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Literature Review

Factors Affecting the Utilization of Cervical Cancer Screening among Women: A Literature Review Using Ishikawa Diagram

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Abstract

Background: Cervical cancer is ranked as the third most prevalent cancer among women across the globe. Mortality due to cervical cancer can be avoided by availing timely screening services. Despite the availability of screening tools, not all women seek cervical cancer screening. Various factors have been identified by different studies affecting the utilization of cancer screening but these are not synthesized collectively. Thus, the objective of this review was to appraise the factors affecting the utilization of cervical cancer screening among women.

Methods: Different articles were searched from databases such as Google Scholar, PubMed and Science Direct. All English articles published in developed and developing countries from 1990 to 2018 were included in this review. We examined primary research and review articles pertinent to the objective of the current literature review. Findings from both quantitative and qualitative studies were reviewed and included. An Ishikawa diagram was developed to summarize various factors of cervical screening.

Findings: Factors for cervical screening, reported in different studies were clustered into sociodemographic, knowledge, resource and psychosocial factors. Among socio-demographic factors, younger age, being married, having higher level of education, and high socioeconomic status were found to be positive significant factors. Similarly, knowledge about cervical cancer and available screening tests was found to be important positive significant factors. With respect to resource factors, availability of facility or source in the area and health insurance coverage were found to affect the utilization of cancer screening positively. Psychosocial factors affecting the utilization of cancer screening included fear of screening method, lack of interest, and discomfiture to undergo the screening.

Conclusion: Younger married and educated women belonging to higher socioeconomic status, having awareness about cervical cancer and respective screening tests with adequate access to source of care with insurance coverage were found to be utilizers of the cervical cancer screening tests and programs. Findings of this review recommend to increase awareness regarding cervical cancer among women and to provide access to community-based screening programs. In addition, some type of insurance coverage can provide an extra benefit to utilize the screening services in a given community.

Keywords: *Cervical Cancer; Factors; Screening; Utilization*

Abbreviations

CIN: Cervical Intraepithelial Neoplasia; GDP: Gross Domestic Product; HPV: Human Papilloma Virus; NGO: Non-Government Organization; Pap: Papanicolaou; SES: Socio-economic Status; VIA: Visual Inspection with Acetic Acid

Introduction

Cervical cancer is considered as the third most common malignant cancers affecting women. Around half a million new cases are reported annually, second to breast cancer with 80% of burden in the low-middle income countries [1,2]. Approximately 275,000 deaths were attributed to cervical cancer in 2008, 88% of these deaths occurred in developing countries with more than half being reported from Asian countries [3]. This cancer usually affects 30 - 59 years older women and persistent infection with human papillomavirus (HPV) has been found a necessary factor to initiate the cancerous process [4]. In addition to HPV, other risk factors have been found to be associated with cervical cancer, such as sexually transmitted diseases, age at inception of sexual activity, oral contraceptive usage and tobacco intake [4]. This malignant disease consumes medical, non-medical resources and also causes productivity loss at a staggering rate [5]. These losses can be prevented by adapting various approaches mainly focusing on more than 30 years old women for screening and treatment [6]. Fortunately, proper and timely screening can identify this cancer at initial stages where treatment regimens are simple, effective and less expensive [7]. Moreover, planned screening has contributed to a decline in cervical cancer morbidity and mortality over last five decades, mainly in the developed countries [8]. However, women from low-middle income countries are yet to profit comprehensively from existing screening programs [8].

The literature suggests that invasive cervical cancer can be prevented by detecting cervical intraepithelial neoplasia (CIN) timey in the initial stages [9]. The screening tests such as the Papanicolaou (Pap) test and the visual inspection with acetic acid (VIA) tests have been proven to detect CIN effectively [10-12]. Pap test has been considered as an essential component of early detection and treatment in hospitals and clinics of different countries [13]. Moreover, the introduction of Pap test led to substantial decline in mortality and morbidity mainly in developed countries, where percentage of women screened through Pap test ranges between 68 to 84% [14,15]. However, the rates of cancer screening are quite low in developing countries where only 19% of women have been reported to screen for cervical cancer relative to more than 60% in developed countries [16]. For example, coverage of Pap test screening remains low in Asian countries, ranging from 50% in Singapore to 2.6 - 5% in India [16]. Likewise, in Bangladesh, less than 1% of 25 to 64 years older women had sought Pap test in the last 3 years [16]. In addition to this, there are limited organized screening programs with poor quality testing and inefficient performance in developing country settings. Moreover, lack of infrastructure, human resource and competing healthcare crises in underprivileged countries may further complicate the acceptance of suitable cancer screening programs [17].

Despite the accessibility to the cervical cancer screening tools, not all women commonly avail these cervical cancer screening services. It is therefore highly important to recognize the factors affecting the utilization of cervical cancer screening among women. This assessment will be useful to develop programs for women to get timely screened both in rural and urban areas. However, multiple studies have studied different factors both in developed and developing countries but these findings are not synthesized collectively. Thus, there is need to review these factors from the available literature and synthesize the same collectively in a single place. Hence we conducted a literature review to appraise the factors affecting the utilization of cervical cancer screening among women.

Methods

We searched the articles from databases such as Google Scholar, PubMed and Science Direct. All articles published from 1990 to 2018 were included in this study. All the articles were searched by using search terms such as 'cervical cancer', 'utilization,' 'screening', 'predictors', 'factors', 'determinants'. Studies being conducted on human beings in developing and developed countries and reported in English language were included. Both full-text articles and few abstracts were reviewed and included in this review. We examined primary research and review articles relevant to the objective. Findings from both quantitative and qualitative studies were reviewed and included. Fishbone or Ishikawa diagram was designed to represent all factors affecting utilization of cervical cancer screening among women.

Findings of Literature Review

The factors for cervical cancer screening, reported by the women in various studies were assembled into sociodemographic, knowledge, resource, psychosocial and miscellaneous factors as shown in figure 1. All sociodemographic factors comprised of age, marital status, education, occupation, income and socioeconomic status of the women enrolled in different studies. Likewise, the factors related to knowledge were comprised of unawareness of the cervical cancer, its symptoms and screening test or program and not necessary to avail screening services. Resource factors included lack of facility or source in the area, lack of health insurance, lack of time and financial

reason. Psychosocial factors affecting the utilization of cancer screening included fear of screening method, lack of interest, and discomfiture to undergo the screening.

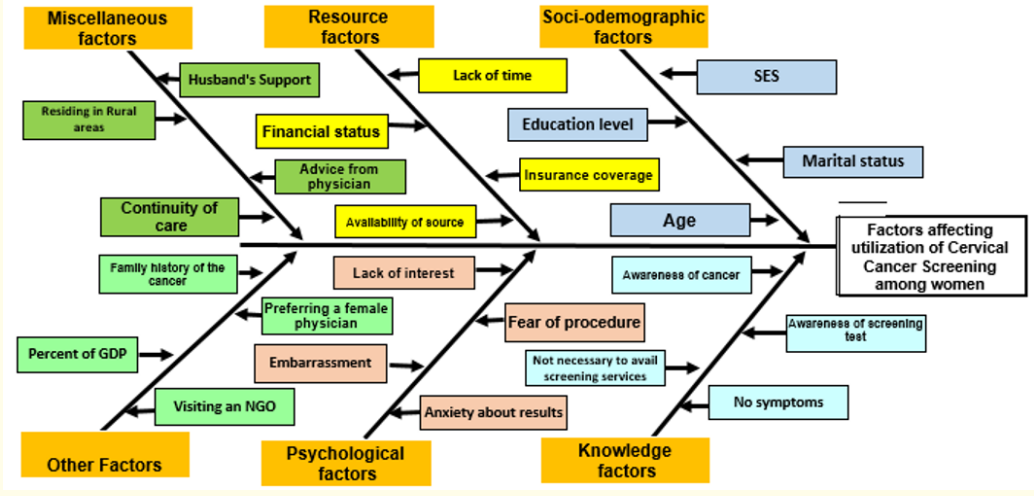

Figure 1: *Ishikawa diagram showing factors affecting utilization of Cervical Cancer Screening among women.*

Sociodemographic factors

Age

Age was found to be an important sociodemographic factor in different studies. There were mixed findings regarding age as an independent factor predicting the screening of cervical cancer [18]. However, most of the studies revealed that younger women are more likely to benefit the screening facilities than the older women. Moreover, evidence-based studies in low resource settings have established that the ideal age for cervical cancer screening to gain the greatest public health impact is from 30 - 39 years [19]. For example, a study was conducted to appraise the sociodemographic factors of adherence to yearly cervical cancer screening in minority women and this study found that older Hispanic women of more than 50 years old were less adherent to annual Pap testing for cervical cancer relative to their counterparts [20]. In another community-based study conducted in Singapore, it was found that the women who had undergone a pap smear were found to be less than 45 years old (prevalence ratio 1.47, 95% confidence interval 1.15 to 1.88) [21]. Another study reported that for all Vietnamese-American women, younger age was found to be related to Pap test receipt [22]. Likewise, one more study conducted among nurses in Singapore found that the likelihood of screening was more among 35 - 40 years old women [23]. Moreover, in a rural community of Kerala, India, it was found that more than 35 years of age, were 3.04 times (CI 1.42 - 6.506) more likely to use cervical screening as compared to their counterparts [24]. In addition, study conducted among multiethnic women found that elderly women (≥ 65 years) were significantly less likely to have ever had (OR = 0.79, 95% CI 0.65 - 0.96) and to have recently had (OR = 0.67, 95% CI 0.57 - 0.79) Pap smears than younger women, adjusting for the other covariates [25]. One more study conducted among urban Southwestern American Indian women found that ≥ 50 years older women were significantly less likely to receive a recent Pap smear as compared to younger women [26]. Analysis of the World Health Survey showed that being younger than 60 years was one of the important factors, significantly increasing the probability of receiving a pelvic exam or pap smear in the past 3 years among 18 to 69-year-old women [27]. On the other hand, another study conducted among Hispanic women (analyses by subgroup) found that being more than 50 years of age was an important predictor of having a pap smear [24]. Similarly, one more study conducted in Vietnamese women in Harris County, Houston, Texas reported contradictory findings and found that older age was found to be the most important determinant of Pap test [28]. Study conducted among Australian women found that women less than 30 and more than 49 years of age were at a higher risk of not obtaining Pap test [29]. A study conducted among immigrant women in Ontario, Canada found that women not being in the 35 - 49 year age group was associated with lack of screening [30].

Marital status

Being married was considered a significant predictor of cervical cancer screening in numerous studies. For example, a study conducted among Hispanic women found that married women were more likely to go for cervical screening relative to unmarried women [24]. Analysis of the World Health Survey found that being single, divorced or widowed was significantly associated with reduced probability of a getting pelvic exam or Pap smear [27]. Likewise, another study conducted in Vietnamese women found that marital status was found to be the most significant predictor of Pap test [28]. Moreover, another study conducted among South Asian women in New York City reported that while running multiple logistic regression analysis, marital status was a found to be predictor of receiving timely Pap test [31]. For all women, being married was associated with Pap test receipt as reported by another study conducted among Vietnamese-American women [22]. Another study conducted among US women found that logistic regression analyses showed that being unmarried was associated with lower rates of Pap test use [32]. One more study conducted among Australian women found that women not presently married were at a more risk of not receiving Pap test [29]. A community-based study conducted in Singapore found that women who have had a Pap smear were more likely to be married than women who did not undergo a Pap test (1.68, 1.21 to 2.31) [21].

Level of education

Most of the studies found the direct relationship between the level of education and inclination towards cervical screening. For example, World Health Survey analysis found that having at least secondary school education increased the probability of receiving a pelvic exam as compared to the illiterate women [27]. Likewise, another study conducted among Vietnamese-American women showed that having a higher level of education was positively associated with Pap test receipt [22]. One more study conducted in Vietnamese women found high education level as one of the most significant predictors of Pap test [28].

Another study conducted among US women reported that while running logistic regression analyses it was found that women having lower educational status were associated with lower Pap test utilization [32]. Similarly, one more study conducted among South Asian women in New York City reported that education was a significant predictor of ever having a Pap test multiple logistic regression analysis indicated [31]. Women having lesser education, were at a higher risk of not receiving and having no knowledge of Pap test, reported by another study conducted among Australian women [29]. One more study conducted in minority women that African American women who had graduated from high school were more likely to be adherent to annual Pap testing [20].

Socioeconomic status

Studies have found that women from higher socioeconomic status (SES) are more likely to obtain cervical cancer screening [33,34]. For instance, World Health Survey analysis found that women living in the lowest SES families were associated with a 43% decrease and women living in the middle SES families were associated with a 33% decline in the probability of getting a pelvic exam/pap smear [27]. Likewise, women who stated having had a Pap smear were belonging to a higher socioeconomic status, thus socioeconomic status remained independent factor in multivariate analysis in a study conducted in Singapore [21]. Women from the highest occupational class had a higher likelihood of cervical cancer screening compared to those in the lowest class, reported by study conducted in the Italy (OR = 1.81; 95% CI = 1.63 - 2.01) [35]. A study conducted among immigrant women in Ontario, Canada found that women residing in the neighborhoods of the lowest-income were significantly associated with lack of screening [30]. Likewise, another study conducted among US women found that women with low family income were associated with lower Pap test use among women under 65 years old women [32]. Similarly, a study done in northern Peru showed that results from logistic regression identified that having higher relative wealth was found to be an important determinant of screening [36].

Knowledge factors

Cervical cancer Knowledge

Knowledge of disease itself was found to be an independent factor for availing screening services. For example, in a rural community of Kerala, India, it was found that women having knowledge related to screening were 2.75 times (95%CI 1.03 - 7.33) likely to use the

cervical cancer screening [37]. In the same study, it was found that the reasons for not receiving the screening test done were mainly lack of awareness, having no symptoms or signs of disease, lack of awareness from where to avail services, and never thought of cervical cancer screening tests [37]. Thus, knowledge factors accounted for 50% of the self-reported factors. Thus, having not knowledge of the disease and absence of the concept of preventive behavior appears to be important factors affecting the utilization of cervical screening tests [37]. Furthermore, the same study found that 37.1% of women reported no symptoms, 11.4% not being aware of the Pap test and 3.1% reported that it is not necessary to avail screening services [37]. Likewise, the qualitative study conducted in Ghana also revealed that majority of the participants had no awareness of cervical cancer or cervical cancer screening tests [38]. Similarly, one study conducted in the USA found that the absence of symptoms and perception of susceptibility determined Pap smear testing among African American and Hispanic women [39].

Knowledge regarding pap smear

Awareness of screening tests such as Pap smear has been reported as an independent factor by studies conducted in different parts of the world. For example, one study conducted in India showed that women with awareness of Pap test were 7.098 times (95% CI 2.99 - 16.79) were more likely to receive screening tests relative to those women having no knowledge of Pap test [37]. Likewise, one more study conducted in Kolkata, India found that women with perceived knowledge of a Pap test ($P < 0.001$) was more likely to avail screening services [18] and having no knowledge of procedure was associated with less use of screening tests, reported by study conducted among urban Southwestern American Indian women [26].

Resource factors

Source of Care

Various study findings showed that the most important single determinant of cervical cancer screening is having access to a standard source of care [33]. Women having access to usual source of care were four or more times likely to report a Pap test as compared to those without usual source of care. Likewise, one more study conducted among Hispanic women found that having a usual source of care was a positive determinant for receiving each of the three screening practices in the last 3 years [24]. A study conducted among multiethnic women found that having a regular source of care predicted screening utilization for both elderly and nonelderly, controlling for other factors such as ethnicity, sociodemographic and health status, access to care, and attitudes towards cancer [25]. Likewise, another study conducted among rural women found that interaction with the health care system is associated with an more utilization of screening services [40]. Moreover, having no knowledge of where to go was also found to be an important obstacle among Hispanic women [41]. Similarly, one more study conducted among urban Southwestern American Indian women showed that inadequate access to health care were important barriers to Pap smear use [26]. In addition, another study conducted among underserved women found that cervical cancer screening practices of African American and Hispanic women were influenced having no access to usual source of health care [39].

Health insurance coverage

Health insurance coverage has been found a significant predictor of utilization of cervical screening in different studies. For example, in one of the study found that lack of health insurance coverage was the most powerful independent factor of low utilization rates for Pap smears (OR = 2.89; 95% CI, 2.17 - 3.85) [42]. Likewise, another study conducted among underserved women found that cervical cancer screening practices of African American and Hispanic women were influenced by lack of insurance [39]. One more study conducted among minority women found that African American women having insurance coverage were more likely to be adherent to annual Pap smear [20]. Having no health insurance coverage was associated with lower Pap test use among women under 65, reported by another study conducted among US women [32]. Likewise, a study conducted among South Asian women in New York City found that insurance status was a significant predictor of ever having a Pap test and receiving timely Pap tests while adjusting for other factors in the logistic regression analysis [31]. A study conducted in India found some other resource factors as predictors of cervical screening such as lack of time (7.3%), the financial reason (5.7%) and lack of facility in the area (1.2%) [37].

Psychological factors

Psychological factors are also considered as important factors for cervical screening among women. For example, the most frequently reported hindrances to screen in Kolkata India included the perception of test being painful, anxiety about results and cost. Some other determinants included being scared of the tests, feeling shy, etc [18]. Similarly, another community-based study in Singapore also reported that anxiety of discomfort and discomfiture were the most important obstacles for women in Singapore having an structured screening programme [43]. Likewise, another study conducted in England found that the most commonly endorsed barriers of cervical screening were embarrassment (29%), intending to go but not getting round to it (21%), fear of pain (14%) and worry about what the test might find (12%) [44]. Likewise, a study conducted among women in a rural community of Kerala, India found that different psychosocial factors were found to be associated with cervical screening including lack of interest (1.2%), fear of procedure (1.2%), and embarrassment (0.4%) [37].

Other factors/miscellaneous

Many studies also reported that there are other miscellaneous factors which are also associated with cervical screening practices among women. For example, one study conducted among Vietnamese-American women found that women requested for Pap test, recommendation made by physician, and preference for a female doctor was associated with intention to get Pap test done [22]. Likewise, another study conducted in Vietnamese women in Harris County, Houston, Texas found that the most significant predictors of Pap test were lack of obstacles, better perception of seriousness and a family history of cancer [28]. Moreover, one more study conducted in among underprivileged Hispanic and African-American women found that continuity of care, affordability, and receiving advice from health care providers regarding a Pap smear were important factors of cervical cancer screening [45]. In addition, another study conducted among US women found that women with no connection with a primary care provider in the past one year were very less likely to have reported a recent Pap test [32]. Studies conducted among immigrant women in Ontario, Canada found that certain variables were significantly associated with lack of screening. These consisted of not being in a primary care patient enrolment model, and not having access to female provider [30].

One more study conducted in northern Peru found some significant determinants of screening such as having knowledge of other screened women, receiving care from a health care provider when ill and satisfaction with services being offered at the health care facility [36]. When an analysis was restricted to women who had experienced screening in the past, two additional factors appeared including having a supportive husband and appearing in an awareness-raising session [36]. Another study conducted among nurses in Singapore found that the likelihood of screening was found to be more among women who had recent experience of medical screening, those who had recently had a specialist consultation, or had a consultation with a gynecologist ($P < 0.001$ for all) [23].

World Health Survey analysis found that visiting a non-governmental organization (NGO) instead of a government or private clinic (OR = 0.33, 0.23 - 0.49) and living in a rural area (OR = 0.44, 0.32 - 0.60) were also related with reduced probability of receiving a pelvic exam/pap smear [27]. Likewise, the same study reported that visiting a traditional health practitioner and having to walk on feet or bike to the health facility were variables associated with decreased probability of a pelvic exam or Pap smear [27]. In addition, the same study also found that one unit increase in country health expenditure (as a % of gross domestic product (GDP)), raised the probability of pelvic exam/pap smear by 50% (OR = 1.50, 1.30 - 1.73) [27]. Moreover, a similar study found that visiting a nurse/midwife at the last health facility visit significantly improved the likelihood of getting a pelvic exam or pap smear in the last 3 years among 18 to 69-year-old women [27].

Another study conducted in low-resource settings found that a single visit or making two visits can decrease the lifetime risk of cervical cancer by 25 and 35% respectively [19]. A study conducted in different races of White, Black and Hispanic women found an inverse association between cigarette smoking and cancer screening. Thus, cigarette smoking is an main indicator of failure to utilize cancer screening tests [33]. This is consistent with preceding research suggesting that persons being engaged in high-risk activities are less likely to follow the cancer screening guidelines [46].

A different study conducted in South African township found that specific health education exercises can encourage women to avail Pap test services [47]. These exercises should include community leaders and other male members in the family. It should not just provide information but also involve a procedure of rebuilding the concepts in the context of women's lives [47].

Conclusion

This literature review found various sociodemographic, resource, psychological and knowledge related factors affecting the utilization of cervical cancer screening among women. Majority of these studies were conducted in developed countries and few studies have been reported from developing countries mainly India. Considering the findings of this literature review, it is concluded that younger married and educated women from higher socioeconomic status who are aware of cervical cancer and Pap test and who have access to the source of care along with coverage of insurance are more likely to utilize the screening tests and programs. Findings suggest a need to increase cervical cancer awareness in the community and to provide access to community-based screening programs. In addition, some type of insurance coverage can also provide an extra edge to utilize the screening services in a given community. In addition, more studies are recommended to be conducted in developing countries to evaluate the factors of cervical screening tests utilization among low resource settings.

Summary

Cervical cancer has been considered as an important public health problem both in developing and developed countries. Despite the availability of screening tools, majority of the women do not seek these services in their locales. Moreover, the proportion of women availing the services in developing countries is much lower as compared to the developed countries. Multiple studies have assessed the factors affecting the utilization of cervical screening programs across the globe. These factors are not synthesized collectively and we appraised these factors in this literature review. Our literature review found different socioeconomic, knowledge related factors, psychological and resource related factors affecting the utilization of cervical screening program among women. In summary we found that younger, married, educated and wealthy women having knowledge of cancer and Pap tests with adequate access to usual source of care were found to utilize the cancer screening programs more as compared to their counterparts. Based on these findings it is recommended to make women aware of cervical cancer and related screening programs by providing easy access to usual source of care in their communities with insurance coverage.

Declarations

Since this was review of literature therefore ethical review and consent is not applicable.

Availability of Data and Materials

All cited articles are available online.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

This study was conceptualized by Savera Aziz Ali (SAA) and Dr. Sumera Aziz Ali critically reviewed the literature critically with SAA before writing the manuscript. Mr. Zahid Abbasi and Dr. Shama Razzaq and Dr. Nadir Suhail also reviewed the literature and provided their intellectual input. All authors have reviewed and approved the final version of the manuscript.

Bibliography

1. Stewart BW and Kleihues P. "World cancer report". IARC press Lyon (2003).

2. Di J., *et al*. "Review of the Cervical Cancer Burden and Population-Based Cervical Cancer Screening in China". *Asian Pacific Journal of Cancer Prevention* 16.17 (2015): 7401-7407.

3. Ferlay J., *et al*. "Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008". *International Journal of Cancer* 127.12 (2010): 2893-2917.

4. Reynoso-Noverón N., *et al*. "Cervical Cancer Epidemiology". Cervical Cancer: Springer (2017): 19-33.

5. Unit EI. "Breakaway: The global burden of cancer-Challenges and opportunities. A report from the Economist Intelligence Unit". The Economist (2009).

6. Goldie SJ., *et al*. "Cost-effectiveness of cervical-cancer screening in five developing countries". *New England Journal of Medicine* 353.20 (2005): 2158-2168.

7. Mittra I. "Breast cancer screening in developing countries". *Preventive Medicine* 53.3 (2011): 121-122.

8. Franco EL., *et al*. "Cervical cancer: epidemiology, prevention and the role of human papillomavirus infection". *Canadian Medical Association Journal* 164.7 (2001): 1017-1025.

9. Castellsagué X. "Natural history and epidemiology of HPV infection and cervical cancer". *Gynecologic Oncology* 110.3 (2008): S4-S7.

10. Blumenthal PD., *et al*. "Cervical cancer prevention: safety, acceptability, and feasibility of a single-visit approach in Accra, Ghana". *American Journal of Obstetrics and Gynecology* 196.4 (2007): 407.e1-e9.

11. Wright Jr TC., *et al*. "Cervical cancer prevention for all the world's women: new approaches offer opportunities and promise". *Diagnostic Cytopathology* 35.12 (2007): 845-848.

12. Gaffikin L., *et al*. "Visual inspection with acetic acid as a cervical cancer test: accuracy validated using latent class analysis". *BMC Medical Research Methodology* 7.1 (2007): 36.

13. Bobdey S., *et al*. "Cancer screening: Should cancer screening be essential component of primary health care in developing countries?" *International Journal of Preventive Medicine* 6 (2015): 56.

14. Kwon HT., *et al*. "A needs assessment of barriers to cervical cancer screening in Vietnamese American health care providers". *Californian Journal of Health Promotion* 4.3 (2006): 146-156.

15. Othman NH and Rebolj M. "Challenges to cervical cancer screening in a developing country: The case of Malaysia". *Asian Pacific Journal of Cancer Prevention* 10.5 (2009): 747-751.

16. Gakidou E., *et al*. "Coverage of cervical cancer screening in 57 countries: low average levels and large inequalities". *PLoS Medicine* 5.6 (2008): e132.

17. Ferlay J., *et al*. GLOBOCAN 2008, cancer incidence and mortality worldwide: IARC cancerbase no. 10. Lyon, France: International Agency for Research on Cancer (2010).

18. Roy B and Tang TS. "Cervical cancer screening in Kolkata, India: Beliefs and predictors of cervical cancer screening among women attending a women's health clinic in Kolkata, India". *Journal of Cancer Education* 23.4 (2008): 253-259.

19. Sherris J., *et al*. "Evidence-based, alternative cervical cancer screening approaches in low-resource settings". *International Perspectives on Sexual and Reproductive Health* 35.3 (2009): 147-152.

20. Jennings-Dozier K and Lawrence D. "Sociodemographic predictors of adherence to annual cervical cancer screening in minority women". *Cancer Nursing* 23.5 (2000): 350-356.

21. Seow A and Lee HP. "Prevalence and determinants of cervical cancer screening: a community-based study in Singapore". *Annals of the Academy of Medicine, Singapore* 23.3 (1994): 342-347.

22. Nguyen TT., *et al*. "Predictors of cervical Pap smear screening awareness, intention, and receipt among Vietnamese-American women". *American Journal of Preventive Medicine* 23.3 (2002): 207-214.

23. Tay K., *et al*. "Factors affecting the uptake of cervical cancer screening among nurses in Singapore". *International Journal of Gynaecology and Obstetrics* 130.3 (2015): 230-234.

24. Zambrana RE., *et al*. "Use of cancer screening practices by Hispanic women: analyses by subgroup". *Preventive Medicine* 29.6 (1999): 466-477.

25. Mandelblatt JS., *et al*. "Breast and cervix cancer screening among multiethnic women: role of age, health, and source of care". *Preventive Medicine* 28.4 (1999): 418-425.

26. Risendal B., *et al*. "Pap smear screening among urban Southwestern American Indian women". *Preventive Medicine* 29.6 (1999): 510-518.

27. Akinyemiju TF. "Socio-economic and health access determinants of breast and cervical cancer screening in low-income countries: analysis of the World Health Survey". *PloS one* 7.11 (2012): e48834.

28. Ho V., *et al*. "Predictors of breast and cervical screening in Vietnamese women in Harris County, Houston, Texas". *Cancer Nursing* 28.2 (2005): 119-129.

29. Siahpush M and Singh GK. "Sociodemographic predictors of pap test receipt, currency and knowledge among Australian women". *Preventive Medicine* 35.4 (2002): 362-368.

30. Lofters AK., *et al*. "Predictors of low cervical cancer screening among immigrant women in Ontario, Canada". *BMC Women's Health* 11.1 (2011): 20.

31. Islam N., *et al*. "Breast and cervical cancer screening among South Asian women in New York City". *Journal of Immigrant and Minority Health* 8.3 (2006): 211-221.

32. Hewitt M., *et al*. "Cervical cancer screening among US women: analyses of the 2000 National Health Interview Survey". *Preventive Medicine* 39.2 (2004): 270-278.

33. Selvin E and Brett KM. "Breast and cervical cancer screening: sociodemographic predictors among White, Black, and Hispanic women". *American Journal of Public Health* 93.4 (2003): 618-623.

34. Makuc DM., *et al*. "Health insurance and cancer screening among women". Advance data 254 (1994): 1.

35. Damiani G., *et al*. "Socioeconomic disparities in the uptake of breast and cervical cancer screening in Italy: a cross sectional study". *BMC Public Health* 12.1 (2012): 99.

36. Winkler J., *et al*. "Women's participation in a cervical cancer screening program in northern Peru". *Health Education Research* 23.1 (2007): 10-24.

37. Aswathy S., *et al*. "Cervical cancer screening: Current knowledge & practice among women in a rural population of Kerala, India". *The Indian Journal of Medical Research* 136.2 (2012): 205-210.

38. Williams MS. "A qualitative assessment of the social cultural factors that influence cervical cancer screening behaviors and the health communication preferences of women in Kumasi, Ghana". *Journal of Cancer Education* 29.3 (2014): 555-562.

39. Ackerson K and Gretebeck K. "Factors influencing cancer screening practices of underserved women". *Journal of the American Academy of Nurse Practitioners* 19.11 (2007): 591-601.

40. Lantz PM., *et al*. "Education and income differentials in breast and cervical cancer screening: policy implications for rural women". *Medical Care* 35.3 (1997): 219-236.

41. Byrd TL., *et al*. "Cervical cancer screening beliefs among young Hispanic women". *Preventive Medicine* 38.2 (2004): 192-197.

42. Rodríguez MA., *et al*. "Breast and cervical cancer screening: impact of health insurance status, ethnicity, and nativity of Latinas". *The Annals of Family Medicine* 3.3 (2005): 235-241.

43. Seow A., *et al*. "Beliefs and attitudes as determinants of cervical cancer screening: a community-based study in Singapore". *Preventive Medicine* 24.2 (1995): 134-141.

44. Waller J., *et al*. "Barriers to cervical cancer screening attendance in England: a population-based survey". *Journal of Medical Screening* 16.4 (2009): 199-204.

45. Bazargan M., *et al*. "Correlates of cervical cancer screening among underserved Hispanic and African-American women". *Preventive Medicine* 39.3 (2004): 465-473.

46. Holm CJ., *et al*. "Health beliefs, health locus of control, and women's mammography behavior". *Cancer Nursing* 22.2 (1999): 149-156.

47. Bradley J., *et al*. "Widening the cervical cancer screening net in a South African township: who are the underserved?" *Health Care for Women International* 25.3 (2004): 227-241.

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