [8]	Cross sectional study Questionnaire	Malaysia	Patients from Umra private hospital (n = 187)	Colorectal cancer (CRC)	<i>Personal factors</i> Fear, embarrassment, lack of knowledge	<i>Social Factors</i> Doctor's recommendation
Al-Naggar & Bobryshev (2012) [26]	Cross-sectional Questionnaire	Malaysia	Females aged > 40 years (n = 20)	Breast cancer	<i>Personal factors</i> Lack of knowledge, fear of the test results <i>Environmental factors</i> Lack of time	<i>Personal factors</i> To detect breast cancer View screening as something very necessary
Bujang et al. (2021) [27]	Cross-sectional study Questionnaire	Malaysia	Age > 50 years (median age = 61 years), asymptomatic of colorectal cancer, with no family history of colorectal cancer (n = 508)	Colorectal cancer (CRC)	<i>Personal factors</i> Low perceived susceptibility to CRC, negative perception towards iFOBT (require to handle stool, embarrassing, harmful/painful procedure, screening process is dirty), lack of knowledge	<i>Personal factors</i> Good knowledge of risk factors, perceived susceptibility <i>Social factors</i> Recommendation from physicians

(Continues)

TABLE 2 | (Continued)

Author (year)	Study design/ methodology utilised	Country	Participant sample size ( <i>n</i> )	Cancer types	Barriers addressed	Facilitators addressed
Dau et al. (2022) [40]	Qualitative study Focus group	Vietnam	Females aged > 21 years old ( <i>n</i> = 155)	Cervical cancer	<i>Social factors</i> Lack of recommendation from doctors, preferred to wait for their doctor's recommendations	
					<i>Environmental factors</i> Lack health insurance with coverage for screening, time- consuming	
					<i>Behavioural factors</i> Lack of knowledge of the test	
					<i>Personal factors</i> Lack of knowledge, false beliefs that it only affects older women	<i>Personal factors</i> Cervical cancer can be prevented and treated
					<i>Social factors</i> Lack of confidence in medical staff	<i>Social factors</i> Family history of cervical cancer, encouragement from the authorities and medical professionals
					<i>Environmental factors</i> Cost, insufficient supply of medical facilities and services, inappropriate information about the availability of screening services	
Doraimuthu et al. (2023) [28]	Qualitative study Interview	Malaysia	General population, health care providers, and policymakers aged between 41 and 66 years with no previous history or current diagnosis of	Colorectal cancer (CRC)	<i>Personal factors</i> <i>Embarrassment, fear of pain, fear of knowing, lack of knowledge and awareness</i>	<i>Social factors</i> Family history of cancer, family support
					<i>Social factors</i> <i>Lack of physicians' recommendation</i>	

(Continues)

TABLE 2 | (Continued)

Author (year)	Study design/ methodology utilised	Country	Participant sample size (n)	Cancer types	Barriers addressed	Facilitators addressed
Goh et al. (2022) [33]	Mixed method Interview + survey	Singapore	any form of cancer (n = 25)  Malay-muslim females aged 40–69 years (n = 23 interviewed, n = 271 in survey)	Breast cancer	<i>Environmental factors</i>  <i>Lack of CRC-related campaigns</i>  <i>Personal factors</i> Perceived low susceptibility, perceived negative outcomes from mammography  <i>Social factors</i> Religious beliefs (fatalism), distrust in doctors  <i>Environmental factors</i> Inconvenience, cost, misinformation on mammogram triggering cancer cells	<i>Personal factors</i> Perceived benefits of saving lives, personal responsibility, perceived susceptibility to breast cancer  <i>Social factors</i> Reminders from doctors and husbands, support from family  <i>Environmental factors</i>
Harmy et al. (2011) [15]	Cross sectional study Questionnaire	Malaysia	Adults aged > 50 years old and asymptomatic for colorectal cancer (n = 1905)	Colorectal cancer (CRC)	<i>Personal factors</i> Lack of knowledge, poor attitude towards screening	Not reported
Hassan et al. (2015) [29]	Cross sectional study Questionnaire	Malaysia	Females aged 40–74 years (n = 1619)	Breast cancer	<i>Personal factors</i> Low perceived susceptibility, fear  <i>Environmental factors</i> Cost	Not reported
Hilmi et al. (2010) [30]	Prospective cohort study Interview	Malaysia	Friends and relatives accompanying patients to the general medical clinic in the University of malaya medical centre (n = 991)	Colorectal cancer (CRC)	<i>Personal factors</i> Lack of knowledge	Not reported
Icanervilia et al. (2023) [19]	Qualitative study Interview	Indonesia	Breast cancer patients and their relatives, health care	Breast cancer	<i>Personal</i>	Not reported

(Continues)

TABLE 2 | (Continued)

Author (year)	Study design/ methodology utilised	Country	Participant sample size (n)	Cancer types	Barriers addressed	Facilitators addressed
Liow et al. (2022) [34]	Mixed methods analysis Focus group + surveys	Singapore	Females (aged between 21 and 59 years who had no prior history of breast cancer) (n = 54 in focus group) (n = 994 in survey)	Breast cancer	Limited community knowledge about early detection and lack of urgency to seek medical treatment <i>Social factors</i> Inconsistent adherence among health care professionals to guidelines for both screening and diagnostic procedures <i>Environmental factors</i> Limited access to health facilities <i>Personal</i> Lack of knowledge, pain, pessimism towards diagnosis, perceived low risk <i>Environmental factors</i> Cost and lack of time	<i>Personal</i> Having a peace of mind <i>Social</i> Family history of cancer
Malhotra et al. (2016) [9]	Mixed methods analysis Focus group + surveys	Singapore	Females; breast cancer screening— 40–65 years, cervical cancer screening— 25–65 years (n = 64 in focus group; n = 810 in survey)	Breast and cervical cancers	<i>Personal factors</i> Fear, lack of knowledge, negative, perception of the test, low perceived susceptibility, don't want to know diagnosis <i>Social factors</i> Belief in fatalism, previous bad experience from family/peers <i>Environmental factors</i> Inconvenience <i>Personal factors</i> Fear, pain/discomfort, embarrassment <i>Social factors</i>	<i>Social factors</i> Cues to action <i>Environmental factors</i> Free screening/reduced cost for screening Appointments set by polyclinic
Mohan et al. (2021) [31]	Cross sectional study Survey	Malaysia	Females aged 40 years and older (n = 250)	Breast cancer	<i>Personal factors</i> Fear, pain/discomfort, embarrassment <i>Social factors</i>	Not reported

(Continues)



TABLE 2 | (Continued)

Author (year)	Study design/ methodology utilised	Country	Participant sample size (n)	Cancer types	Barriers addressed	Facilitators addressed
Suwankhong et al. (2023) [23]	Qualitative study Interview	Thailand	Females living in a multicultural area aged between 30 and 59 years with no previous history of breast cancer (n = 30)	Breast cancer	<i>Personal Factors</i> Breast cancer perceived as uncurable illness, breast cancer cannot be prevented, unlikelihood of occurrence, shame  <i>Social Factors</i> No prior family history of cancer  <i>Environmental factors</i> Lack of time	<i>Personal factors</i> Early diagnosis <i>Social factors</i> Family history of cancer
Tan et al. (2020) [35]	Qualitative study Interview	Singapore	Siblings of the colorectal cancer patients (n = 36)	Colorectal cancer (CRC)	<i>Personal Factors</i> Fear  <i>Environmental factors</i> Inconvenience, cost	<i>Social factors</i> Encouragement of family and friends
Teo et al. (2013) [36]	Cross-sectional study Questionnaire	Singapore	Females (aged between 40 and 70 years who had no prior history of breast cancer) (n = 208)	Breast cancer	<i>Personal factors</i> Lack of knowledge, fear  <i>Environmental factors</i> Lack of time, cost	<i>Personal factors</i> To know about own health, seek reassurance of their health, early diagnosis  <i>Social factors</i> Reminders, social support, doctor's advice
Wee et al. (2016) [37]	Cross sectional study Interview	Singapore	Singaporean residents staying in two rental flat communities in Singapore (n = 20); healthcare providers (n = 9)	Colorectal, cervical and breast cancers	<i>Personal factors</i> Knowledge of cancer screening, procedural issues/ fear of side effects, fear, attitudes  <i>Environmental factors</i> Sources of information, primary care characteristics, costs	<i>Personal factors:</i> Misperceptions around procedure, increased knowledge/ awareness, having experienced the test  <i>Social factors:</i> Friends and families' perceptions  <i>Environmental factors:</i> Free/subsidised screening

(Continues)

TABLE 2 | (Continued)

Author (year)	Study design/ methodology utilised	Country	Participant sample size (n)	Cancer types	Barriers addressed	Facilitators addressed
Wongwatcharanukul et al. (2014) [10]	Cross-sectional analytic survey	Thailand	Hmong hill tribe women aged 30–60 years (n = 547)	Cervical cancer	<i>Personal factors</i> Shy, fear, low perceived susceptibility, lack of knowledge <i>Environmental factors</i> Lack of time, inconvenience and cost	<i>Personal factors</i> Previous pregnancy, receipt of information about cervical cancer screening, perceived risk of developing cervical cancer <i>Social factors</i> Numbers of years of school attendance, animistic religious beliefs Not reported
Yong et al. (2016) [38]	Cross sectional study as part of a RCT Surveys + Interviews	Singapore	Singapore residents aged > 50 years old (n = 342)	Colorectal cancer (CRC)	<i>Personal factors</i> Low perceived susceptibility <i>Environmental factors</i> Inconvenience, lack of time	<i>Personal factors</i> General health problems, believe to have signs and symptoms, to ensure self free from colorectal cancer, routine health check-up <i>Social factors</i> Physician recommendation, peer and relative influence
Yusoff et al. (2012) [32]	Cross sectional Questionnaire	Malaysia	Average risk individuals (n = 1905)	Colorectal cancer (CRC)	<i>Personal factors</i> Embarrassment, feeling uncomfortable, not bothered, busy, fear of result, troublesome procedure, no signs and symptoms <i>Social factors</i> Never received advice to do screening <i>Environmental factors</i> Time and cost <i>Behavioural factors</i> Lack of knowledge of the procedure	<i>Personal factors</i> General health problems, believe to have signs and symptoms, to ensure self free from colorectal cancer, routine health check-up <i>Social factors</i> Physician recommendation, peer and relative influence

the difficulty in making an appointment, waiting times involved, and fore-going other health check-ups perceived to be more demanding.

### 3.2.4 | Social Influences

Friends and family have a large influence on an individual and their choices. Bad experiences communicated by these influential figures were a barrier to cancer screening participation and were addressed by Malhotra et al. [9]. Social influence can be determined as a wider cultural influence. Cultural barriers for breast cancer screening were reported in five studies [9, 22, 25, 31, 33]. Malhotra et al. [9], Mohan et al. [31], and Surendran et al. [22] explored the discomfort of having a male doctor for the intimate procedure associated with breast cancer screening whilst Al-Dubai et al. [25] presented the belief that women should not touch their own bodies for self-screening. A subsequent cultural barrier included by Goh et al. [33] and Malhotra et al. [9] was fatalism; the belief that all events are inevitable and predetermined. A lack of social support also proved to be a barrier as the lack of recommendation from doctors was addressed in a study by Bujang et al. [27] and Doraimuthu et al. [28].

### 3.2.5 | Behavioural Factors

Behavioural barriers are attentive to the lack of skills required for cancer screening and were explored in three studies [25, 27, 32]. These can be specific, such as the lack of knowledge of how to perform a breast cancer screening examination by oneself, as addressed by Al-Dubai et al. [25], or generalised into being uninformed or unaware of how cancer screening is performed [27, 32].

### 3.2.6 | Description of Facilitators Addressed

Facilitators to cancer screening were addressed in 18 studies [8–10, 20, 22–24, 26–28, 32–37, 39, 40]. Similarly to the barriers, the facilitators involved personal cognition, environment, social influences and behaviours. The type of cancers addressed in the studies were colorectal cancer, cervical cancer, and breast cancer.

### 3.2.7 | Personal Cognitive Factors

Education, self-perception of risk, reassurance and past medical history were the personal factors that facilitate cancer screening in SEA. Education was identified as a facilitator for cancer screening by four studies [10, 27, 37, 39]. Having a good knowledge of risk factors was a facilitator found by Bujang et al. [27] while a better general health education was a facilitator recognised by Solikhah et al. [39]. Increased knowledge of cancer screening served as a facilitator for those interviewed by Wee et al. [37]. Receiving information about cervical screening was specified as a facilitator by Wongwatcharanukul et al. [10].

Self-perceived risk of cancer was recognised as a facilitator for cancer screening by five studies [10, 26, 27, 32, 33]. Bujang et al. [27], Goh et al. [33], and Wongwatcharanukul et al. [10] identified that self-perceived susceptibility of cancer was a facilitator for their participants. This was similarly found in Malaysia by Yusoff et al. [32] where the belief of having colorectal cancer signs and symptoms acted as a screening facilitator. In addition, Al-Naggar and Bobryshev [26] found that viewing cancer screening as something very necessary enables colorectal cancer screening in Malaysia.

Four studies identified reassurance of being cancer-free as a facilitator for cancer screening [26, 32, 34, 36]. Al-Naggar and Bobryshev [26] discussed that participants' wanting to be aware of the presence of breast cancer acted as a facilitator for females in Malaysia and seeking reassurance of own health was a breast cancer screening facilitator for females in Singapore [34, 36]. Similarly, Yusoff et al. [32] found that the Malaysian population wanted to get screened to ensure themselves free from colorectal cancer.

Past medical history was addressed as a cancer screening facilitator by three studies [10, 32, 37]. Having experienced cancer screening in the past was a facilitator for Singaporean residents interviewed by Wee et al. [37]. Previous pregnancies facilitated cervical cancer screening among the Hmong hill tribe women in Thailand [10]. In Malaysia, Yusoff et al. [32] found that having general health problems was a motivator for their participants to get screened for colorectal cancer.

### 3.2.8 | Environmental Factors

Reduced costs, access to healthcare, and reminders are the environmental factors that facilitate cancer screening in SEA. Reduced cost as a facilitator was discussed by three studies [21, 22, 37]. All three studies found that free or reduced cost of screening, and cost subsidised by public health insurance schemes like Medishield in Singapore facilitated their participants to get screened for colorectal, cervical and breast cancers [21, 22, 37].

Two studies found that increasing healthcare access was an environmental facilitator for cancer screening [9, 39]. Malhotra et al. [9] identified appointments set by a polyclinic facilitated breast and cervical cancer screening in Singapore whereas in Indonesia, Solikhah et al. [39] shared that creating access to breast cancer screening facilitated participation. Reminders such as invitation letters for mammography as facilitators to breast cancer screening were addressed in Singapore by Goh et al. [33] and Teo et al. [36].

### 3.2.9 | Social Influences

Social influences from family and friends, health professionals, socio-economic status, schooling years, and animistic religious beliefs can be powerful influences. Social support was identified to be a cancer screening facilitator by 11 studies [8, 24, 27–29, 32, 33, 35–37, 40]. Encouragement from family and friends was

recognised to be a major social facilitator to cancer screening in Malaysia [28, 29, 32] and Singapore [33, 35, 36]. Wee et al. [37] similarly shared that participation in cancer screening is also influenced and facilitated by friends and families' perceptions for Singaporean residents. A physician's recommendation to get screened was also a screening facilitator in Malaysia [8, 24, 27, 29, 32], Singapore [36] and Vietnam [40]. A higher socioeconomic status was explored as a facilitator by one study [39]. Other facilitators identified include holding animistic religious beliefs and the number of school years attended for the Hmong hill tribe women in Thailand [10].

### 3.2.10 | Behavioural Factors

Behavioural factors that facilitate cancer screening were covered in two studies [9, 32]. Malhotra et al. [9] shared that being rewarded lower premiums for those who screen was a facilitator in Singapore and Yusoff et al. [32] identified having routine health check-ups as a facilitator in Malaysia.

## 4 | Discussion

### 4.1 | Multifactorial Barriers to Cancer Screening Participation

A feature of all barriers identified in this research was that they were multifactorial. Critical barriers found in this review were a lack of knowledge, costs, and the belief of a low personal susceptibility. This may contribute to the misconceptions that screening is uncomfortable and unpleasant [21, 25, 28]. These findings are similar to those reported in other developing countries within the African region, with lack of knowledge about cancer and treatment being a common barrier [42, 43]. Knowledge as barrier to cancer screening too were reported in developed countries with some population groups such as Hmong Americans [44]. However, Khan et al. [41] found that in Malaysia, negative perceptions, cultural beliefs, and social support were barriers to cancer screening participation.

Cost of screening tests were barriers for the participants in several studies within SEA [20, 27, 29, 31–37, 40]. However, low colorectal cancer screening uptake was found in Malaysia [27] despite free screening being offered highlighting other drivers for participation. Costs and embarrassment in colorectal screening were reported as barriers within United States and Europe as well [45]. Treatment related costs after cancer diagnosis and perception of possible financial burden following diagnosis were reported as barriers in Malaysia [31, 46]. This barrier was also featured in a Kenyan study that reported a delay and cessation of treatment due to the inability to afford prescribed medicines [47]. Cost was also a major barrier to breast cancer screening in lower-socioeconomic areas in the United States [48].

The belief that screening was unnecessary in the absence of symptoms was an important barrier [25, 27, 38]. Similar findings were reported by a Australian study that found being asymptomatic to be the most common reported reason for not

undergoing colorectal screening [49]. This is also evident in developing countries as the belief that only symptomatic women need to get cervical cancer screened was the second most reported barrier [42].

### 4.2 | Cultural Aspects Associated With Breast Cancer Screening

SEA cultural aspects, including religion and social aspects, proved to be a specific barrier to breast cancer screening, due to removal of clothing as well as direct attention to one's breasts. Many consider their body to be private and not to be revealed to strangers or felt by oneself [25]. This highlights the importance of ensuring safe and comfortable environment for the patient, for a professional approach to be maintained and to provide sufficient education regarding the screening process. Despite health care advances, perception of cancer fatalism in Singapore was reported by Goh et al. [33], Malhotra et al. [9], and Wee et al. [37]. Other cultural aspects such as traditional prioritisation of family over individual health, gender roles, spiritual and traditional beliefs, and stigma and shame may also impact cancer screening. Addressing these challenges requires a multifaceted approach which acknowledges local values and beliefs, combats stigma and misinformation, raises awareness and improves access. Strategies may include tailored educational campaigns, engaging with family and community to support participation in screening, working with local leaders and advocates to normalise screening. Ensuring easy access to screening—whether at home or within local communities—is also crucial. Additionally, using digital technologies—whether for education or appointment reminders—can help improve attendance and participation in screening programs.

### 4.3 | Enabling Factors to Cancer Screening Participation

This review found that knowledge regarding cancer, cancer screening and general health enabled participation in screening measures in SEA [10, 27, 37, 39]. Bujang et al. [27] found that only approximately half of participants had good knowledge of the signs, symptoms, and risk factors of colorectal cancer. Previous research, albeit from western countries, found that higher knowledge regarding screening was also an important facilitator in cancer screening [50]. Social support was also an important facilitator. The perception of screening by family and friends, encouragement from these valued people and recommendation from a physician were factors that were associated with engagement. [8, 24, 27–29, 32, 33, 35–37, 40]. These findings are supported by a review of cervical cancer screening in European Union member states [51]. Support and approval from valued people in an individual's life may help to provide a feeling of acceptance and positive attitude toward screening, and therefore increase participation. Information and encouragement from specialists in health, such as physicians, may again act as a motivating factor by providing expert advice from a trusted source. Similarly, the role of digital technology too can promote equity in cancer screening and promote sustainable health development. For example, Kharbanda et al. [52] highlight the

potential for digital possibilities in the prevention and early detection of oral cancer in SEA.

#### 4.4 | Strengths and Limitations

While this review was underpinned best practice standards in the conduct and reporting of a scoping review, there are some limitations. As many included studies (13/18) were cross-sectional study designs, barriers which evolve over time may have been missed. Future research could utilise longitudinal study designs to capture change over time and investigate the cause-and-effect relationships of the factors influencing cancer screening uptake found. As the search was limited to English language, language bias may be present especially as studies local to SEA may be published in native languages and hence excluded. This might be one explanation as to why there were no included studies from Brunei, Timor-Leste, Philippines, Laos, or Vietnam. Future qualitative research, with its focus on understanding the 'why' could help to explore factors contributing to cancer screening participation uniquely in the socio-cultural context of SEA. Given the increasing use of telehealth, future research could investigate if use of technology may address access barriers to screening in SEA.

#### 4.5 | Conclusion and Clinical Implications

This scoping review aimed to identify and understand the facilitators and barriers associated with cancer screening participation across the SEA populations. Using SCT as the overarching framework, this review has identified multifactorial barriers with a large focus on personal factors, whilst the facilitators had a focus on a social influence. This is not surprising given the influencing role of culture, and its associated social and belief systems, amongst SEA. Therefore, a multifactorial approach, customised to these population groups, is required to reduce the barriers, and promote facilitators to increase the participation rates of cancer screening across SEA.

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#### Author Contributions

The final manuscript has been read and approved by all authors. In addition, this manuscript has not been published, accepted for publication or under editorial review for publication elsewhere. The protocol of this scoping review was developed apriori and registered with Open Science Framework (<https://osf.io/vhzda/>).

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#### Ethics Statement

The authors have nothing to report.

#### Conflicts of Interest

The authors declare no conflicts of interest.

#### Data Availability Statement

The authors have nothing to report.

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## Supporting Information

Additional supporting information can be found online in the Supporting Information section.