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Associated Factors of Cervical Cancer Screening Participation Among Women in Asia: A Scoping Review

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Abstract

Cervical cancer remains a major public health problem worldwide, particularly in Asian countries where screening participation rates remain below the global elimination target established by the World Health Organization. Despite the availability of effective screening methods such as Pap smear, HPV testing, and visual inspection with acetic acid (VIA), many women still experience barriers related to socioeconomic status, health literacy, cultural beliefs, and healthcare accessibility. This study aimed to identify and synthesize factors associated with cervical cancer screening participation among women in Asia. This research employed a scoping review design following the methodological framework of Arksey and O'Malley and the PRISMA-ScR reporting guidelines. Data were collected from PubMed and ScienceDirect databases using relevant keywords related to cervical cancer screening participation and associated determinants in Asian populations. A total of 18 studies met the inclusion criteria and were analyzed using thematic synthesis. The findings revealed that education level, income, employment status, health insurance coverage, healthcare accessibility, and physician recommendation were the most influential determinants of screening participation. In addition, cultural stigma, fear of diagnosis, embarrassment, and fatalistic beliefs were identified as important barriers. In conclusion, cervical cancer screening participation in Asia is influenced by multidimensional factors requiring integrated interventions that address social inequalities, strengthen healthcare systems, and improve culturally sensitive health promotion programs.

INTRODUCTION

Cervical cancer remains a major public health concern worldwide, with an estimated 604,000 new cases and 342,000 deaths in 2020, disproportionately affecting women in low and middle income countries (WHO, 2025). Asia bears a substantial share of this burden, accounting for nearly 60% of global cervical cancer cases, with marked disparities in incidence and mortality across sub regions (Sung et al, 2021). Despite the well-established effectiveness of screening methods such as Pap smear, HPV testing, and visual inspection with acetic acid (VIA) in reducing incidence and mortality, screening coverage in many Asian countries remains below the 70% target set under the global strategy to eliminate cervical cancer as a public health problem (WHO, 2021). Participation in cervical cancer screening is influenced by a complex interplay of individual, sociocultural, economic, and health system related factors. Previous studies in Asian settings have reported association with age, education, knowledge, cultural beliefs, spousal support, cost, accessibility of services, and provide recommendation. However, the evidence is fragmented across countries and contexts. A comprehensive mapping of these determinants is essential to understand patterns of inequity and to inform context-specific interventions. Therefore, this scoping review aims to systematically map and synthesize existing evidence on factors associated with cervical cancer screening participation among women in Asia. Specifically, this review seeks to identify

individual, sociocultural, economic, and health system-related determinants that influence cervical cancer screening participation. The review also explores variations in screening uptake across demographic, geographic, and socioeconomic subgroups. In addition, it summarizes intervention strategies that have been implemented to improve screening participation. Finally, it identifies research gaps that can guide future studies as well as inform policy and programmatic interventions in the region.

In Asia, the burden of cervical cancer is especially significant. GLOBOCAN 2022 data show that Asia recorded 397,082 new cervical cancer cases among women, making cervix uteri one of the leading female cancer sites in the region. This figure confirms that Asia carries a substantial share of the global cervical cancer burden, particularly because the region includes countries with diverse health systems, socioeconomic conditions, cultural norms, and screening infrastructures. Although screening methods such as Pap smear, HPV testing, and visual inspection with acetic acid have proven effective, participation remains uneven across Asian countries.

The global strategy for cervical cancer elimination emphasizes the 90-70-90 targets, including 70% screening coverage among women by ages 35 and 45. However, many Asian countries still face difficulties in achieving this target because screening participation is affected by individual, socioeconomic, cultural, behavioral, and health-system determinants. The attached study also confirms that screening participation in Asia remains below the expected global target and is influenced by education, income, access to services, physician recommendation, stigma, fear, and fatalistic beliefs.

Previous research has shown that cervical cancer screening behavior is strongly associated with women's education, income, employment status, insurance coverage, and access to health facilities. A systematic review on socioeconomic factors in Asian countries found that higher education was consistently related to higher screening rates, indicating that health literacy plays a central role in preventive health behavior. This suggests that women with better educational backgrounds are more likely to understand the benefits of screening, recognize cervical cancer risk, and navigate available health services.

Recent studies across Asia further demonstrate that provider recommendation and health-system accessibility are important facilitators of screening participation. The reviewed manuscript identified 18 studies from Oman, China, India, Thailand, South Korea, Japan, Vietnam, and Malaysia, showing that physician recommendation, health insurance, proximity to health facilities, and service integration repeatedly increase the likelihood of screening uptake. Conversely, rural residence, unstable employment, low income, and limited health service access reduce participation.

Despite the growing number of studies, the evidence remains fragmented across countries, populations, and screening methods. Some studies focus on migrant women, others on rural communities, ethnic minorities, online survey populations, or nationally representative datasets. This diversity enriches the literature but also creates difficulty in identifying consistent regional patterns. Therefore, a scoping review is important because it can map broad evidence, classify determinants, and identify recurring barriers and facilitators across different Asian contexts.

The research gap lies in the limited synthesis of multilevel determinants of cervical cancer screening participation among women in Asia. Many previous studies examine individual factors such as knowledge, age, or perceived risk, but fewer studies integrate these with structural determinants such as healthcare access, socioeconomic inequality, insurance coverage, and provider recommendation. In addition, cultural issues such as embarrassment, stigma, fear of

diagnosis, and fatalism are often discussed separately, even though they interact with education, family support, and health-system trust.

This research is urgent because low screening participation directly undermines cervical cancer prevention and delays progress toward global elimination targets. Screening programs cannot succeed if women face economic barriers, lack information, live far from services, or feel culturally uncomfortable seeking gynecological examinations. The urgency is also strengthened by the fact that cervical cancer prevention requires early and regular participation, not only treatment after symptoms appear. Thus, understanding the determinants of participation is essential for designing targeted and equitable interventions.

The novelty of this research lies in its effort to synthesize evidence on cervical cancer screening participation across Asia using a scoping review approach. Rather than focusing on one country or one determinant, this study maps individual, socioeconomic, behavioral, cultural, and health-system factors together. This broader synthesis provides a more comprehensive understanding of why women participate or do not participate in screening, while also identifying which determinants appear most consistently across Asian settings.

Therefore, this study aims to map and synthesize existing evidence on factors associated with cervical cancer screening participation among women in Asia. The contribution of this research is expected to support policymakers, healthcare providers, and public health practitioners in designing culturally sensitive, accessible, and equity-oriented screening programs. The objective is to identify dominant barriers and facilitators, while the benefit is to provide an evidence base for improving screening uptake, reducing preventable cervical cancer mortality, and supporting regional progress toward cervical cancer elimination.

METHOD

This review was conducted in accordance with the methodological framework developed by (Arksey & O'Malley, 2005), further refined by (Danielle et al., 2010), and reported in line with the PRISMA-ScR guidelines (Tricco et al., 2018).

1. Eligibility Criteria

   Inclusion Criteria:

   a) Population: Women of reproductive age (15-49 years) or older living in Asian countries.
   b) Concept: factors (individual, interpersonal, structural) influencing participation in cervical cancer screening.
   c) Context: any setting within Asia
   d) Types of research: original research

   Exclusion Criteria:

   a) Studies not conducted in Asia
   b) Articles focusing solely on HPV vaccination without reference to screening
   c) Not original research: editorials, commentaries, scoping review, systematic review, case report, and conference abstracts, etc.

2. Information Sources, Search Strategy, and Data Synthesis

   A systematic search will be conducted in PubMed and ScienceDirect using a structured search strategy that combines keyword related to "cervical cancer," "screening," "participation," "factors," and "Asia," applying Boolean operators (AND/OR). The search strategy will be tailored to each database. Retrieved data will be analyzed using descriptive

numerical summaries and thematic content analysis. Findings will be presented in tabular and narrative formats, categorized by factor types (individual, sociodemographic, behavioral, health system, cultural and social factors).

The initial database search yielded 1,190 records. After removing duplicates, 854 unique articles remained. Following title and abstract screening, 195 full-text articles were assessed for eligibility. A total of 18 studies met the inclusion criteria and were included in this review. The selection process is illustrated in the PRISMA-ScR flow diagram (figure 1).

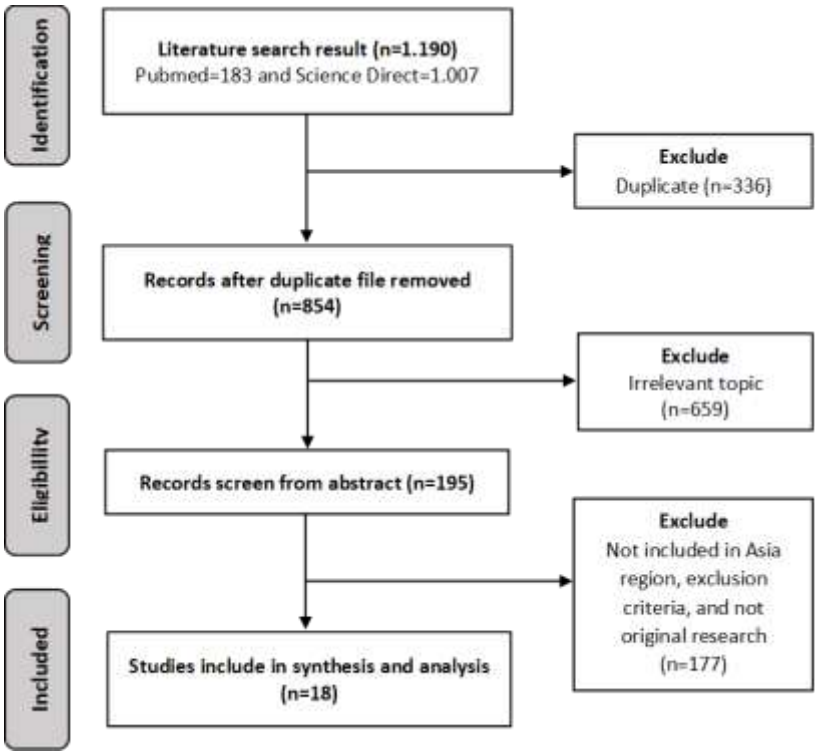

Figure 1. PRISMA ScR Flow Diagram

RESULTS AND DISCUSSION

This scoping review identified 18 studies published across multiple countries in Asia, including Oman, China, India, Thailand, South Korea, Japan, Vietnam, and Malaysia. These studies primarily employed cross sectional designs, with both quantitative and qualitative approaches, targeting adult women of screening eligible ages and in some cases, healthcare providers or specific immigrant populations. Study settings ranged from online surveys and primary healthcare centers to community-based assessments and household interviews, reflecting diverse sociocultural and healthcare contexts.

The included studies examined various types of cancer screening, predominantly cervical cancer screening using Pap smear, visual inspection with acetic acid (VIA), and HPV testing, with some studies also reporting breast and colorectal cancer screening outcomes. Outcomes assessed included screening participation or uptake, knowledge and awareness, attitudes and beliefs, and factors influencing screening behavior. Sample sizes varied widely, from small qualitative interviews (n=12) to nationally representative datasets exceeding 399,000 participants.

Table 1 summarizes the characteristics of the included studies, including the country,

study design, setting, population, sample size, type of screening, and primary outcomes measured.

Tabel 1. Characteristic of Included Studies

Author (years)	Country	Study Design	Setting	Population	Sample	Screening Type	Outcome Measured
(Al Alawi et al., 2023)	Oman	Quantitative cross-sectional study	Conducted online, recruiting participant from all 11 governorates of Oman	Adult Omani residents, male and female, aged 18 years or over, including healthcare providers and others	1403 participants including 952 parents and 369 healthcare providers. A convenience sampling technique was used	The study focused on knowledge, attitudes, and acceptance toward HPV infection and vaccination	1. Knowledge of HPV infection, risk factors, transmission and prevention 2. Attitudes and beliefs about the HPV vaccine 3. Acceptance of an Omani national HPV vaccination program
(Hu et al., 2025)	China	Cross sectional study	Mangshi Maternal and Child Health Hospital and other locations like participants homes or community centers, depending on availability	Migrant Burmese woman in Mangshi	1504 participants were included in the final analysis. Recruitment was via convenient sampling	The study assessed participation, knowledge, and attitudes regarding cervical cancer screening	Primary outcome: cervical cancer screening participation (defined as having ever attended screening) Secondary outcome: Knowledge level (dichotomized into high >2 points and low <2 point based on maximum score of 19 points) Other areas measured: Attitudes toward cervical cancer prevention/ control, including

							willingness to participate in screening and willingness to receive therapy if needed
(Min Feng Ooi et al., 2024)	India	Cross sectional analysis of data nested within the center for cardiometabolic risk reduction in South Asia (CARRS) cohort	Urban population in two large Indian cities: New Delhi and Chennai	Women aged 30-69 years	3310 women who were aged 20-69 years at baseline (2010-2011) and responded to screening history questions in 2016-2017. Women who self-reported being diagnose with any cancer at baseline were exclude (n=14)	Screening or early testing for breast cancer and cervical cancer	Cytological assessment using Pap Smear or Visual Inspection using Acetic Acid (VIA) Primary outcome: self-reported defined as having had any medical evaluation for any reason (general check-up, physician recommendation, or experiencing discomfort/ symptoms) Secondary outcome: self reported defined as evaluation among presumably asymptomatic individuals (general health check-up or doctor's suggestion based on age or family history)
(Intahphuak et al., 2021)	Thailand	Cross sectional analytic survey	A district in Chiang Rai, Thailand (a remote area, 126 km from	Lahu hill tribe women	650 Lahu hill tribe women who were convenient to provide informatio	Papanicolaou test (Pap Smear)	Factors associated with successful Pap test uptake (obtained pap test screening)

			the center of Chiang Rai specifically two randomized sub-districts within Lahu hill tribe communities)		n and met the inclusion criteria (age 30 to 60 years old with more than one year of residence)		
(Seo & Kim, 2023)	South Korea	Descriptive survey study; cross sectional survey	Online panel (data collection hired from an online research firm)	Women aged 20 to 39 years	338 participants (randomly sampled by age from an online panel of South Korean women who voluntarily consented to participate)	Papanicolaou (Pap) test screening	Pap test experience (status od Pap test screening and influencing factors)
(Afsah & Kaneko, 2025)	Japan	Qualitative study using in depth interviews	Osaka, Japan. Interviews were conducted face to face (in participant's homes or via Zoom)	Indonesian muslim migrant women in Japan	12 Indonesia muslim women.	Cervical Cancer Screening (CCS)	Awareness, beliefs, barriers, and practices related to accessing cervical cancer screening (CCS)
(Oranratanaphan et al., 2025)	Thailand	Cross sectional, community based survey	Primary care level; conducted in a high-density, low income urban community	Women aged 25-65 years who resided in the community	428 women completed the questionnare (out of 450 initially recruited)	Although multiple methods are available in Thailand (cytology, HPV testing, contesting, and VIA)	Primary: History of cervical cancer screening (ever screened or never screened)
(Yahyai et al., 2021)	Oman	Multi center cross sectional survey	18 primary healthcare centers across all 11	Omani women attending primary healthcare	805 women ≥ 18 years old	Pap smear testing	Knowledge, attitudes, and practices regarding cervical cancer

			governorates of Oman	centers across the country			and Pap smear screening
(Liao et al., 2024)	China	Cross sectional study	Rural areas of eastern China	Rural Chinese women aged 40-65 years	301 rural women aged 40-65 years	Breast cancer screening and cervical cancer screening	Status of knowledge, attitudes, and practice (KAP) related to breast and cervical cancer screening, and factors related to KAP
(B. Zhang et al., 2023)	China	Cross sectional online survey	Online, distributed via the Chinese e-commerce platform Joybuy	Women aged 18-65 years	4.518 women were included in the final analysis	Cervical cancer screening	Knowledge, willingness, uptake (participation), and barriers of cervical cancer screening services
(Gupta et al., 2025)	India	Cross sectional design using data from the NFHS-5 survey	Nationally representative statistics covering all indian states and union territories, analyzed separately for urban and rural areas	Women in India who were eligible for cancer screening according to Indian guidelines (ages 30 or older)	399.039 eligible entries were analyzed from the NFHS-5 dataset	Cervical cancer screening	Whether the individual had ever undergone a screening test for cervical cancer screening
(Nguyen et al., 2025)	Vietnam	Cross sectional design based on secondary data analysis	Based on the Vietnam sustainable development goal indicators on children and women survey 2020-2021	Vietnamese women	6668 women aged 30 to 49 years	Cervical cancer screening, which included pap smear, HPV test, and VIA test	Cervical cancer screening among women aged 30-49, measured as a binary response (Yes or No): the percentage of women aged 30-49 years who receive cervical cancer screening
(Lin et al., 2021)	China	Two citywide surveys using multistage random	Shenzhen city, one of the economically prosperous	Female migrants in Shenzhen city	12.017 female migrants were enrolled	Cervical cancer screening (cytology and HPV testing)	Cervical cancer screening participation, willingness to have cervical

		cluster sampling method in 2011 and 2014	cities in China		across both surveys		cancer screening, and willingness of self-paying screening
(Gao et al., 2025)	China	Cross sectional, community based study	Six provinces in China (Hunan, Jiangsu, Shandong, Anhui, Shaanxi, and Sichuan)	Women aged 20-49 years	9.144 women	Cervical cancer screening behavior	Association between the knowledge level of cervical cancer prevention and screening behaviors
(Sripan et al., 2025)	Thailand	Cross sectional study	Pi District, Mae Hong Son province, Northern Thailand	Ethnic women aged 30-60 years, Thai citizens, and living in Mae Hong Son district	354 women	Cervical cancer screening (Pap Smear, VIA, or HPV testing	Suboptimal screening for cervical cancer
(Cui et al., 2022)	Japan	Cross sectional study	Internet survey (online questionnaire administered by an internet research company in Hiroshima, Japan)	Women living in Japan, aged 20-69 years	816 women in their 20s and 30s	Cervical cancer screening (CCS)	Factors of psychological and personal characteristics that influence the behavior of young people regarding receiving CCS
(Al-Oseely et al., 2023)	Malaysia	Cross sectional study	Klang valley, Malaysia	Yemeni immigrant women, aged 20 years old or older	355 randomly selected respondents	Papanicolaou (Pap) smear	Cervical cancer screening practice (specifically, uptake in the last three years)
(Ishii et al., 2021)	Japan	Nationally representative cross sectional survey	Not explicitly specified beyond being a nationally representative survey in Japan, utilizing the 2016 comprehen	Women who were age-eligible for all three cancer screenings	115.254 women aged 40-69	Cervical cancer screening (CCS), Breast cancer screening (BCS), and colorectal cancer screening (CRCS)	The factors associated with each screening were investigated, using full participation as the reference category

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This section summarizes the key determinants of cancer screening participation identified across the 18 included studies. Factors were categorized into five major domains: individual level, socio-demographic, behavioral, health system, and cultural/social factors. The table 1 presents the number of studies reporting each variable, the direction of association, and a concise synthesis of findings. This structured mapping allows identification of dominant patterns, consistency of associations, and the relative strength of evidence across studies.

Table 2. Associated Factors of Cervical Cancer Screening Participation in Asia

Variable	n studies	Direction of association	Summary of Findings
Individual Level Factors			
Age	12	Negative: older age, decreased participation	Consistently shows lower participation among older age groups
Self-Rated Health	5	Positive: Poor perceived health, lower participation	Individuals with good self-rated health were more likely to undergo complete screening; poor perception increased non/partial participation
Knowledge Level	9	Positive: Low knowledge, low participation	Lack of understanding about screening benefits reduce uptake
Perceived Susceptibility	6	Positive: Low perceived risk, low participation	Women who perceived themselves as not at risk were less likely to undergo screening
Comorbidity	4	Mixed: Presence of comorbidities, mixed effects	Some studies showed comorbidities increased healthcare contact (screening opportunity), while others indicated barriers
Current Hospital Visit	2	Positive: Healthcare contact, opportunity for intervention	Many non-participants were currently accessing hospitals, indicating integration opportunities for screening
Socio-demographic Factors			
Education Level	14	Positive: Lower education, lower participation	A clear social gradient is observed, with women with only primary education showing the highest odds of non-screening
Employment Status	10	Positive: Unstable employment, lower participation	Self-employed and non-permanent workers had higher non-participation

Marital Status	8	Positive: Married, higher participation	Spousal support increases screening motivation
Income Level	11	Negative: Lower income, lower participation	Financial and access barriers
Health Insurance	9	Positive: Having insurance, higher participation	Financial coverage facilitates screening uptake
Residence (urban/rural)	7	Positive: Rural residence, lower participation	Facility access and service distribution influence uptake
Behavioral Factors			
Smoking Status	4	Positive: Current smoking, lower participation	Currents smokers were less likely to participate
Physical Activity	3	Positive: Higher activity, higher participation	Greater physical activity was associated with increased screening participation; unhealthy lifestyle were frequently correlated with lower uptake
Previous Screening History	6	Positive: Prior screening, higher participation	A history of previous screening increased the likelihood of participation; partial participants were more likely to transition to complete screening
Health System Factors			
Access to Health Facility	10	Positive: Easier access, higher participation	Distance and service convenience significantly influenced screening uptake
Physician Recommendation	7	Positive: Recommendation present, higher participation	One of the strongest predictors of screening participation across several studies
Employment Based Health Access	3	Positive: Company based facilities, higher participation	Permanent employees were better protected through employer based health systems
Opportunistic Screening Integration	2	Positive: Service integration, increased coverage	Integration opportunities, particularly among partial participants
Cultural and Social Factors			
Spousal/ Social Support	5	Positive: Social support, higher participation	Marital status was commonly used as an indicator of support, which was associated with increased screening participation
Cultural Beliefs	4	Positive: Negative beliefs, lower participation	Stigma and feelings of embarrassment acted as barriers to screening
Fatalism	3	Positive:	The perception that cancer is inevitable

	Fatalistic attitudes, lower participation	reduced motivation to participate in screening

While table 2 presents the distribution and direction of individual variables associated with screening participation, a higher-level thematic synthesis was conducted to identify broader pattern across studies. Rather than examining determinants in isolation, the findings were recognized into overarching barrier and facilitator themes. This approach allows for clearer identification of dominant structural and behavioral drivers, as well as recurring obstacles influencing screening uptake. Table 2 summarizes the key barrier and facilitator themes across the included studies, categorized by domain, and highlights their relative frequency and impact.

Table 3. Summary of Barrier and Facilitator Themes

Category	Theme	Primary Facilitators	Primary Barriers	Frequency Impact
Individual Factors	Health Literacy & Knowledge	Higher education level; adequate knowledge of screening benefits	Low education; poor knowledge; low perceived susceptibility	High
	Self-Perceived Health Status	Good self-rated health; preventive orientation	Poor self-rated health; low motivation	Moderate
	Age Related Participation	Younger eligible age groups (40-49)	Older age groups	High
Socio-demographic Factors	Socioeconomic Status	Stable employment; higher income; insurance coverage	Low income; unstable employment; self-employed without coverage	High
	Marital & Social Support	Being married; spousal encouragement	Unmarried/ divorced/ widowed; limited support	Moderate
Behavioral Factors	Health Seeking Behavior	Previous screening history; healthy lifestyle	Current smoking; low preventive behavior	Moderate
Health System Factors	Access to Health Services	Easy facility access; employment-based health services; physician recommendation	Distance to facility; lack of provider recommendation; limited service integration	High
	Opportunistic Screening Integration	Contact with health services; integrated screening program	Fragmented screening services; missed opportunities durung visits	Emerging/ Moderate
Cultural & Social Factors	Cultural Beliefs & Stigma	Community awareness; normalization of screening	Fear of diagnosis; embarrassment; fatalistic beliefs	Moderate

While table 3 synthesizes the findings into overarching barrier and facilitator themes, a further consolidation was undertaken to distill the most consistent and policy relevant conclusions across the 18 studies. This final synthesis highlights the key findings that emerged most frequently and demonstrated the strongest interpretative significance. By quantifying how many studies reported each major pattern, table 3 provides a concise overview of the dominant determinants shaping cancer screening participation and clarifies which factors carry the greatest evidentiary weight across settings.

Table 4. Summary of Key Findings Across Studies

Key Finding	Number of Studies	Interpretation
Lower education is associated with lower cancer screening participation	14	A strong and consistent social gradient exists; education functions as a fundamental upstream determinant influencing health literacy, access, and decision making capacity
Lower socioeconomic status (income/employment instability) reduces screening uptake	11	Structural and financial constraints significantly limit participation, particularly among self-employed and non-permanent workers
Physician recommendation increases screening participation	7	Provider endorsement is one of the most influential modifiable facilitators across settings
Older age groups show reduced participation	12	Participation declines in later eligible years, suggesting program disengagement or retirement related access barriers
Health insurance coverage improves screening uptake	9	Financial protection mechanisms reduce access barriers and promote preventive service utilization
Married women have higher screening participation	8	Spousal and social support enhance motivation and awareness toward preventive care
Current smokers are less likely to participate in screening	4	Risk behavior cluster; individuals with unhealthy lifestyles demonstrate lower preventive health engagement
Limited access to health facilities reduces participation	10	Geographic and logistical barriers remain significant determinants of screening inequity
Cultural beliefs, fear, and stigma hinder screening	4	Psychological and socio-cultural perception act as persistent barriers, particularly for cervical screening
Partial screening participation is more common than full adherence	6	Many women engage in one or two screenings only, indicating missed opportunities for integrated screening strategies

This scoping review synthesized evidence from 18 studies conducted across diverses Asian contexts and demonstrated that participation in cervical cancer screening is shaped by a complex interplay of individual, socioeconomic, behavioral, cultural, and health system determinants. The findings indicate that disparities in screening uptake are driven not only by knowledge gaps but also by broader structural inequalities that influence access to preventive healthcare services. Education level, socioeconomic status, healthcare accessibility, and physician recommendation emerged as the most consistently reported determinants across studies, suggesting that screening participation in Asia reflectsboth social gradients and health system capacity.

Education level was identified as one of the strongest predictors of screening participation across the included studies. Women with lower educational attainment consistently demonstrated lower screening uptake, highlighting the role of health literacy and knowledge in shaping preventive health behavior. Similar patterns have been widely reported in global studies. A systematic analysis of cervical cancer screening adherence across 153 studies found that higher educational attainment was strongly associated with increased screening participation worldwide (W. Zhang et al., 2022). Education improves individuals ability to understand health information, recognize cancer risk, and navigate healthcare systems. Evidence from population based studies futher suggests that women with higher educaton are significantly more likely to utilize cervical cancer screening service because they possess greater awareness of prevention strategies and greater confidence in interacting with health services (Ayenew et al., 2020).

Socioeconomic status also emerged as a dominant structural determinant of screening participation. Lower income, unstable employment, and lack of health insurance were consistenly associated with reduced screening uptake. Financial constraints and competing economic priorities often limit women's ability to access preventive services, particularly in low and middle income settings. Global ecidencesimilarly demonstrates that socioeconomic disadvantage significantly reduces access to cervical cancer screening and contributes to persistent inequalities in cancer prevention. Large scale analyses have shown that women in higher wealth quintiles and those with stable employment are more likely to undergo screening, while disadvantaged populations remain underrepresented in screening programs (Hailegebireal et al., 2024). These findings underscore the importance of addressing social determinants of health when designing screening interventions.

Health system factors were also prominent determinants of screening participation. Physician recommendation emerged as one of the most influential modifiable facilitators, with several studies demonstrating that women who receive direct advice from healthcare providers are significantly more likely to undergo screening. Healthcare providers play a crucial role in increasing awareness, addressing misconceptions, and encouraging preventive behaviors. Evidence from global systematic reviews has similarly identified provider recommendation as a key driver of screening participation, particularly in settings where awareness of cervical cancer prevention remains limited (Petersen et al., 2022). In addition, accessibility of healthcare facilities was repeatedly identifies as a structural factor influencing screening uptake. Women living in rural or geographically isolated areas often face significant barriers such as long travel distance and limited service availability, which reduce screening coverage.

Age related differences in screening participation were also observed across several studied included in this review. participation tended to decline among older women within eligible screening age groups. this trend may reflect lower perceived susceptibility, reeduced engagement with healthcare services after retirement, or inadequate communication regarding the continued

importance of screening in later life. While some global studies have reported higher screening uptake among women aged 35-49 due to increase contact with reproductive health services, participation may decline afterward if screening programs fail to maintain regular follow up and engagement with older populations (Mekonen et al., 2024).

Behavioral factors also contributed to disparities in screening participation. Women who engaged in unhealthy behaviors, particularly smoking, were less likely to participate in screening programs. This finding supports the concept of risk behavior clustering, whereby individuals who engage in unhealthy lifestyles are also less likely to utilize preventive health services. Global analyses have similerly identified smoking as a factor associated with lower screening adherence, reflecting broader patterns of reduced preventive health engagement among individuals with unhealthy behaviors (W. Zhang et al., 2022).

Cultural and social influences were also identified as important determinants of screening participation in several studies. Stigma, embrassment, fear of diagnosis, and fatalistic beliefs about cancer were commonly reported barriers to cervical cancer screening. In may cultural contexts across Asia, discussion of reproductive health remain sensitive topics, which may discourage women from seeking gynecological examinations. Previous global reviews have highlighted similar sociocultural barriers, including gender norms, misinformation, and fear of cancer diagnosis, particularly in low and middle income countries where community awareness of cervical cancer prevention remains limited (Petersen et al., 2022).

The findings of this review are particularly relevant in the context of the global cervical cancer elimination initiative led by the World Health Organization. The global strategy aims to achieve the 90-70-90 targets by 2030, including 90% HPV vaccination coverage among girls, 70% screening coverage among women by ages 35 and 45, and 90% treatment coverage for women with cervical disease (WHO, 2021). However, current global screening coverage remains substantially below this target. Global estimates suggest that approximately two-thirds of women aged 30 until 49 worldwide have never been screened for cervical cancer, highlighting a major gap in prevention efforts. Modelling studies further demonstrate that combining HPV vaccination with high screening coverage could avert millions of cervical cancer cases and accelerate elimination, particularly in low and middle income countries (Ramanathan et al., 2020).

The determinants identified in this review highlight several critical barriers that must be addressed in order to accelerate progress toward the elimination targets. Improving health literacy, expanding accessible screening services, strengthening healthcare provider engagement, reducing financial barriers are essential stategies for increasing screening participation. In addition, integrating cervical cancer screening with routine reproductive and primary healthcare services may provide opportunities to reach women who otherwise have limited contact with preventive health programs.

From a policy perspective, these findings emphasize the importance of adopting multilevel interventions that address social determinants, helath system accessibility, and behavioral factors simultaneously. Programs that combine community based health education, provider training, financial protection mechanisms, and integrated service delivery are more likely to achieve sustainable improvements in screening coverage. Targeted outreach to underserved populations, including rural women, migrant communities, and women with low socioeconomic status, is particularly critical for redducing inequalities in screening participation.

Several limitations should be considered when interpreting the findings of this review. Mosy of the included studies employed cross sectional designs, which limir causal inference regarding the relationsiop between determinants and screening behavior. Additionally,

heterogeneity in study settings, measurement approaches, and definitions of screening participation may reduce comparability across studies. Evidence from certain regions of Asia also remains limited, indicating the need for more geographically representative research.

CONCLUSION

This scoping review demonstrates that cervical cancer screening participation among women in Asia is influenced by a multidimensional interaction of individual, socioeconomic, behavioral, cultural, and health system factors. Education level, income stability, health insurance coverage, accessibility of healthcare facilities, and physician recommendation emerged as the most consistent determinants associated with screening uptake across the included studies. Women with lower educational attainment and limited economic resources were less likely to participate in screening due to inadequate health literacy, financial barriers, and restricted access to preventive services. In addition, cultural stigma, fear of diagnosis, embarrassment, and fatalistic beliefs about cancer further contributed to low participation rates in several Asian contexts. The findings also indicate that health system support, particularly provider recommendation and integrated screening services, plays a crucial role in encouraging women to undergo screening. Overall, the review highlights that improving cervical cancer screening participation in Asia requires comprehensive and multilevel interventions that address structural inequalities, strengthen healthcare accessibility, and promote culturally sensitive health education programs. Future research should focus on generating more longitudinal and intervention-based evidence to better understand causal relationships between determinants and screening behavior. Most studies included in this review employed cross-sectional designs, limiting the ability to assess long-term behavioral changes and screening adherence over time. Further studies are also needed in underrepresented regions and vulnerable populations, including rural communities, migrants, ethnic minorities, and low-income women, to ensure broader regional representation across Asia. In addition, future researchers should explore the effectiveness of integrated community-based interventions, digital health promotion strategies, and policy-driven screening programs in increasing participation rates. Comparative studies examining differences in health system models and cultural contexts between Asian countries would also provide valuable insights for developing more effective and equitable cervical cancer prevention strategies.

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