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Barriers and facilitators to cervical screening for Filipino women-a narrative literature review

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Introduction

Cervical cancer, a preventable disease, remains one of the leading causes of death among all women globally (WHO, 2019). The WHO (2019) estimates that of the 311000 deaths from cervical cancer in 2018, more than 85% occur in low income countries with most in the poorest regions, including Sub-Saharan Africa, South America, South-Central Asia and South-East Asia, in which the Philippines is located. In the Philippines cervical cancer is the second most common cancer amongst women after breast cancer (IARC, 2018). Cervical cancer tends to be diagnosed at a late stage amongst Filipino women resulting in proportionally high mortality rates (Domingo and Dy Echo, 2009; Guerrero et al., 2015). Cervical cancer age-world standardised rate (ASR (W)) incidence is estimated at 16 and mortality at 7.5 per 100.000 for the Philippines (IARC, 2018).

Screening for cervical cancer as a secondary prevention method is an effective way of discovering precancerous lesions, meaning the disease is caught at an early stage and treatment of precancerous changes can be offered before malignancy evolves (Everett et al., 2010; WHO, 2019). Globally, access to and utilisation of cervical screening varies widely, representing large inequalities in coverage of cervical cancer screening within and between countries (Gakidou et al., 2008; Ginsburg & Paskett, 2018; Johnson et al., 2018). Cervical screening not being readily available can cause low uptake

(Garland et al., 2008; Guerrero et al., 2015). However, it has been found that cervical screening uptake for migrant women in several countries, including the UK, US, Australia, Canada, Norway and Sweden, is still low despite cervical screening being readily available (Kandula et al., 2006; Amankwah et al., 2009; Ho and Dinh, 2010; Leinonen *et al.,* 2017; Lofters et al., 2011; Lu et al., 2011; Luque et al., 2011; Hou et al., 2012; Olsson et al., 2014; Weber et al., 2014; Idehen et al., 2018) and migrant women are disproportionally affected by cervical cancer (Wiedmeyer et al., 2012; Idehen et al., 2018). Participation rates for cervical screening in Asian-Americans, including Filipinas, are consistently lower than for their white counterparts in the US (Kagawa-Singer and Pourat, 2000; Maxwell et al., 2000; Chen et al., 2004; Wu et al., 2006; Downs et al., 2008; Wang et al., 2008; Yu et al., 2009; Yoo et al., 2011).

Limited research is available on participation rates, knowledge of, or attitudes towards cervical screening for Filipino migrant women. In 2015, 2.34 million overseas Filipino workers were recorded and this number continues to grow; The Philippine Overseas Employment Administration (POEA) reported that every day 3,000 Filipinos leave the country for overseas work (POEA, 2016; Caguio and Lomboy, 2014). If the uptake of cervical screening is to be improved for this population, the first step is to identify the current level of knowledge in the existing literature regarding barriers and facilitators to cervical screening for Filipino migrant women.

Methods

A focused narrative literature review adopting a systematic approach was conducted. Inclusion criteria for this systematic search are presented in Table 1.

Table 1 Inclusion/exclusion criteria

An initial scoping review indicated minimal literature in this area, therefore all types of original research exploring determinants of cervical- and breast-cancer screening as relevant to this project, were included. The inclusion criterion of English language was applied as the researcher was not fluent in Tagalog. Setting the time period of 1995-2019 ensured inclusion of both current evidence and older studies (Aveyard, 2014). No age limitations on the target population were set, because guidelines regarding age of cervical screening vary between countries (Lu et al., 2011). The exclusion criterion of studies targeting Asian but not Filipinas was applied due to cultural differences between Asian subgroups. Although there may be some overlap when examining barriers and facilitators to screening between different types of cancer, studies focused on breast cancer screening alone, or other types of cancer screening, and not focused specifically on cervical cancer

screening may present considerable differences to studies focused on cervical cancer screening (Ko et al., 2004).

Data sources and searches

Electronic data sources which were most relevant to the field and topic are summarised in Table 2. Reference lists of reviews and studies included were hand searched. Three experts in the field were contacted.

Table 2 Data sources

Keywords used were developed according to the SPIDER (Sample, Phenomenon of interest, Design, Evaluation, Research type) technique (Cooke et al., 2012). Keywords and Boolean operators used are presented in Table 3.

Table 3 Keywords used according to SPIDER technique

Literature Search

The search strategy is presented in the flow chart in Figure 1. Initial searches (n=4523) were not sufficiently specific but helpful in the refinement of the search terms according to the SPIDER technique (Table 3). When the SPIDER technique was applied and duplicates were removed, 425 studies were identified. Screening these studies for meeting the inclusion criteria on the basis of abstracts, resulted in 114 studies. These 114 studies were inspected in full, resulting in the exclusion of 94 studies and inclusion of 20 studies. Studies that were excluded were: 1) not focused on the target population; 2) focused on the wrong type of cancer screening; 3) too biomedical in focus and therefore not relevant, for example, focused on the progression of the disease; 4) duplicate version of the same study; 5) not a research study.

Figure 1 Literature search PRISMA flow diagram

Literature Quality Assessment

Due to the heterogeneity of the studies, multiple methods to assess study quality were used. Literature was critically appraised to limit bias using the five existing checklists specified in Table 4.

Table 4 Checklists used for critical appraisal

The number of questions per checklist ranged between 10-13, as specified in Table 4. Each question that was scored positively (yes) was allocated one point. Open questions were scored as 'yes' if these could be answered. If information was not reported, a score of zero was awarded. For example, if ethical considerations were not mentioned, a score of zero was applied.

Data Extraction & Synthesis

Data extraction was applied to the 20 studies that met inclusion criteria. The following information was extracted from each study: type of study, focus of study, type of

screening, location, sample, uptake of cervical screening, and key strengths and limitations.

In order to explore commonalities in key barriers and facilitators across studies, data were narratively synthesised by applying thematic analysis and coding common themes using NVivo qualitative data analysis Software (QSR International PTY Ltd. Version 10 for Mac, 2014). Thematic analysis is a valuable method for synthesising multiple sources of evidence (Dixon-Woods et al., 2005). Major themes were identified through coding of the literature for barriers and facilitators. Themes were decided on by carefully organising barriers and facilitators and considering what the studies were about in relation to the studies' findings, fulfilling the review's aim to identify known barriers and facilitators to cervical screening for the target population, allowing an aggregative synthesis of findings.

Findings

All 20 reported studies were conducted between 1998 and 2016. It was not possible to use one single measurement of quality because different research designs were included in this review: quantitative (survey) design (n=15), qualitative (n=2), intervention studies (n=2), and mixed-methods (n=1) (Table 5).

Table 5 Data extraction and strengths and limitations of the 20 included studies

Barriers and Facilitators to cervical screening for Filipinas in the included studies

Known barriers and facilitators regarding cervical screening for Filipinas are summarised in Table 6 and grouped into five main themes: demographic, cognitive, access, healthcare provider and cultural factors.

Table 6 Barriers and Facilitators to cervical screening for Filipinas in the included studies

Barriers and facilitators to cervical screening: Demographic factors

Several demographic factors were associated with cervical screening. Maxwell et al. (2000) used 'time spent in the US' as a proxy for acculturation, which was highly correlated with education. The longer Filipinas had spent in the US, the more likely they were to adhere to cervical screening guidelines. This is also confirmed by Kandula et al. (2006), Chawla et al. (2015), McDonald and Kennedy (2007), Lee et al. (2010) and Shoemaker & White's (2016) research. Low socio-economic status (Holroyd et al., 2003; Lee et al., 2010), specifically education (McDonald and Kennedy, 2007; Sentell et al., 2015) and increased age (McBride et al., 1998) were found to act as barriers to cervical screening, although other studies found increased age to act as a facilitator, albeit at a decreased rate (McDonald and Kennedy, 2007; Sentell et al., 2015). Marital status was found to be a facilitator and some authors suggest targeting non-married women specifically to increase the uptake of cervical screening (Kagawa-Singer et al., 2007; McDonald and Kennedy, 2007; Ho and Dinh, 2010; Sentell et al., 2015, Lee et al., 2010).

Barriers and facilitators to cervical screening: Cognitive Factors

Cognitive factors, such as knowledge and health beliefs, were discussed and linked to participation rates in nine studies (Maxwell et al., 2000; Holroyd et al., 2001; Fu et al., 2003; Holroyd et al., 2003; Kandula et al., 2006; Aitaoto et al., 2009; Ayres et al., 2010; Gor et al., 2011; Yoo et al., 2011). Sentell et al. (2015) found low health literacy, as measured by self-reported understanding of print health-related materials, was significantly related to cervical screening. Lack of knowledge can be an important determinant of cervical screening (Ayres et al., 2010); however, basic knowledge of cervical screening was found in two studies (Holroyd et al., 2003; Yoo et al., 2011). In Holroyd et al.'s (2003) quantitative study in Hong Kong with 98 Filipino domestic workers, despite 53% reported never having participated in pap-testing, 78% of women had heard of pap-testing, although lack of thorough knowledge was found. This presence of basic knowledge suggests that barriers other than knowledge alone were important determinants. Other cognitive barriers found were 'not having symptoms' (Kandula et al., 2006) as well as perceived susceptibility, seriousness of the illness, and benefits of screening (Holroyd et al., 2001).

Barriers and facilitators to cervical screening: Access factors

Accessibility barriers such as health insurance, cost, transportation and lack of time were reported as important barriers to screening in eight of the studies (McBride et al., 1998; Kagawa-Singer and Pourat, 2000; Holroyd et al., 2001; Fu et al., 2003; Holroyd et al., 2003; Shoemaker and White, 2016; Aitaoto et al., 2009; Lee et al., 2010). Holroyd's studies set in Hong Kong, found that women reported having limited time due to long working hours and only one day per week off, usually when healthcare clinics are closed, and women were allowed limited opportunity to attend clinics for testing (Holroyd et al., 2001; 2003). This finding was supported in focus groups with Filipino women in Hawaii (Aitaoto et al., 2009).

Barriers and facilitators to cervical screening: Healthcare Provider Factors

Having a regular healthcare provider (HCP), HCP recommendation assistance, reminder notices and culturally appropriate HCPs were found to be important factors in cervical screening in seven studies (McBride et al., 1998; Maxwell et al., 2000; Fu et al., 2003; Kagawa-Singer et al., 2006; Kandula et al., 2006; Kagawa-Singer et al., 2007; Gor et al., 2011, Lee et al., 2010). Communication with HCPs may be an important part of the decision to engage in cervical screening (Fu et al., 2003; Aitaoto et al., 2009; Gor et al., 2011). HCPs may be aware of cultural sensitivities, such as modesty or embarrassment,

around cervical screening for Asian women and therefore less likely to offer them screening (Maxwell et al., 2000). For Filipinos, communicating in a way that is karinosa (meaning that one talks in a warm and caring manner), is an important way of connecting with one another and a touch on the arm or a hug can convey support and comfort (Fu et al., 2003). Filipinas were found to believe that health messages are most effectively conveyed by someone from their own culture in order to understand their cultural particularities and to build trust (Fu et al., 2003; Aitaoto et al., 2009). Filipinos tend to relate to people rather than to organisations or institutions hence they would rather attend a clinic where they would already know someone (Fu et al., 2003; Aitaoto et al., 2009). Building trust between Filipinos and HCPs seems an essential factor in developing good relationships (Fu et al., 2003). Filipinas preferred a female HCP, especially for intrusive procedures such as cervical screening (McBride et al., 1998).

Barriers and facilitators to cervical screening: Cultural Factors

Cultural factors may help explain disparities in uptake of cervical screening and these cultural factors have been identified as significant barriers to cervical screening (Wang et al., 2008). Cultural barriers that were reported by five studies include embarrassment, modesty, the value of virginity and a sexually charged meaning to cervical screening

discouraging women to go for cervical screening (McBride et al., 1998; Kagawa-Singer and Pourat, 2000; Holroyd et al., 2003; Chen et al., 2004; Gor et al., 2011).

In five of the studies, the collective nature of Filipino culture was discussed (Holroyd et al., 2001; Fu et al., 2003; Maxwell et al., 2003; McDonald and Kennedy, 2007; Aitaoto et al., 2009). Collective communities are characterised by a common set of values, a sense of belonging as part of the community, caring for community members and offering a sense of security to community members. Stepping out of a close community as a migrant may therefore bring a sense of loss of identity and be a stressful experience (Tejero and Fowler, 2012; van der Ham et al., 2014). The feeling that staying healthy for the benefit of family acted as a facilitator to health behaviour and cervical screening (Maxwell et al., 2003). However, it also enhanced worry and not wanting to hear bad news was found to act as a barrier to cervical screening (Aitaoto et al., 2009).

The collective characteristics of the Filipino population can also work as a facilitator in terms of peer encouragement and women who have friends or family who have attended cervical screening were found more likely to also attend (Holroyd et al., 2001; Fu et al., 2003; Aitaoto et al., 2009). Related to this collective culture is the role of women and it was found that decisions regarding health behaviour are often made in collaboration with their husband; support from males was mentioned as a facilitator by two studies (McBride et al., 1998; Gor et al., 2011).

Another cultural barrier to cervical screening that Filipino migrant women report is language barriers making access to health care and health care materials problematic (McBride et al., 1998; Fu et al., 2003; Kagawa-Singer et al., 2007). Language is a catalyst as well as outcome of acculturation. Acculturation has been defined as, 'the process that may occur when two cultures interact' (Ayres et al., 2010 p.199), meaning that when migrants move to a new country they may adopt attitudes, beliefs and practices common in the host-country. This process of acculturation is likely to be confusing and conflicting, impacting on physical and mental health in positive as well as negative ways (Ayres et al., 2010). Acculturation may be related to harmful behaviours such as smoking or poor diet however acculturation was also found a predictor of preventative health behaviour (Ayres et al., 2010). Acculturation to western society was found a facilitator to cervical screening (McBride et al., 1998; Maxwell et al., 2000; Holroyd et al., 2001). Less acculturation and less time in the US were significantly associated with lower rates of cervical screening (McBride et al., 1998). Younger women's lower rates of cervical screening were associated with stronger beliefs of modesty and traditional gender roles, older women's lower rates of cervical screening were related to less use of English and traditional health beliefs such as believing in traditional healer's ability to cure illness (hilot or herbolario) or the power of a witch or sorcerer (mangkukulam) to cause illness (McBride et al., 1998).

Highlighting differences between Asian cultures and the need to study these separately is the fact that of all Asian countries, the Philippines is the only country in which Catholicism is the predominant religion for approximately 85% of the population (Lagman et al., 2014). For many Filipinos, religion is intertwined within their culture, identifying meanings of identity, family, community and how they interact with society (Lagman et al., 2014). Only three studies included religion as a factor related to cervical screening although it was found that Filipinas appreciate receiving health advice from their church community (Holroyd et al., 2001; Aitaoto et al., 2009; Gor et al., 2011).

Quality Assessment

Methodological weaknesses in the extant literature were related to: lack of comprehensive methodological reporting; low response rate or response rate not being reported; conclusions extrapolated beyond results; focus on limited barriers and facilitators; sampling approach such as convenience or snowball sampling used, and lack of external validity. Quality assessment scores were relatively high, ranging between 3-10 with a mean score of 7.5 (Table 5). Only two studies scored low (3) due to lack of reporting. Only five studies used the Filipino language (Tagalog) in their data collection (McBride et al., 1998; Maxwell et al., 2000; Fu et al., 2003; Wu et al., 2006; Aitaoto et al., 2009). Other studies used either English or other Asian languages which may result in selection

bias by including only those Filipinas fluent in English (Chen et al., 2004). Other than Holroyd's two Hong Kong studies (2001, 2003) and one Canadian study (McDonald and Kennedy, 2007), the remaining 17 studies were set in the US and findings may not be transferable to Filipino migrant women in different contexts and healthcare systems. For example, Filipino-American women are included in the US cancer screening programs, which may not apply to Filipino migrant workers in different contexts due to their temporary status. Although the US is the top one destination for Filipino immigration, the US is not included in the top ten destinations for overseas Filipino workers (IOM, 2013; POEA, 2016). Other methodological issues identified in the literature review were related to small sample size limiting the possibility of generalisability. A major limitation is that most data are self-reported which may be subject to recall bias, possibly resulting in over-reporting (Maxwell et al., 2003; Lu et al., 2011).

Discussion

The review presented an overview of barriers and facilitators to cervical screening for Filipinas as found in the literature. Data from 20 studies were synthesised and main barriers and facilitators to cervical screening were grouped into five main themes: demographic, cognitive, access, healthcare provider and cultural factors to cervical screening. None of the included studies focused on all five factors. This limited focus in

variables has an impact on the effectiveness of interventions aimed at increasing uptake of screening if barriers and facilitators are not all addressed. Only two of the 20 studies were intervention studies of which one was an experimental case study of a pilot intervention (Fu et al., 2003), which had a low methodological quality score (3). The other intervention study was a RCT with 447 Filipinas in the US (Maxwell et al., 2003), which offered health education regarding cancer screening to a group of Filipino-American women (all but one foreign born) and a physical activity module to the control group. Cultural aspects including collectivism were also addressed in the health education. No significant increase in screening rates at 12-months follow-up were found. Maxwell et al. (2003) suggested that this lack of significant results was partially due to omission of accessibility barriers to screening from the study.

Barriers and facilitators found in this literature review were comparable to barriers and facilitators described in the literature for other Asian migrant women. Half of the studies included in the review mentioned that an important limitation to existing literature is that often Asian women are taken as one group, implying they might be experiencing similar cultural barriers. Although some cultural barriers and facilitators may be similar, some may not or the importance that each group awards to those factors may vary (McBride et al., 1998; Fu et al., 2003).

Although some research is available for Asian migrant women, mostly in the US, scarce research has been conducted for each national group separately, especially Filipinas.

Asian Americans and Pacific Islanders (AAPI) communities may consist of 50 different ethnicities and more than 100 different languages (Fu et al., 2003; Hou et al., 2012). Aggregation of all these groups and assuming they experience similar barriers and facilitators would mean ignoring the richness of each culture by itself (Maxwell et al., 2000; Kagawa-Singer et al., 2007; Hou et al., 2012). Aggregating incidence and mortality data for cervical cancer may mask those national groups more at risk and limit the potential for developing culturally-specific interventions and improving health outcomes (Fu et al., 2003).

There were limitations to this review. Only literature in English could be searched which means some literature may have been omitted. Due to heterogeneity of research designs and therefore different foci and checklists used, identifying one measure for methodological quality was not possible. Using individual scores from the checklists was nevertheless useful in providing a proxy of quality. For future research, multidimensional quality scales for a range of research designs would be helpful to assess methodological quality.

Conclusion and Implications for research and practice

Few studies concerning Filipino migrant women and cervical screening were found; only two studies specifically explored cervical screening with Filipino migrant women outside the US and most studies were quantitative. Further exploratory research should be conducted with Filipino migrant women in different locations regarding cervical screening and studies in the US may not be comparable to Filipino migrant women elsewhere. Although investigating participation rates for Filipino migrant women is vital, research focused on gaining a deeper understanding of barriers and facilitators is needed. This will increase further understanding and have greater potential for developing culturally appropriate interventions. Cervical screening for Asian subgroups requires separate research for each group due to cultural differences between groups and important factors for each are potentially masked by aggregating data.

Different studies apply different foci, including some relevant factors that may act as barriers or facilitators to screening, however no studies included all factors. It is important to gain a comprehensive understanding of what barriers and facilitators to cervical screening Filipino migrant women may experience. Cervical screening for migrant women is a complex topic and influenced by a multitude of factors. Only with a complex understanding of all barriers and facilitators can culturally appropriate interventions be developed for Filipino migrant women, which should ultimately improve their health outcomes.

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Table 1 Inclusion/exclusion criteria

Inclusion criteria	
Sample	Filipino migrant women, Asian migrant women including Filipinas, Overseas Filipino workers
Phenomenon of Interest	Cervical cancer screening, cervical and breast cancer screening with target population
Location	Global
Design	Qualitative, quantitative, mixed-methods
Evaluation	Outcomes such as participation rates, and/or knowledge, perspectives, barriers, facilitators
Publication:	Publications in peer-reviewed journals. Grey literature (conference papers and non-published materials, dissertations and theses)
Language:	English
Dates:	Data collected between 1995 and 2019 (inclusive)
Exclusion criteria	
Sample	Asian women excluding Filipinas
Phenomenon of Interest	Screening not focused on cervical cancer screening

Table 2 Data sources

Data sources	
Databases used	Pubmed, CINAHL, Medline (EBSCO), Web of Science International Bibliography of the Social sciences (IBSS), One Search Lancaster University library.
Systematic review databases	Cochrane, UK National Health Service Centre for Reviews and Dissemination (CRD), NICE
Other electronic searchers	Google scholar
Hand searches	Reference lists of all included articles were hand searched.
Non-published materials	• Three experts were contacted to enquire regarding non-published materials.
Grey literature	• Proceedings of cancer conferences were searched on The National Cancer Institute of the US (www.nci.nih.gov)

Table 3 Keywords used according to SPIDER technique

SPIDER	Search Term
S-Sample	"Filipin*" OR "Asia*" OR "Southeast Asia*" OR "migrant* women" OR "immigrant* women" OR "migrant workers*" OR "migrant*" OR "Philippines*" OR "overseas worker*"
PI-Phenomenon of Interest	"Cervical screening*" OR "Pap test*" OR "Pap*" OR "cancer screening*" or "Human papillomavirus*" or "HPV*"
D-Design	"Questionnaire*" OR "survey*" OR "interview*" OR "focus group*" OR "case study*" OR "observ*" OR "review*" OR "intervention*"
E-Evaluation	"Barrier*" OR "facilitator*" OR "challenge*" OR "attitude*" OR "knowledge*" OR "awareness*" OR "perce*" OR "belie*" OR "view*" OR "understand*" OR "feel*" OR "practice*"
R-Research Type	"Qualitative*" OR "quantitative*" OR "mixed method*" OR "review*"

Table 4 Checklists used for critical appraisal

Checklists used:
1) Checklist for survey studies (Greenhalgh, 2010) (11 questions) 2) Checklist for qualitative studies (10 questions) (University of Glasgow, Institute of Health and Wellbeing, 2015) 3) Checklist for educational interventions (13 questions) (University of Glasgow, Institute of Health and Wellbeing, 2015) 4) Critical Appraisal Skills Programme (CASP) checklist for Randomised Control Trials (11 questions) (CASP, 2013) 5) Mixed-methods appraisal tool (MMAT) (11 questions) (Pace et al., 2012)

Table 5 Data extraction and strengths and limitations of the 20 included studies

Author	Type & Focus of study	Screening	Location	Sample	Uptake of cervical screening (ever had a pap-test)	Quality Assessment Score	Key Strengths	Key Limitations
	Intervention studies					**CASP checklist for Randomised Control Trials (11 questions)** (CASP 2013)		
Maxwell et al. (2003)	Randomised controlled trial to increase uptake of cervical screening	Breast and cervical	US	447 Filipino women (446 foreign born)	84% ever had pap-test at baseline, 42% in the past year. At 3-month follow up 42% had a pap-test in the past year, at 12-month follow up 54% of women had a pap-test in the past year (12% increase from baseline P<0.0001)	(9)	RCT, response rate high, conducted in Tagalog and English	Some pragmatic barriers were not addressed, possible lack of generalisabilty due to convenience sampling and women were paid for taking part
						Checklists for educational interventions (13 questions) (University of Glasgow)		
Fu et al. (2003)	Case study of an experimental Intervention-pilot to increase uptake of cervical screening	Breast and cervical	Hawaii (US)	118 Filipinas	Not specified	(3)	Informative case study	Lack of transparency in methodology

	Mixed-methods design					**MMAT (11 questions) (Pace, 2012)**		
McBride et al. (1998)	Mixed-methods. Focus on investigating participation rates and factors related to screening	Cervical	US	22 Filipinas for individual interviews, 6 focus groups, focus groups including males and physicians. Survey with 875 Filipino women.	88%	(8)	Appropriate language choice, mixed methodology, large sample size, qualitative phase enhanced internal validity	Response rate not reported, older study
	Quantitative-survey design All survey design studies were focused on participation rates and factors related to uptake of screening					**Checklist for survey studies (11 questions) (Greenhalgh, 2010)**		
Holroyd et al. (2003)	Cross sectional survey	Cervical	Hong Kong	98 Filipino domestic workers	47%	(9)	Clearly reported study with population outside US	Small sample size and not conducted in Tagalog
Kagawa-Singer, M. et al., (2007)	Population based survey data from 2001 California Health interview Study	Breast and cervical	US	Chinese- (711), Filipina- (488), south Asian- (356), Korean- (457), Vietnamese- & Cambodian- (475) and Japanese- (413) Americans	Filipinas: 81% (2 years previously)	(8)	Large sample size, standardised instrument, appropriate sampling strategy	Not conducted in Tagalog
Wang et al. (2008)	Cross-sectional survey	Cervical	US	Non-Hispanic White (n=2146) and Asian American women (including Chinese,	Filipinas: 81%	(9)	Randomised digit dialling method, standardised data	Filipino sample relatively small, not conducted in Tagalog

				Vietnamese, Korean, Filipino and Japanese (n=259)				
Yoo et al. (2011)	Cross-sectional survey	Cervical	US	304 Asian women aged 18-28 (100 Vietnamese, 104 Filipino, 100 Korean).	Filipinas: 48%	(7)	Segregated data	Sample young (18-28), response rate not reported, confidence intervals wide, attitudes receive limited attention
Holroyd et al. (2001)	Survey	Health related behaviours including cervical screening	Hong Kong	290 Filipino domestic workers	21.7%	(9)	Clearly reported study with population outside US, validated scales although all in English, the pilot showed this was appropriate	Response rate and recruitment not reported
Ayres et al. (2010)	Survey	Cervical	US	89 Filipinas (aged 18-21)	38.5%	(3)		Convenience sample of 89 Filipino women aged 18-21. Sample size small and age is young
Maxwell et al. (2000)	Cross sectional survey	Cervical, breast and colorectal	US	218 Filipino-, 229 Korean-women	Filipinas: 84%	(8)	Questionnaires were not standardised however developed based on focus groups and translated into Tagalog	Convenience sample, limited variables included
Chen et al. (2004)	Population based from the Los Angeles County Health Survey 2001-2002	Breast and cervical	US	383 AAPIs Filipinas (82), Japanese (62), Koreans (59),	Filipinas: 78%	(8)	Standardised data-used random digit-	Not in Tagalog, sample size small, some groups were

				Chinese (126), Indian (13), Pacific Islander (Samoans, Guamanians, Hawaiians) (25), South-east Asian (Laotians, Cambodians, Vietnamese) (25)			dialling technique	combined for purpose of analysis
Kandula et al. (2006)	Population-based survey (data from 2001 California Health interview Study)	Colorectal, cervical and breast	US	36660 non-Hispanic white, 944 Filipinos, 857 Vietnamese, 803 Koreans, 1036 other Asians.	Filipinas: 81%	(10)	Random digit dial population based sample, large sample, different Asian languages used	Not conducted in Tagalog
Kagawa-Singer & Pourat (2000)	Population-based survey (Healthy People 2000) data 1993-1994	Cervical and breast	US	528 non-Hispanic AAPI (including 123 Filipinas)- 17,373 non-Hispanic white women	Filipinas: 95.4%	(8)	Population based data, standardised survey, large sample	Not conducted in Tagalog, data from 1993-1994 and dated
Shoemaker & White (2016)	Population-based survey (data from National health Interview Survey 2008, 2010, 2013)	Cervical and breast	US	2007 Asian American (including 345 Asian Indian, 440 Chinese, 510 Filipina, 712 'other Asian')	Filipinas: 82.7%	(8)	Population based data, standardised survey, large sample	Not available in Tagalog, or other Asian languages, English and Spanish only. Data from different years is combined.

Chawla et al. (2015)	Population-based survey (data from California Health Interview Survey 2001, 2003, 2005, 2007, 2009)	Cervical and breast	US	7865 Asian American (2344 Chinese, 1466 Filipino, 737 Japanese, 1166 Korean, 711 South Asian)	Filipinas: 82.2% (2007)	(8)	Random digit dial population based sample, standardised survey, large sample	Not available in Tagalog (but in Cantonese, Mandarin, Korean, Vietnamese, English and Spanish).
Sentell et al. (2015)	Population-based survey (data from California Health Interview Survey 2007)	Cervical and breast	US	15,210 (cervical) (sample sizes not specified for each ethnic group)	Filipinas: 79.5%	(8)	Random digit dial population based sample, standardised survey, large sample	Not available in Tagalog (but in Cantonese, Mandarin, Korean, Vietnamese, English and Spanish).
Lee et al. (2010)	Population-based survey (data from California Health Interview Survey 2001,2003, 2005)	Cervical and Breast	US	51,377 Non Latina white, 1182 Filipino, 2161 Chinese, 685 Japanese, 1152 Korean, Vietnamese 903, 540 South Asian	Filipinas: 88%	(8)	Random digit dial population based sample, standardised survey, large sample	Not available in Tagalog (but in Cantonese, Mandarin, Korean, Vietnamese, English and Spanish).
McDonald and Kennedy (2007)	Population-based survey 1996 National Population health survey and 2000-2001 and 2002-2003 Canadian Community Health Survey	Cervical	Canada	105062 women age 21-65 (sample sizes not specified for each ethnic group)	Filipinas (foreign born): 62.8%	(7)	Population based data, standardised survey, large sample	Sample sizes not specified for each ethnic group, sampling not discussed, languages data collection not discussed.
	Qualitative design					**Checklists for qualitative studies (10 questions) (University of Glasgow)**		
Gor, B.J. et al., (2011)	Focus groups-focus on awareness of and attitude to cervical	Cervical	US	48 low income Vietnamese,	Filipinas: 70%	(3)		Qualitative focus and

	screening of both males and females			Filipino and Korean				analysis is lacking
Aitaoto et al. (2009)	Focus groups- focus on in-depth understanding of barriers and facilitators to uptake of screening	Breast and cervical	Hawaii (US)	42 Filipina, Hawaiian and other American Pacific Islander women, (42 women in total ranging in age 42-69), 18 health workers	Filipinas: 73%	(8)	Qualitative approach appropriate and provided important insights. Ilocano, different Filipino language, used	Lack of detail on analysis and recruitment

Table 6 Barriers and Facilitators to cervical screening for Filipinas in the included studies

Studies	Barrier to cervical screening	Facilitator to cervical screening
	Demographic Factors	
Kagawa-Singer et al. (2007), McDonald and Kennedy (2007), Sentell et al. (2015), Lee et al. (2010)		Marital Status: married
Yoo et al. (2011), McBride et al. (1998), Kagawa-Singer et al. (2007), McDonald and Kennedy (2007), Sentell et al. (2015)	Increased age	Increased age
Kagawa-Singer et al. (2000), McDonald and Kennedy (2007), Lee et al. (2010)	Lower socio-economic status	
Yoo et al. (2011), McBride et al. (1998), Kandula et al. (2006), Maxwell et al. (2000), Maxwell et al. (2003), Chawla et al. (2015); Shoemaker & White (2016), McDonald and Kennedy (2007), Lee et al. (2010)	Less time spent in new country	
	Cognitive Factors	
Holroyd et al. (2001), Holroyd et al. (2003), Gor et al. (2011), Aitaoto et al. (2009), Ayres et al. (2010), Yoo et al. (2011), Sentell et al. (2015)	Lack of knowledge and awareness	
Holroyd et al. (2003)	Low perceived susceptibility Low belief of efficacy Low perceived severity Low perceived benefits	
Holroyd et al. (2003)		
Fu et al. (2003), Aitaoto et al. (2009), Gor et al. (2011), Holroyd et al. (2003)	Fear of outcome	
Holroyd et al. (2003), Yoo et al. (2011),	Fear of the procedure	
Holroyd et al. (2003), Kandula et al. (2006), Maxwell et al. (2000)	Lack of Symptoms	
	Access Factors	
Aitaoto et al. (2009). McBride et al. (1998), Kagawa-Singer et al. (2000), Shoemaker & White (2016), Sentell et al. (2015), Lee et al. (2010)	Lack of Health Insurance	
Holroyd et al. (2003), Holroyd et al. (2001)	Cost	
Fu et al. (2003), Aitaoto et al. (2009)	Lack of transportation	
Holroyd et al. (2003), Fu et al. (2003), Aitaoto et al. (2009), Holroyd et al. (2001)	Lack of time	
Holroyd et al. (2001)	Not knowing where to go	
Aitaoto et al. (2009)	Difficult to make an appointment	

	HealthCare Provider (HCP) Factors	
Kandula et al. (2006), Kagawa-Singer et al. (2007), Maxwell et al. (2000)		HCP recommendation
McBride et al. (1998),		Gender Appropriate HCP
Fu et al. (2003), Gor et al. (2011)		Culturally appropriate HCP
Kagawa-Singer et al. (2007), Holroyd et al. (2003), Aitaoto et al. (2009), Shoemaker & White (2016)		Regular HCP
Fu et al. (2003), Aitaoto et al. (2009), Gor et al. (2011)		Communication with the HCP
McBride et al. (1998), Chen et al. (2004), Aitaoto et al. (2009), Fu et al. (2003), Gor et al. (2011), Sentell et al. (2015)		Language and culturally appropriate materials
Aitaoto et al. (2009), Fu et al. (2003)		Use of Lay Health Workers speaking same language
Aitaoto et al. (2009)		Cultural awareness training for HCPs
Aitaoto et al. (2009), Holroyd et al. (2001), Kagawa-Singer et al. (2000), Lee et al. (2010)	Lack of regular HCP	
	Cultural factors	
Wang et al. (2008), Holroyd et al. (2001), Holroyd et al. (2003),	Personal fate or luck	
Holroyd et al. (2003), Chen et al. (2004)	Embarrassment	
Kagawa-Singer et al. (2007), McBride et al. (1998), Gor et al. (2011), Holroyd et al. (2003)	Modesty	
Kagawa-Singer et al. (2007), McBride et al. (1998)	Value of virginity	
Kagawa-Singer et al. (2007), Fu et al. (2003), McBride et al. (1998), McDonald and Kennedy (2007), Sentell et al. (2015)	Language barriers	
Gor et al. (2011), McBride et al. (1998)		Support from male relatives
Holroyd et al. (2001), Gor et al. (2011)	Religion	Religion
Aitaoto et al. (2009)		Encouragement from church leaders or community
Holroyd et al. (2001), McBride et al. (1998), Maxwell et al. (2000),		Acculturation
Aitaoto et al. (2009), Fu et al. (2003), McDonald and Kennedy (2007)	Collective culture, lack of family to accompany to clinic for linguistic, cultural and emotional support	Collective culture- Peer encouragement
Maxwell et al. (2005), Aitaoto et al. (2009)		Collective culture-Staying healthy for family and friends
McBride et al. (1998)	Traditional health beliefs	

Figure 1 Literature search PRISMA flow diagram