

Factors related to cervical cancer screening among Asian women

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Abstract. – OBJECTIVE: Cervical cancer is largely preventable. Although routine Pap smear screening has reduced cervical cancer-related mortality by 70-80% in all countries and by approximately 90% in developing countries, the gynecologist is still confronted with women in advanced stages of the disease. The eradication of cervical cancer depends on identifying the disease early and removing barriers to its timely detection. Given the significant burden of cervical cancer in Asian countries, we investigated factors related to its screening in Asia.

MATERIALS AND METHODS: A comprehensive search was carried out in databases such as Medline, Web of Science and Scopus for articles published until September 2020. The following keywords were used: vaginal smear, Pap smear, cervical cancer screening, barriers, obstacles, challenge, early detection, the name of each Asian country, and a combination of these words.

RESULTS: Seventy-five articles were included in the study. The investigation revealed various factors related to cervical cancer screening in Asian women, including sociodemographic factors, awareness, attitudes and beliefs, perceived risk, psychological factors, self-efficacy, previous experiences, time, household, culture, fatalism, social support, access, cost, safety, insurance and health system-related factors.

CONCLUSIONS: Several barriers hinder the efficacy of a screening program. Its success requires the use of educational interventions, professional and inter-professional cooperation, allocation of sufficient resources, and policymakers focusing on the elimination of barriers.

Key Words:

Cervical cancer, Screening, Barriers, Asia, Pap smear.

Introduction

Cervical cancer is a matter of public health concern and the most common cancer in 42 low-income countries¹. It is estimated that, by 2030, about half a million women will die each year from cervical cancer; 95% of the deaths will occur in low- and middle-income countries². Cervical cancer screening was introduced several years ago as a means of reducing disease-related mortality and morbidity; its main purpose is identification of the disease in an early stage^{3,4}. However, the coverage and success of screening programs have been inadequate in some areas. According to the Institute for Health Metrics and Evaluation (IHME), the ratio of deaths to newly diagnosed cases of cervical cancer in 2010 was similar to that in 1980, which indicates that little has changed over these years⁵. Although routine Pap smear screening has reduced cervical cancer-related mortality by 70-80% in all countries and by approximately 90% in developing countries⁶, the gynecologist is still confronted with women in advanced stages of the disease⁷. In recent years, policymakers in many countries have endeavored to expand the coverage of screening programs, and each has followed a different path to achieve this goal. Identifying and removing barriers to screening is vitally important. The barriers are related to several factors such as culture, religion, economy, and education^{8,9}. Since a significant number of cervical cancers and mortalities occur in Asian countries, and more than a third of the world's cervical cancer burden is seen in India and China¹, we investigated barriers to cervical cancer screening in Asia.

Materials and Methods

Search Strategy

Medline, Web of Science Core Collection (Indexes = SCI-EXPANDED, SSCI, A & HCI Timespan) and Scopus databases were searched for articles published until September 2020, using the following keywords: Pap smear, cervical cancer screening, barriers, obstacles, challenge, early detection, the name of each Asian country, and a combination of these words. Additionally, reputed journals were searched manually for full-text articles and related systematic reviews. All retrieved articles were entered into a database on Endnote X7.

Inclusion Criteria

Articles that contained the following phrases or were related to the following phrases were selected: cervical cancer screening performed in healthy women, factors related to cervical cancer screening, conducted in an Asian country, and full-text qualitative/quantitative articles in the English language. Articles featuring the keywords in their titles or abstracts were selected. No restrictions were applied regarding design, or year of publication.

Exclusion Criteria

Comments, editorials, systematic reviews, conference abstracts, opinion statements, practice guidelines, case studies or reports, studies addressing screening obstacles for cervical and breast cancer together, studies with no full text, and studies conducted on immigrants in non-Asian countries or Asian women living in non-Asian countries were excluded from the analysis.

Data Extraction

The articles were searched by one of the authors. Two authors were independently responsible for the inclusion and exclusion of articles based on titles and abstracts. Full-text articles that did not meet the inclusion criteria were checked and excluded from the analysis.

Results

Search Results

Initially, 523 articles were retrieved from selected databases and by manual search. After removing duplicate articles using the Endnote software, 356 were selected for the review. After

reviewing titles and abstracts, 265 articles were removed from the analysis as they were not related to the purpose of study and did not meet the inclusion criteria, and 18 were removed for scientific reasons. Finally, 73 articles published between 2002 and 2020 were selected for the review (Figure 1).

Characteristics of Selected Studies

In all, 52 studies had been performed by the quantitative method^{3,10-61}, 20 by the qualitative method^{8,62-80}, and one by the mixed method⁸¹. All quantitative studies were cross-sectional, with data collected through a questionnaire or interview. Of the qualitative studies, four were based on focus group discussions (FGD)^{65,67,68,80}, and 16 on in-depth interviews^{8,62-64,66,69-79}. The number of samples in the articles varied from 9⁷² to 51,989¹³. Most investigations were based on data collected from one city^{8,10-19,21-80}; only one was a multicenter study²¹. Table I provides a summary of each study included for the review.

The published articles revealed that three domains - personal, social, and cultural, and structure - were related to cervical cancer screening. Three domains related to cervical cancer screening are summarized in Table II.

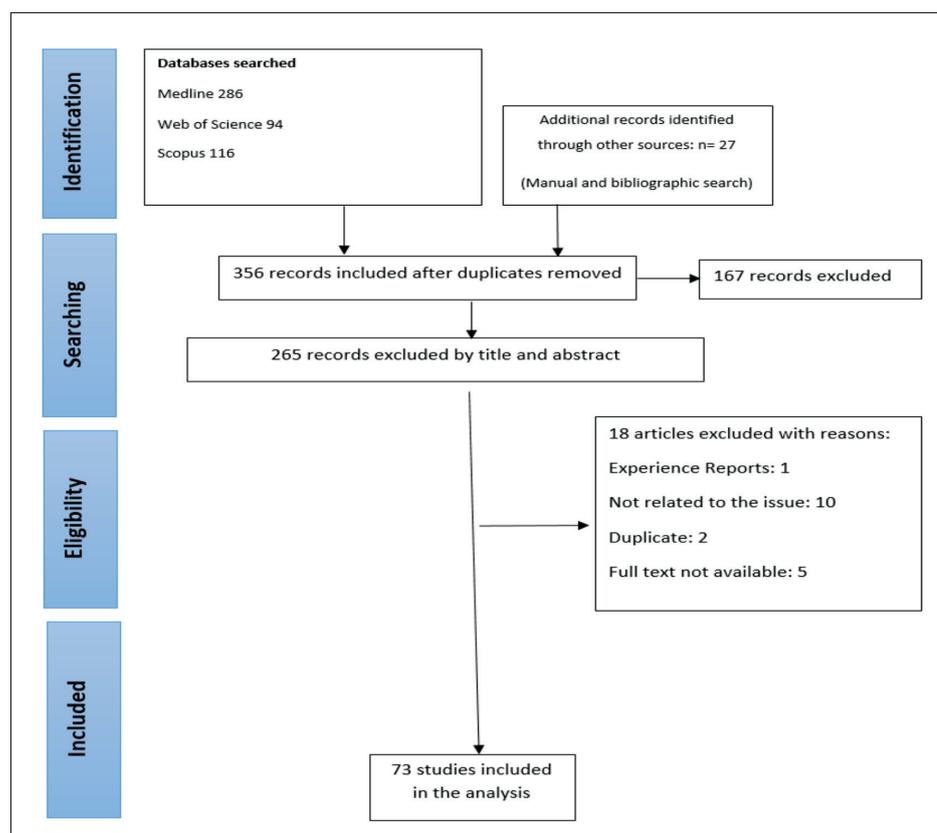
Percentages of studies reporting the variables related to cervical cancer screening are shown in Figure 2. According to Figure 2, the most variable proposed by the studies was awareness.

Personal Factors

Sociodemographic Factors

Sociodemographic factors are one of the most important predictors of cervical cancer screening. Some of the factors are related to knowledge of cervical cancer and its prevention, while others affect a person's willingness to undergo the screening test. The most important variables addressed in the studies were age^{10,11,13-19}, employment status^{11,17}, marital status^{16,18,20-22}, income^{11,16,20}, education^{10,13,14,19,21}, and place of residence¹³. In China, women below the age of 40 years were more likely to undergo a Pap smear test²⁵. In an investigation performed in Kuwait, education level was the only variable significantly associated with insufficient knowledge about the Pap smear¹⁶. However, some Iranian women believed that the willingness to undergo health-related tests does not depend on a person's level of education⁶².

Figure 1. Flowchart of studies eligible for review.



Medical History

Some investigations revealed that women of childbearing age or those with one living child¹⁰ were reluctant to visit a doctor regarding their own health problems. The number of sexual partners and human papillomavirus vaccination status were positively associated with the willingness to undergo lifetime cervical cancer screening¹¹. Age at the start of sexual intercourse, smoking¹⁴ and a positive history of cancer²⁴ were related to cervical screening.

Awareness

Knowledge of cancer, its prevention, and its early detection are the main pillars of screening tests^{63,83}. Reports from many developing countries indicate that women lack sufficient knowledge about cervical cancer^{18,25-31,33-42,63-70,81,82}. Lack of knowledge about the importance of screening^{33,43,63,67,71}, the causes^{63-65,68,69,72}, risk factors^{44,65,68}, symptoms⁶³⁻⁶⁵, and prevention of cervical cancer, screening methods^{64,65,70,73}, and the time and duration of screening^{44-46,65,74} reduce the attendance of cervical cancer screening programs. A Jordanian study⁴⁷ revealed poor knowledge of cervical cancer and the Pap

smear among women; about 95% underwent Pap smears when they had the opportunity to do so. Iranian women believed that the use of health tests is related to awareness; when women are aware of the purpose of the test, its benefits, and ultimately its importance for their health, they will undergo the test⁶². A study⁴⁸ in Pakistan showed that 70.1% of women were unaware of cervical cancer and only 5.2% of the women recognized the Pap smear as a diagnostic test. Similar figures were reported by Imam and co-workers³⁷. Attitudes towards screening are positive in the UAE, but lack of knowledge reduces the use of screening methods⁴⁹. In a study⁵⁰ performed in the UAE, 80% of the respondents had no knowledge of precancerous lesions. Ignorance may be due to several factors and has hindered the attendance of screening programs in many Asian countries.

Attitudes and Beliefs

Attitudes have a major impact on behavior. Some women believe that the Pap smear separates a large part of their uterine tissue and may therefore be very painful⁸. Doubts about the effectiveness of the test are also an obstacle to the

Table I. Characteristics of studies included in the review.

First author/ Year (Reference)	Country	Sample size	Study design	Instrument	Screening type	Proportion of women ever screened (%)	Analysis	Region
Abdullah/2011 ⁶¹	Malaysia	403	Cross-sectional	SAQ	Pap smear	38	Multivariate	East Asia
Abulizi/2018 ²⁵	China	7100	Cross-sectional	SAQ	Pap smear	7.4	Univariate	East Asia
Afsah/2017 ⁵²	Indonesia	384	Cross-sectional	SAQ	Pap smear, VIA, HPV test	19.3	Univariate bivariate	East Asia
Akbari/2010 ⁶⁴	Iran	86	Qualitative	Interview	Pap smear	NM	Framework method	West Asia
Al-Amro/2020 ²³	Jordan	500	Cross-sectional	SAQ	Pap smear	31.2	Multivariate	West Asia
Al-Hammadi/2017 ⁵⁰	Emirates	599	Cross-sectional	SAQ	Pap smear	54	Univariate	West Asia
Al-Naggar/2012 ¹⁸	Malaysia	117	Cross-sectional	SAQ	Pap smear	22.2	Univariate	East Asia
Al-Naggar/2010 ⁶⁷	Malaysia	17	Qualitative	FGD	Pap smear	NM	Content	East Asia
Al-Naggar/2010 ³²	Malaysia	287	Cross-sectional	SAQ	Pap smear	6	Univariate	East Asia
Al Khudairi/2017 ⁴⁶	Saudi	507	Cross-sectional	SAQ	Pap smear	24.9	Univariate	West Asia
Al Sairafi/2009 ⁶	Kuwait	281	Cross-sectional	SAQ	Pap smear	35.2	Multivariate	West Asia
Allahverdipour/2008 ²⁸	Iran	333	Cross-sectional	SAQ	Pap smear	68.5	Bivariate multivariate	West Asia
Alnafisah/2019 ³⁹	Saudi	2220	Cross-sectional	SAQ	Pap smear	15.3	Univariate	West Asia
Alwahaibi/2018 ²⁴	Oman	494	Cross-sectional	SAQ	Pap smear	60.1	Bivariate	West Asia
Amarin/2008 ⁴⁷	Jordan	760	Cross-sectional	SAQ	Pap smear	14.34	Univariate	West Asia
Amin/2020 ²⁹	Iran	15975	Cross-sectional	Interview	Pap smear	41.6	Multivariate	West Asia
Ansink/2008 ⁸⁰	Bangladesh	220	Qualitative	FGD	NM	NM	Content analysis	South Asia
Bahri/2015 ³¹	Iran	1000	Cross-sectional	SAQ	Pap smear	37.6	Univariate	West Asia
Bakheit/2004 ⁵³	Emirates	350	Cross-sectional	SAQ	Pap smear	NM	Univariate	West Asia
Baskaran/2013 ¹⁷	Malaysia	369	Cross-sectional	SAQ	Pap smear	75.6	Univariate	East Asia
Bayrami/2015 ⁸	Iran	18	Qualitative	Interview	Pap smear	NN	Content analysis	West Asia
Bou-Orm/2018 ²¹	Lebanon	2255	Cross-sectional	SAQ	Pap smear	35	Univariate multivariate	West Asia
Chang/2017 ¹⁴	Korea	3734	Cross-sectional	SAQ	Pap smear	46	Multivariate	East Asia
Choucair/2018 ³⁶	Lebanon	444	Cross-sectional	SAQ	Pap smear	37.6	Univariate	West Asia
Dhaher/2019 ⁴⁴	Saudi	255	Cross-sectional	SAQ	Pap smear	NM	Univariate	West Asia
Duran/2011 ⁷⁰	Turkey	11	Qualitative	Interview	Pap smear	NM	Content	West Asia
Erbil/2010 ²⁶	Turkey	397	Cross-sectional	SAQ	Pap smear	11.8	Univariate	West Asia
Ersin/2013 ⁶⁸	Turkey	35	Qualitative	FGD	Pap smear	NM	Content	West Asia
Feriyawati/2018 ⁵⁸	Indonesia	50	Cross-sectional	SAQ	Pap smear	NM	Univariate	East Asia
Gan/2013 ²²	Malaysia	1000	Cross-sectional	SAQ	Pap smear	48.9	Univariate multivariate	East Asia
Gu/2017 ⁷¹	China	27	Qualitative	Interview	Pap smear	NM	Content analysis	East Asia
Haji Rasul/2016 ⁷⁵	Iraq	22	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Hassani/2017 ⁷⁸	Iran	15	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Hwaid/2013 ³⁴	Iraq	198	Cross-sectional	SAQ	Pap smear	NM	Univariate	West Asia
Imam/2008 ³⁷	Pakistan	192	Cross-sectional	SAQ	Pap smear	2.6	Univariate	South Asia
Islam/2015 ⁵¹	Bangladesh	1590	Cross-sectional	Interview	Pap smear	8.3	Univariate multivariate	South Asia
Jassim/2018 ⁴²	Bahrain	300	Cross-sectional	Interview	Pap smear	40.7	Univariate	West Asia

Continued

Table 1 (Continued). Characteristics of studies included in the review.

First author/ Year (Reference)	Country	Sample size	Study design	Instrument	Screening type	Proportion of women ever screened (%)	Analysis	Region
Jia/2013 ⁴³	China	5929	Cross-sectional	SAQ	Pap smear, VIA, Colposcopy, HPV test	16.6	Multivariate	East Asia
Kaneko/2018 ¹¹	Japan	700	Cross-sectional	SAQ	Pap smear	54.7	Univariate multivariate	East Asia
Karabulutlu/2013 ⁴¹	Turkey	301	Cross-sectional	SAQ	Pap smear	16.6	Univariate	West Asia
Kaso/2019 ¹⁰	Japan	49217	Cross-sectional	SAQ	Pap smear	39.7	Multivariate	East Asia
Khan/2014 ⁴⁸	Pakistan	873	Cross-sectional	SAQ	Pap smear	17.32	Univariate	South Asia
Kim/2015 ⁷²	Korea	9	Qualitative	Interview	Pap smear	NM	Content analysis	East Asia
Ma/2009 ²⁰	Multi- national	1049	Cross-sectional	SAQ	Pap smear	62.06	Multivariate	East Asia
Maaaita/2002 ³³	Jordan	600	Cross-sectional	SAQ	Pap smear	25.5	Univariate	West Asia
Majdfar/2016 ⁵⁶	Iran	580	Cross-sectional	SAQ	Pap smear	72.6	Univariate multivariate	West Asia
Metwali/2015 ⁴⁹	Emirates	212	Cross-sectional	SAQ	Pap smear	37.3	Univariate	West Asia
Miri/2018 ³⁰	Iran	1253	Cross-sectional	SAQ	Pap smear	28.5	Path analysis	West Asia
Mustari/2019 ⁵⁴	Bangladesh	400	Cross-sectional	SAQ	Pap smear	41.8	Univariate	South Asia
Naghbi/2016 ⁶⁰	Iran	416	Cross-sectional	SAQ	Pap smear	40	Multivariate	West Asia
Norkhafizah/2019 ⁴⁵	Malaysia	210	Cross-sectional	SAQ	Pap smear	55.2	Univariate multivariate	West Asia
Obeidat/2012 ³⁵	Jordan	187	Cross-sectional	Interview	Pap smear	19.1	Univariate	West Asia
Onsuz/2014 ¹⁹	Turkey	246	Cross-sectional	SAQ	Pap smear	46.1	Univariate multivariate	West Asia
Oon/2011 ⁷⁷	Malaysia	44	Qualitative	Interview	Pap smear	79.5	Content analysis	East Asia
Oshima/2013 ⁶⁵	Japan	15	Qualitative	FGD	Pap smear	NM	Content analysis	East Asia
Park/2010 ¹⁵	Korea	2590	Cross-sectional	SAQ	Pap smear	53.9	Multivariate	East Asia
Rasul/2019 ⁷⁴	Iraq	23	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Rasul/2016 ⁶⁶	Iraq	19	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Refaei/2018 ⁷⁹	Iran	31	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Refaei/ 2017 ⁶²	Iran	14	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Refaei/ 2020 ⁷⁶	Iran	23	Qualitative	Interview	Pap smear	NM	Content analysis	West Asia
Saadoon/ 2014 ⁵⁹	Iraq	220	Cross-sectional	SAQ	Pap smear	12.6	Multivariate	West Asia
Saberi/ 2012 ⁸²	Iran	1000	Cross-sectional	Interview	Pap smear	80	Univariate	West Asia
Salem/2017 ³⁸	Saudi	506	Cross-sectional	SAQ	Pap smear	17.2	Univariate PCA	West Asia
Shakibazadeh/2008 ⁶⁹	Iran	86	Qualitative	Interview	Pap smear	NM	Content	West Asia
Singh/2012 ⁸¹	India	812	Mixed method	SAQ	Pap smear	11.62	Univariate Thematic analysis	South Asia
Suantika/2020 ⁵⁵	Indonesia	286	Cross-sectional	SAQ	Pap smear	11.5	Univariate	East Asia
Tiraki/ 2018 ⁵⁷	Turkey	400	Cross-sectional	Interview	Pap smear	67	Univariate	West Asia
Wang/ 2015 ¹³	China	51989	Cross-sectional	SAQ	Pap smear	21	Multivariate	East Asia
Wong/ 2008 ⁷³	Malaysia	20	Qualitative	Interview	Pap smear	NM	Content analysis	East Asia
Wong/2013 ³	Malaysia	213	Cross-sectional	SAQ	Pap smear	56	Multivariate	East Asia
Yanikkerem/2013 ⁴⁰	Turkey	1036	Cross-sectional	SAQ	Pap smear	24.7	Univariate	West Asia
Yang/2019 ⁶³	China	26	Qualitative	Interview	NM	NM	Thematic Analysis	East Asia

SAQ: self-administered questionnaire/ VIA: visual inspection with acetic acid/ HPV: human papillomavirus/ FGD: focus group discussion.

Table II. Domains related to cervical cancer screening reporting in the studies.

Domain	Barrier	References
Personal factors	Sociodemographic factors	(10,11,13-22,25,62)
	Past medical history	(10,11,14,24)
	Awareness	(18,25-31,33-50,62-74,71,82)
	Attitudes and beliefs	(8,30,44,63,65,68,73)
	Perceived risk	(8,43,51,62,64,65,57,71,73)
	Psychological factors	(8,30,38,42,43,47,52-55,62-71,73,75-77)
	Self-efficacy	(56,57)
	Previous experiences	(76,78)
Social and cultural factors	Time	(8,11,30,52,60,62-68,73,76,78,80)
	Household	(22,32,58,59,68,78)
	Culture	(8,22,65,67,73)
	Fatalism	(3,42,55,64,66,68,73,76)
	Social support	(63,65,79)
Structural factors	Cost	(11,50,52,63,64,67,68,71,73,76,80)
	Safety	(62,66,75)
	Insurance	(13,29,52,61,62,68)
	Health system-related factors	(11,16,23,32,47,50,60,62,58,73,74,80)

success of screening³⁰. Some Asian women visit a gynecologist only when they have symptoms of cancer or disease, such as pelvic pain or abnormal bleeding. In the absence of such symptoms, these women would not see a gynecologist^{44,63,65,68,73}.

Perceived Risk

Some women are unaware of the risk of cervical cancer. The absence of symptoms in the precancerous stage reduces the urgency of a Pap smear. These women believe that the absence of

symptoms indicates the absence of disease and therefore does not call for action^{8,51}. Others, with an optimistic view based on ignorance, believe that a healthy lifestyle, observance of health, the absence of a family history of disease, exercise, young age, and finally the absence of risk factors will shield them from cancer^{8,43,62,64,65,67,71,73}. Cancer is attributed to air pollution, smoking, and the consumption of fast foods or chemicals⁶⁴. Protection from these risk factors will prevent cancer. Some Malaysian women believed that frequent

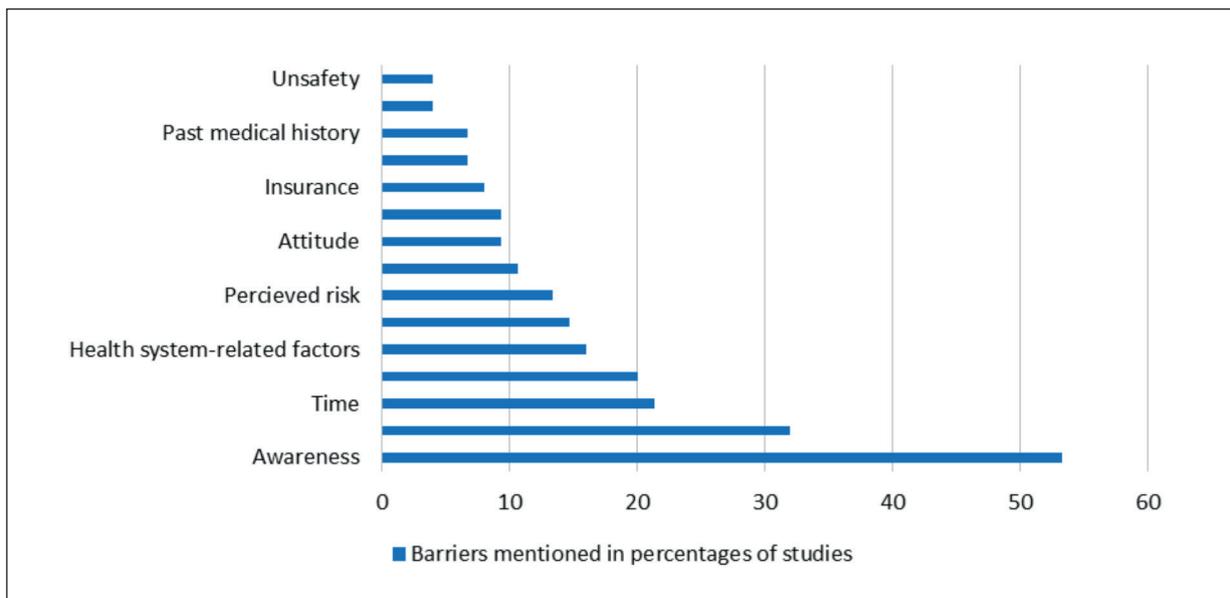


Figure 2. Percentages of studies reporting the variables related to cervical cancer screening.

cleaning of the vaginal area, hygiene (especially during menstruation), and removing semen from the genital area after sex would protect them from cervical cancer⁷³.

Psychological Factors

Shame is one of the most important obstacles to screening^{8,30,38,42,52-54,62-68,71,75,76}. Testing and sampling are perceived as an embarrassing experience. It is the greatest hindrance for some Japanese women⁶⁵. Malaysian women also described the examination as a shameful experience⁷³. Some Asian women believe that undergoing a pelvic examination and a Pap smear may cause anxiety, stress, and loss of privacy⁷³. The psychological distress is greater especially when the examiner is a man^{42,52,55,63,68,73}. Reluctance to allow vaginal and genital examination by a person other than family members is more pronounced among elderly women⁶³.

Fear is another psychological barrier to screening. Fear of self-examination and examination^{30,62,66,75,76}, of pain^{8,30,54,64,67,69,73}, fear of the result of cancer screening and diagnosis^{8,30,43,47,63,64,68-70,73,75} and, finally, fear of subsequent treatment⁷¹ are sources of psychological distress. These women try to avoid the anxiety and worry that follow a cancer diagnosis and are therefore unwilling to undergo screening tests^{63,71}. Since they associate the treatment of cervical cancer with anxiety and fear, they prefer to die with dignity than undergo the test⁷¹.

Another barrier to screening is the change in sexual life that may occur after the diagnosis of cervical cancer. Some Chinese women believe that the treatment of cervical cancer requires removal of the uterus and ovaries, which may impair their sexual activity and fertility, as well as their marital relationship⁷¹.

Self-Efficacy

Self-efficacy is an important factor in protective and preventive behavior. One study⁵⁶ showed that only 30.8% of women with low self-efficacy underwent Pap smear screening. Increasing women's self-efficacy and health literacy will enhance their knowledge of cervical cancer and will probably improve their attendance of screening tests⁵⁷.

Previous Experiences

Previous positive and negative experiences play an important role in the willingness to undergo a repeat screening test⁷⁶. These include

negative experiences from a previous test, a previous suspicious test, and fear of repeating the test⁷⁸.

Time

Time constraints are among the most important barriers to cervical cancer screening^{8,11,30,52,60,67,73,76}. Some women believe that, although they do wish to undergo a Pap smear test, they lack the time for regular tests^{8,63,64,78}. Time constraints due to working hours⁶⁵, outdoor employment⁶³, low priority of screening, child care, and involvement in household chores^{63,65,66,73,80} reduce the motivation to undergo screening. A Pap smear requires time to visit the doctor, undergo the test, have a sample taken, ensure its transfer to the laboratory, collect the result from the laboratory, and consult the doctor with the test result^{62,68,72}.

Social and Cultural Factors

Household

Research has shown that spouses and male family members are also involved in cervical cancer screening. The need for a spouse's permission to undergo the test affect the success of screening programs in some Asian countries⁶⁸. The spouse's unwillingness to permit the investigation⁷⁸, lack of attention to the screening test, lack of support for the woman^{32,58,78}, a perceived need for sexual intercourse before the test⁷⁸ and the unwillingness to permit a woman to be seen and touched by another man^{68,73} reduce the women's willingness to undergo screening. A study⁵⁹ performed in Iraq showed that the spouse's encouragement of a Pap smear was the sole factor significantly related to screening. Spouse encouragement is a predictor of Pap smear screening in Malaysia as well²².

Culture

Culture plays an important role in screening. Beliefs about illness and health, spirituality and religion, and family structure may influence an individual's decisions about screening²². One of the barriers to cervical cancer screening is sexual taboo. Women in many countries are reluctant to talk about their genitals or STDs even with a doctor^{8,65,67}, and are hence unresponsive to training programs in the field⁸. Many married women do not even speak to their husbands about the need for screening⁷³.

Fatalism

Fatalism, which jeopardizes the success of many screening programs, is a major barrier to Pap smear screening⁴². Fatalistic beliefs have led many Asian women to refuse cervical cancer screening^{3,68}. Cancer is considered a deadly disease which renders them ineffectual. Therefore, the test is useless^{64,73,76}. Some women in Iraq believed that trusting in God will save them from cancer⁶⁶. As the disease is a punishment or a divine test, a Pap smear is unnecessary⁵⁵. A study⁷³ in Malaysia revealed that fatalistic beliefs are more pronounced in elderly persons.

Social Support

Many women need support to attend preventive and screening tests. Their motivation is undermined by lack of encouragement from friends, family members and peers^{63,65,79}.

Structural Factors

Cost

A further obstacle is the cost of screening^{11,52,67,68,73,76,80}. Some women are reluctant to undergo the Pap smear test because they think it is expensive⁶⁴. The test is more common among employed women and those in higher income groups⁵⁰. Fear of positive test results is related to economic constraints. Some women believe that, in the event of a positive test, they will be unable to pay for the treatment of cancer. Ignorance, they decide, is bliss. Screening may be gratuitous, but treatment is very costly^{63,71}. Economic barriers cause women to prioritize social affairs and delay screening. The cost of living, they argue, is so high that preventive measures are not a priority⁶⁴.

Safety

Ensuring the safety of a test is one way of encouraging its attendance. Uncertainty about hospital equipment^{66,75}, the person performing the test^{62,66}, and the laboratory^{66,75} have been mentioned as barriers in various studies.

Insurance

Insurance coverage plays a role in a person's decision to undergo a screening test. The absence of insurance coverage is a major obstacle to screening^{13,29,52,61,68}. However, in the UAE, many women refrained from the screening test despite insurance coverage⁶².

Health System-Related Factors

The establishment of screening programs is a necessity. Allocation of funds⁸⁴ and insurance coverage⁸⁵, focus of the health system on screening programs⁶², the use of private health centers²³, receiving free screening quotas from the government¹¹, and the establishment of programs contribute to the success of screening programs.

Limited access to health services⁸⁰, difficulty in visiting a gynecologist⁶⁸, long distance from health centers⁶², crowded health centers^{62,68}, limited working hours at the health centers⁶², and long waiting lists^{73,68} were cited as some of the obstacles to Pap smear screening.

One study⁵⁰ showed that 77% of women are willing to undergo a Pap smear test if it is provided at a center near their homes. Although many women take responsibility for their health by undergoing screening and diagnostic tests on time, others leave it to health care providers. The latter category of women undergoes the test only if encouraged by health care providers. In many under-developed and developing countries, challenges such as shortage of medical staff⁶⁰, overcrowded medical facilities, lack of follow-up for screening services⁶², insufficient commitment of service providers to encourage screening^{16,32,47,62,68}, inappropriate attitudes of the system regarding women's health⁶², financial constraints, and poor acceptance of guidelines have hindered the implementation of screening programs. The absence of a registration system to remind people of screening programs, lack of programs to raise awareness by the ministry of health⁷⁴, inadequate monitoring of individual performance⁶², poor infrastructure in terms of screening centers and sufficient resources including human resources⁷⁴, hinder the attendance of screening tests in many Asian countries. Thus, the improvement of cervical cancer screening requires appropriate policies, educating individuals on the need for screening, and structured screening programs in collaboration with national partners and institutions.

Discussion

Adherence to cervical cancer screening programs is essential for improving patient outcomes. In the present study, we investigated the main factors impeding the implementation of cervical cancer screening programs in Asia.

Factors related to cervical cancer screening were divided into three categories: personal, social and cultural, and structural.

Our data showed that, in addition to demographic factors including nationality, socioeconomic status and study design, poor awareness of cervical cancer and its screening are the main barriers hindering the utilization of screening programs. Further barriers include psychological, socioeconomic, cultural, and cognitive factors, as well as attitudes and beliefs among Asian women. Attitudes among Muslim women are also worthy of note.

Age is considered as the most significant factor along with all sociodemographic variables. Increased age is inversely related to the number of women who periodically do screening tests. Younger women more frequently attempt screening tests because of more frequent visits for family planning, and pre- and post-pregnancy medical cares^{10,11,13-19}.

More than a half of the studies reviewed for the present report mention poor knowledge as one of the main barriers to cervical cancer screening, whereas other investigations do not mention this factor. The difference is probably related to the type of study, sampling procedure, and the sampled population. However, 32.5% of quantitative studies and 65% of qualitative studies mention insufficient knowledge as a factor responsible for the poor coverage of screening programs.

Some women are aware of cervical cancer, yet reluctant to undergo screening tests due to their negative attitudes^{44,63,65,68,73}. Knowledge alone cannot change attitudes to screening programs. Comprehension and appreciation of risks are essential to achieving the desired change in attitudes⁸⁶.

In many countries, the utilization of screening programs is hindered by psychological barriers such as fear and pain. Considering the cultural and religious context of Asian countries, shame is considered as the main barrier in performing screening tests which deprives many Asian women from regularly performing them^{8,30,38,42,52-54,62-68,71,75,76}.

Family-based values are considered as the foundation of many Asian cultures. Preferring family over one's own health, as well as gender preferences and the significant role of the male figure in decision making for hygiene-related behaviors in some Asian countries contributed to prevalence of high grade cervical cancer in the region^{32,58,78}. This cancer has endangered the life

of many women in Asian countries. There are numerous cultural obstacles in levels of individual, family, and social life. These cultural obstacles are considered as the most significant challenges encountered by those living in Asian countries which pinpoints the apparent gap in eliminating cultural obstacles. Lack of permission from husband for leaving the house or husband's negative attitude toward screening tests are positively correlated with women's inclination for undertaking screening tests. On the other hand, different affairs such as doing house chores, taking care of children, and family responsibilities would directly impact women's health^{68,73}.

The issues concerning the cost of screening tests have been long debated by many authors worldwide^{16,52,68,76}. Poverty and economic problems make it harder for people to be willing to undergo them. Maybe it's because many Asian countries' population are categorized as low-income. Although financial affordability can't guarantee the possibility of doing screening tests, but this needs due consideration as well. Moreover, people must be instructed and receive further knowledge regarding this particular type of cancer⁸⁷.

Although the correlation between the history of previous disease and preventive actions for cancer have been studied extensively, but family history of cancer is more predictive of pap test compared with other medical history²⁴; however, some studies have enumerated test accessibility as the most influential factor⁸⁸.

The establishment of a successful screening program is founded on many prerequisites. However, a search of the published literature revealed that the subject of screening programs is still poorly researched. Based on the data collected in the present study, we recommend a number of initiatives to enhance the utilization of cervical cancer screening programs in Asia; some of the primary initiatives on the part of governments include appropriate screening policies, the allocation of human and financial resources, and capacity development.

Secondary initiatives include public training programs for heightened knowledge of cervical cancer and the significance of early diagnosis and treatment. Greater awareness of risk factors for cervical cancer is associated with greater participation in screening programs⁸⁹. We registered a lack of awareness among persons in different countries, regardless of the situation in the respective country. Thus, educating Asian

women by effective mass education campaigns and community education programs is likely to enhance the popularity of screening programs. Although some authors have reported a weak association between knowledge of risk factors for cervical cancer and screening attendance⁹⁰, many investigations have shown that educating women is a crucial factor in enhancing the utilization of screening programs^{91,92}. Special public training courses about the importance of screening, its methods and its effectiveness are likely to increase screening rates by enhancing the self-efficacy of individuals.

The success of these programs would depend on taking cultural constraints into account. The utilization of financial and educational resources and infrastructure for the improvement of health literacy regarding cancer may enhance the coverage of screening programs. Knowledge encourages individuals to undergo screening, and empowers the individual in removing obstacles, including personal attitudes.

Given the fact that many women are more embarrassed if a male doctor performs the test, the provision of female doctors would probably help in persuading women to undergo a Pap smear test⁵⁰. On the other hand, improving the patient-doctor relationship by eliminating misconceptions about the testing procedure will ultimately reduce the fear of screening. This could be achieved by focusing on women's health care providers, sensitizing them to screening programs, and reducing taboos through appropriate education⁶². Improving the quality of testing would enhance public confidence and will also help to achieve screening goals. Finally, the actions of policymakers in removing screening barriers will help to identify cervical cancer in asymptomatic stages as well as reduce disease-related morbidity and mortality rates.

The preparation of screening program manuals and supervision of their administration, updating service providers about their target audience, early and appropriate execution of screening programs especially in rural areas, will contribute significantly to the success of screening programs. However, the persistence of structural barriers will hinder the efficacy of the interventions. Thus, governments would be well advised to monitor and evaluate the efficiency of screening programs, identify obstacles promptly, eliminate these, allocate resources prudently, and devise suitable remedies for emerging problems.

Conclusions

This study addressed barriers to cervical cancer screening in Asian countries. Personal, social, cultural, and structural factors were the most important obstacles to cervical cancer screening. Measures to enhance screening should address greater utilization of screening services, ensure access, reduce its cost, or provide gratuitous screening, ensure a positive attitude among screening service providers, and encourage women to undergo screening. As lack of knowledge and awareness of screening methods is one of the prime obstacles in Asian countries, the success of screening programs requires suitable educational interventions, professional and inter-professional cooperation, and the allocation of sufficient resources.

Limitations

The use of English-language articles might have limited the results of the study. Potentially valuable information in other languages was not taken into account. Another limitation was the use of different tools to measure barriers to cancer screening in different countries, which reduced the validity of comparisons and may have failed to demonstrate all barriers in a specific community.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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