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Increasing Cervical Cancer Screening Among US Hispanics/Latinas: A Qualitative Systematic Review

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Abstract

Purpose—Hispanic/Latina women experience the highest cervical cancer incidence rates of any racial/ethnic group in the United States (US), and tend to present with more severe cases and experience higher mortality compared to most other populations. The goal of this qualitative systematic review was to explore existing interventions to increase cervical cancer screening among US Hispanics/Latinas and to identify characteristics of effective interventions and research gaps.

Materials and Methods—Six online databases were searched from their inception through June 30, 2013, using designated search terms and keywords. Peer-reviewed articles that documented an intervention designed to improve screening for cervical cancer among Hispanics/Latinas ages 18 years and older living in the US were reviewed. Data were abstracted using a standardized form to document intervention characteristics and results.

Results—Forty-five articles, describing 32 unique interventions, met inclusion criteria. Identified interventions consisted primarily of educational programs and/or provision of screening. Interventions used lay health advisors (LHAs), clinic-based outreach/delivery strategies, partnerships with churches, and mass media campaigns. Twelve interventions resulted in significant increases in cervical cancer screening rates.

Conclusions—Interventions developed utilizing theory, applying community-based participatory research approaches, and using lay health advisors were identified as having the greatest potential for improving cervical cancer screening among Hispanics/Latinas. There continues to be a need for the development of interventions in geographic areas with new and emerging Hispanic/Latino populations and that are comprehensive, follow participants for longer periods of time, and broaden the roles and build the capacities of LHAs.

INTRODUCTION

As the largest and fastest growing minority group in the United States (US), attention to the health needs of the Hispanic/Latino population is critical [1, 2]. Of particular concern among Hispanic/Latina women are disproportionately high rates of cervical cancer incidence and mortality. Hispanic/Latina women experience one of the highest cervical cancer incidence rates of any racial/ethnic group; nearly double that of non-Hispanic/Latina white women [3]. In addition, Hispanics/Latinas tend to present with more severe cases of cervical cancer [4] and experience higher mortality rates (3.0/100,000) compared to other populations (2.1/100,000 for non-Hispanic/Latina whites) [3].

Such poor cervical cancer outcomes among Hispanics/Latinas can, in part, be attributed to low rates of screening [5, 6] and follow-up after abnormal cervical cancer screening results [3, 7]. Cervical cancer is typically preventable if pre-cancerous lesions are detected and treated early. Therefore, regular cervical cancer screening and follow-up are critical. Current recommendations indicate that women should have regular cervical cancer screening starting at age 21 through at least age 65. Women ages 21 to 29 at average risk should be screened using a Pap test every three years. Women ages 30 years and older should continue to receive Pap tests every three years or should receive co-testing (a Pap test with HPV test) every five years [3]. It is estimated that 88% of Hispanics/Latinas in the US have ever had cervical cancer screening compared to 95% of non-Hispanic/Latina whites [4]; similarly, as of 2010, 74.7% of Hispanics/Latinas compared to 79.1% of non-Hispanic/Latina whites reported receiving cervical cancer screening in the previous three years [3]. Furthermore, cervical cancer screening rates are 25–40% lower among foreign-born Hispanics/Latinas (particularly those born in Mexico and Central America) compared to Hispanics/Latinas born in the US [8]. Lower adherence to cervical cancer screening recommendations, including lower rates of cervical cancer screening, knowing one's screening results, and follow-up after an abnormal or inconclusive screening, contribute to greater cervical cancer mortality among Hispanics/Latinas, with recently immigrated and uninsured Hispanics/Latinas at greatest risk [9, 10].

Barriers to cervical cancer screening among Hispanics/Latinas are numerous and include individual-, socio-cultural-, and systems-level factors. Individual-level factors influencing screening behaviors among Hispanics/Latinas include lack of understanding of cervical cancer etiology and prevention, including HPV vaccination, and poor awareness of health screening services and treatment options [11–20]. Research also suggests that some Hispanics/Latinas may have low levels of self-efficacy related to communication with healthcare providers and sexual partners, which may affect adherence to screening recommendations [12, 15]. Embarrassment, fear of pain, hopelessness surrounding a possible cancer diagnosis, and concerns about deportation have also been identified as negatively impacting screening [5, 21, 22]. Distrust of the healthcare system and providers [23–26], low levels of acculturation [27], low educational attainment [28, 29], foreign birth, low income, and language constraints [5, 30] are also relevant barriers for Hispanics/Latinas.

Hispanic/Latino cultural beliefs and social norms also may affect cervical cancer screening behaviors. Dignity, respect, and fatalism are attributes that may affect cervical cancer

screening. For example, if Hispanics/Latinas feel that their dignity is threatened during screening [31] or if they are concerned that asking questions and being assertive with healthcare providers may be regarded as disrespectful [12, 31–33], they may be less likely to seek cervical cancer screening, understand the importance of cervical cancer screening, receive their screening results, and seek follow-up care as warranted. Fatalism may similarly affect screening, as some Hispanics/Latinas may believe that cancer is not preventable [34, 35]. Traditional gender roles that encourage some women to remain pure, endure suffering, and be obedient to men, combined with *machismo*, which prescribes men to be perceived as powerful and appear dominant [31, 36–38], may dissuade Hispanics/Latinas from discussing sex and sexual health. This dynamic may result in some Hispanics/Latinas feeling less powerful in their relationships with partners [23, 32, 39–41] and healthcare providers [42]. Such gender roles also may be detrimental if male partners are uncomfortable with women attending gynecological exams [42].

Further, system-level barriers such as access to health services, lack of health insurance, and limited transportation and childcare options can also affect cervical cancer screening behaviors [4, 5].

Despite numerous studies reporting on the importance of and barriers to cervical cancer screening among Hispanics/Latinas in the US, less is known about the development and effectiveness of interventions designed to increase cervical cancer screening among this population. We reviewed cervical cancer screening interventions designed for Hispanics/Latinas in the US using an established qualitative systematic review approach [43, 44]. This systematic approach allowed us to identify characteristics of effective interventions and gaps in the existing cervical cancer prevention science.

MATERIALS AND METHODS

This qualitative systematic review included a search of the literature using online electronic databases [43]. The review was overseen by a team of researchers with extensive experience in health behavior intervention development, implementation, and evaluation and in sexual and reproductive health within the rapidly growing immigrant Hispanic/Latino community in the southeastern US [38, 44–50]. Six databases were used: PubMed, CINAHL, EBSCO Academic Search Premier, ProQuest, JSTOR, and PsycInfo. Databases were searched from their inception through June 30, 2013. Each database was searched using the following Boolean terms and keywords: (Hispanic OR Latino OR Latina) AND (women OR woman OR female) AND (“cervical cancer” OR HPV OR “human papilloma virus” OR “human papillomavirus”) AND (intervention OR program). In addition, citations from the bibliographies of identified papers were analyzed and relevant citations were selected for review. English-language peer-reviewed journals were used.

In order to be included in the review, papers had to document an intervention designed to improve screening for cervical cancer among Hispanic/Latina women ages 18 years and older living in the US. Interventions were included if they were designed for and implemented with Hispanics/Latinas exclusively or if they were designed for Hispanics/Latinas along with other groups and at least 50% of the identified participants were

Hispanic/Latina. Papers that did not report sufficient information to be abstractable were excluded. Although some interventions were described in multiple papers, relevant information abstracted from each paper was combined to review each intervention only once.

Data Collection and Abstraction

An abstraction form was used to document each intervention's name, a description of the intervention (e.g., theories used and components) and participants, the intervention setting, the evaluation study design, and screening outcomes.

RESULTS

A total of 795 abstracts were identified. After initial screening of all abstracts, 66 papers were identified for closer review. Cross-referencing these papers yielded 18 additional references. In total, 45 articles met the inclusion criteria (including multiple papers for the same intervention) for a total of 32 unique interventions. The interventions and their key characteristics are summarized in Table 1.

About two thirds of the interventions (n=23) targeted Hispanics/Latinas exclusively [11, 51–84]; the remainder targeted a broader sample of multiethnic women [85–94]. Eight interventions were based exclusively or partly in Texas [11, 51–54, 56, 67, 68, 70, 83, 91, 92], seven in California [11, 54, 63–65, 85, 87, 88, 93], six in Arizona [59–61, 73, 74, 77, 78, 84, 94], four in New York [57, 58, 80, 81, 83, 89, 90, 93], and two in Washington state [70–72]. Additional intervention sites included Colorado [86], New Mexico [11, 54], Arkansas [57, 58, 80, 81], Illinois [55], Virginia [69], Pennsylvania [66], Florida [62], Georgia [75, 76], and Alabama [79]. The interventions included one-time intervention sessions or activities [57, 58, 62, 68, 72, 77, 78, 80–82, 88, 90, 94]; multiple-session or multiple-contact programs [11, 54, 59–61, 63–66, 73–76, 79, 84]; and programs with ongoing activities over a specified period of time, such as media campaigns, system protocol changes, or materials distribution [51–53, 55, 56, 67, 69, 72, 83, 85–87, 89, 91–93]. Breast cancer screening was jointly targeted along with cervical cancer screening in more than half (n=18) of the interventions [11, 51–56, 58–65, 69, 73, 74, 77, 78, 82–84, 89, 91, 92].

Thirteen of the interventions described one or more specific behavioral theories that informed the intervention; social cognitive or social learning theory (n=9) was the most commonly used [51–53, 57, 58, 63, 70–72, 75–78, 80, 81, 83, 91, 92]. Other theories included the health belief model (n=4) [51–53, 66, 70, 71, 79], the theory of reasoned action (n=2) [51–53, 70, 71], the transtheoretical stages of change model (n=1) [70, 71], diffusion of innovations (n=1) [51–53], social influence theory (n=1) [88], popular education (n=1) [75, 76], and adult education theory (n=1) [68]. In addition, eight studies described using conceptual frameworks and intervention development strategies either in conjunction with or independently of specific theoretical foundations [11, 54, 57, 58, 66, 70, 71, 73, 74, 79–82, 94], and six were based on existing interventions [55, 57, 58, 72–74, 77, 78, 80, 81, 83]. The frameworks described included community-based participatory research (CBPR) or community-based participatory action (n=7) [11, 54, 57, 58, 66, 70, 71, 73, 74, 80–82, 94],

intervention mapping (n=3) [11, 54, 70, 71, 79], the PEN-3 Model (n=3) [57, 58, 79–82], and empowerment (n=1) [82].

Intervention Strategies

A number of intervention strategies were used across the different interventions, with many employing multiple strategies. The use of community members as lay health advisors (LHAs) was the most commonly used strategy, although the number and role of LHAs varied greatly across studies. Of the 32 interventions, 24 included the participation of at least one LHA (e.g., community outreach worker or *promotora*), either as the sole intervention strategy [11, 54, 56–59, 62–66, 70, 71, 73–81, 94] or in combination with other strategies [51–53, 55, 60, 61, 67, 72, 82–84, 88, 91, 92]. The LHAs were cancer survivors [56–58, 80–82], members of churches [55, 60, 61, 88], and/or volunteer or paid community members who generally represented the target population [11, 51–54, 57–59, 62–67, 70–84, 91, 92, 94]. Responsibilities of LHAs across the different interventions included: recruiting eligible women [55, 60, 61, 63, 73, 74, 79, 82, 88, 94]; coordinating support services (e.g. childcare and transportation) [73, 74, 82, 88]; serving as community role models by participating in mass media campaign messages [51, 52, 67, 83, 91, 92]; distributing intervention materials such as community bulletins, flyers, educational pamphlets, and information about local providers and screening resources [51–53, 55, 57, 58, 67, 70–74, 79–83, 91, 92, 94]; delivering one-on-one [11, 54, 70–74, 79, 94] and small group [57–66, 73, 74, 77–81, 94] educational sessions; providing general outreach and reminding women about screening appointments [56, 72–76, 79, 84]; and navigating and facilitating screening services for women [57, 58, 60, 61, 73, 74, 77, 78, 80–82].

Clinic-based strategies were the second most common type of intervention, used in nine of the interventions [55, 69, 72, 82, 84–87, 89, 93]. Such strategies included the organization of free (limited-time or ongoing) screening services [55, 69, 82, 84, 87]; modifications to screening and/or clinic policies and protocols (e.g. providing single-visit screening/excision services, routinely offering cervical cancer screening to women needing a pelvic exam, expanding clinic hours, and realigning office responsibilities) [72, 85–87, 95]; and clinic-based outreach and/or educational programs (e.g. delivery of invitation/reminder postcards, phone calls, vouchers for follow-up care, and presentation of educational videos to patients) [84, 89, 93, 95]. In several of the interventions (n=3), LHAs helped to implement clinic-based strategies by promoting and orienting community members to clinic services [55, 82, 84].

In addition, five interventions involved partnerships with churches and/or were church-based [55, 60, 61, 69, 82, 88]. These interventions predominantly consisted of educational interventions delivered by LHAs [60, 61, 82, 88]. One such intervention also included free screening conducted at the church [88] and another offered participants free and reduced cost screenings at local providers [82]. Partnerships with Hispanic/Latino-serving churches also were used to recruit for community screening programs [55, 69].

Other intervention strategies included mass media campaigns (often in combination with community outreach through volunteers or LHAs) [51–53, 67, 83, 91, 92], in-service

training programs for home-health attendants [90], and the development and implementation of an educational and cervical cancer game [68].

Intervention Evaluation

All of the interventions reported some type of evaluation activities, and 30 interventions reported outcome evaluation methods. Study designs included tracking of screenings (n=4) [56, 69, 82, 88], qualitative post-tests (n=1) [68], single group pre- and post-tests (n=5) [55, 59, 62, 64, 65, 87], pre- and post-tests with random samples of participants (n=1) [91, 92], and quasi-experimental (n=6) [11, 51–54, 67, 83, 85, 93] and experimental (n=12) [57, 58, 60, 61, 63, 66, 70–74, 77–81, 84, 86, 89] designs. Follow-up periods ranged from six weeks [62] to three years post-intervention [51–53, 83], with the most common follow-up period being six months (n=6) [11, 54, 62, 64–66, 70, 71, 86]. Screening was assessed using self-report [11, 51–54, 57–67, 70, 71, 73, 74, 77, 78, 80, 81, 83, 84, 91–93] or clinic-based tracking and medical record review [56, 69, 82, 85, 86, 88, 89]. Other evaluation activities included measuring participant satisfaction (n=3) [68, 90, 94] and process evaluation (n=4) [68, 75, 76, 90, 94].

Outcomes described included number of cervical cancer screenings provided or proportion of sample receiving screening [56, 59, 62, 69, 82, 88], knowledge of cancer prevention and screening tests [11, 54, 55, 57, 58, 60–62, 64–66, 68, 70, 71, 75, 76, 80, 81, 87, 90–92], perceived acceptability of cervical cancer screening [87], patient-provided quality ratings of medical care [87], levels of social support [73, 74], and self-efficacy to receive and promote cervical cancer screening [75, 76]. 17 studies tested for changes in cervical cancer screening rates; of those studies, significant increases in screening rates were reported in 12 interventions [11, 51–54, 57, 58, 64–67, 70, 71, 77, 78, 80, 81, 85, 86, 89, 93]. The majority of studies reporting significant results for changes in cervical cancer screening employed experimental [57, 58, 63, 66, 70, 71, 77, 78, 80, 81, 86, 89] or quasi-experimental [11, 51–54, 67, 85, 93] research designs with comparison groups and multiple assessment points. Only one of the five studies involving a single-group design demonstrated significant results related to cervical cancer screening [64, 65].

DISCUSSION

Through this review, we were able to identify characteristics of effective interventions to increase cervical cancer screening among Hispanics/Latinas in the US, as well as gaps in the existing cervical cancer prevention science that should be addressed.

Key components of effective interventions identified

The use of theory—Of the 12 interventions that resulted in significant increases in cervical cancer screening, five described the use of behavioral theory [51–53, 57, 58, 66, 70, 71, 77, 78, 80, 81]. Such results provide support for the use of theory and call for more description of interventions' theoretical foundations and how interventions apply theory to understand and address specific individual-level, social, and cultural barriers to cervical cancer screening. As theory-based interventions typically achieve a higher level of success than those without a theoretical foundation [97], the findings of this review suggest that even

greater use of theory would be beneficial for increasing cervical cancer screening among Hispanics/Latinas in future interventions. Furthermore, theory-based interventions help to explain and understand the processes that lead to positive outcomes and increase the likelihood that efficacious interventions can be adapted for other populations [97].

The use of CBPR—Four of the 12 successful interventions used CBPR as part of their intervention development strategy [11, 54, 57, 58, 66, 70, 71, 80, 81]. Traditional “outside-experts” (e.g., researchers) may have limited appreciation of how contexts and individuals interact. Thus, understanding and intervening on the complex behavioral, situational, and environmental factors that influence screening may benefit from the multiple perspectives, experiences, and expertise of community members, organization representatives, business leaders, and academic researchers. Blending the lived experiences of community members, the experiences of organization representatives based in service provision, and sound science has the potential to develop deeper and more informed understandings of cancer screening disparities and produce more relevant and more likely successful and impactful interventions designed to promote community health and reduce health disparities. CBPR is a collaborative research approach designed to ensure and establish structures for co-learning, reciprocal transfer of expertise, sharing of decision-making power, and mutual ownership of the processes and products of research. CBPR helps to ensure that interventions are more authentic, successful, and tailored in addressing health disparities, particularly among vulnerable communities [45, 98, 99].

The use of LHAs—Several interventions demonstrating significant increases in cervical cancer screening (n=6) consisted of one-on-one or small-group educational sessions delivered either exclusively by LHAs [11, 54, 64–66, 70, 71, 77, 78] or by LHAs in combination with program staff [57, 58, 80, 81]. In other intervention efforts with significant results, LHAs were involved in mass media campaigns (n=2) [51–53, 67]. LHAs are thought to be effective because they are part of the communities in which they work, have an understanding of community strengths and needs, are able to communicate effectively with other community members, and can promote health in culturally congruent ways, using their knowledge of traditional health practices and cultural identity [44].

The majority of the effective LHA interventions involved LHAs interacting with participants at multiple sessions or carrying out ongoing activities in the community (n=5) [11, 51–54, 64–67]. This finding suggests that interventions involving repeated contact with LHAs over a longer period of time may be more successful than one-time events for ensuring that barriers to screenings are addressed and for behavior change to take place.

In some successful interventions, LHAs met with community members one-on-one, and in others they carried out activities with small groups. This finding suggests that both types of interactions are valuable and can be carried out effectively by LHAs. In future interventions, LHAs may be trained to be more flexible to meet the needs of their peers, for example, conducting one-on-one or group activities to reach specific community members and to address individual barriers based on what they determine is needed and meaningful to promote behavior change.

The remaining four interventions that resulted in statistically significant improvements in cervical cancer screening rates were clinic-based, involving system changes or outreach to existing patients [85, 86, 89, 93]. The effectiveness of clinic-based and system-wide strategies may in part reflect implementation among a sub-population of Hispanics/Latinas who had already successfully accessed clinical care, either at the time of the intervention or at some time in the past. As limited access to health services continues to be a leading barrier to cervical cancer screening among this population [5, 30], such interventions may have limited effect on improving cervical cancer screening rates among this group. Nevertheless, the positive effects of these interventions draw attention to the continued need for access-enhancing and multilevel interventions among Hispanics/Latinos in the US. Because LHAs are capable of referring community members to local service providers, they can play an important role in ensuring that clinic-based changes reach a broader population.

Gaps in the literature

Efforts to expand the body of evidence surrounding cervical cancer screening interventions for Hispanics/Latinas exist, but need to be strengthened especially as they relate to targeting a more diverse population (e.g., region and age), broadening outcomes (e.g., accurate interpretation of screening results and engaging in appropriate and future care after screening), and strengthening study design (e.g., longer follow-up period) [100].

There is a need for intervention studies in new receiving communities—The majority of identified interventions were implemented in US regions and states with well-established Hispanic/Latino populations and communities. In light of research that suggests that cervical cancer screening rates are 25–40% lower among foreign-born women (particularly women born in Mexico and Central America) compared to women born in the US [8, 18], research to test the feasibility and effectiveness of interventions to improve cervical cancer screening and prevention in areas with emerging or less-established immigrant Hispanic/Latino communities—where barriers to cervical cancer screening may be exaggerated or unique from those in other communities—is needed. This is particularly true in the Southeast, which has experienced the most rapid growth within the immigrant Hispanic/Latino population in recent years. These immigrant Hispanics/Latinos tend to be more recently arrived, be more likely to be from rural Mexico and Central America, have lower literacy levels, and be less acculturated than those who have settled in traditional immigration destinations, such as Arizona, California, New York, and Texas. Moreover, health systems in this region have limited bilingual and bicultural infrastructure and are just beginning to respond to the health needs of this population [38, 101].

There is a need to broaden outcome measures—Although screening is an important step to prevent cervical cancer, there are other related outcomes that should be measured as well, including whether women receive and accurately interpret their screening results in order to know whether subsequent care (such as further testing and treatment) is needed. Additionally, cervical cancer screening is not a one-time behavior, but one that is repeated on a regular basis. Although increased screening is essential to addressing cervical cancer disparities, it is also important that Hispanics/Latinas know and understand their results in order to know when to have their next cervical cancer screening and to schedule

appropriate follow-up care. Among Hispanics/Latinas who access cervical cancer screening, even fewer receive their results, seek follow-up after an abnormal or inconclusive result, or continue to maintain routine screenings according to guidelines for their age group [102–107]. Some studies have explored clinic-based strategies to increase follow-up among Hispanics/Latinas with abnormal cervical cancer screening results [55, 72, 95, 108, 109], and in the future both clinic-based and community-based educational interventions and LHA interventions should include strategies to ensure that Hispanics/Latinas not only receive routine screenings but also know their results and schedule and receive follow-up care as needed.

There is a need for longer follow-up periods—In light of the on-going need for cervical cancer screening during the life course, there is a need for studies that follow Hispanics/Latinas for longer periods of time. Among the studies reviewed, some follow-up periods were as short as six weeks post-intervention, and the most common follow-up period was six months. This length of follow-up may have been inadequate to fully capture program effects and/or the longer term impact and sustainability of results. Longitudinal studies that follow women over a longer time period will help determine whether they are engaging in appropriate care and following screening guidelines.

There is a need for comprehensive interventions with broad focus on sexual and reproductive health—Another suggestion for improving cervical cancer screening is to create more comprehensive sexual and reproductive health interventions. Research has indicated that some Hispanics/Latinas want and need sexual and reproductive health interventions that are comprehensive and do not focus on one aspect of reproductive health [110]. Interventions should focus not only on specific behavior related to sexual and reproductive health, but also offer guidance on a variety of related topics, including sexual and reproductive health resources, what to expect during sexual and reproductive health screening visits, anatomy and fundamental reproductive health information, disease transmission and prevention, and condom use and negotiation skills. The effective interventions identified in this review exhibit a trend towards comprehensive interventions with multiple foci; for example, half of the effective interventions targeted breast cancer screening as well as cervical cancer screening [11, 51, 53, 54, 57, 58, 64, 65, 67, 77, 78, 80, 81, 89]. Future interventions should continue to further build on this approach.

There is a need for increased understanding of LHA roles and responsibilities—Among the effective interventions, most of the LHA roles were limited to education. LHAs can engage in more than education only and instead assist individuals with needs that are difficult for professionals to address, serve as opinion leaders to change norms that negatively impact health and help-seeking, and advocate for community change [46, 111]. Future research should build capacity of community members (e.g., LHAs) to take on a variety of roles and responsibilities to reduce cervical cancer screening disparities.

Limitations

There were several limitations to this review. The literature search was subject to publication bias and may not have captured all interventions designed to improve cervical

cancer screening among Hispanics/Latinas in the US. For example, the review did not include potentially effective interventions that have not been published or unpublished studies with null findings that could provide important information about what does and does not work to promote cervical cancer screening among Hispanic/Latina communities. In addition, white papers and publications in Spanish and other languages were not included but could be supplemental sources of data about characteristics of effective interventions and research gaps. Furthermore, because reporting of intervention components, development approaches, evaluation methods, and other characteristics is not standardized across all studies and publications, information of varying levels of detail was abstracted about the different interventions included in the review, which may have affected results.

CONCLUSIONS

Findings from this review point to a need for expanded and more rigorous evaluation of interventions to improve cervical cancer screening among Hispanic/Latina women in the US. Given the studies reviewed, interventions involving LHAs and using behavioral theory and CBPR approaches appear to have the most promise for promoting cervical cancer screening among Hispanic/Latina women. However, there continues to be a need for the development, implementation, and evaluation of interventions in geographic areas with new and emerging Hispanic/Latino populations (e.g., the southeastern US) and that are comprehensive and promote screening within the larger and more relevant context of sexual and reproductive health; follow participants for longer periods of time for evaluation; assess whether Hispanics/Latinas obtain and understand their cervical cancer screening results; and broaden the roles of LHAs in order to build capacity and reduce health disparities within a vulnerable and neglected population.

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TABLE 1
Review of cervical cancer screening interventions among Hispanic/Latina women in the United States

Study	Location	Description of Participants	Theoretical Foundation	Intervention Development Strategy	Intervention Components	Outcome Evaluation Design	Cervical Cancer Screening Outcomes	Joint Targeting of Breast Cancer Screening
Bastani et al. (2002) [85]	CA	Multiethnic female health department patients; 18 years old (N=18,642; 57.5% Hispanic)	N.D.	N.D.	System changes to hospital and clinic protocols, physician and patient education, and expanded capacity	Quasi-experimental non-equivalent control group design over 2.5 years	↑ screening (p<0.05) in some clinical settings	No
Batal et al. (2000) [86]	CO	Female urgent care patients; 18–70 years old (N=197; 52% Hispanic)	N.D.	N.D.	System changes to routinely offer screening to clinic patients needing a pelvic exam	Experimental 2-group randomized trial with pre-test and 6-month follow-up	↑ screening (p<0.01)	No
Burger et al. (1995) [87]	CA	Uninsured women; > 18 years old (N=126; 83% Hispanic)	N.D.	N.D.	Educational pamphlet and free screening and excision services offered to clinic patients	Single group with pre-test and immediate post-test	N.D.	No
Byrd et al. (2012) [70]; Byrd et al. (2013) [71]	TX; WA	Women of Mexican-origin (N=613)	HBM; TRA; TTM; SCT	CBPR; IM	LHAs led one-on-one educational sessions that included a video only, a flip chart only, or a video and flip chart	Experimental 4-group randomized trial evaluating intervention and specific intervention materials with pre-test and 6-month follow-up	↑ screening in intervention groups (p<0.0001) results in 2 out of 3 sites	No
Davis et al. (1994) [88]	CA	Female parishioners; 21 years old (educational sessions: N=943; 35% Hispanic; screening sessions: N=490; 76% Hispanic)	SIT	N.D.	LHAs from participating churches led one-time educational sessions and free screening was conducted at church	Baseline assessment of screening history with tracking of follow-up screening rates	98% of Hispanic women identified for screening and an additional 94 Hispanic women presented for screening	No
Dietrich et al. (2006) [89]	NY	Low-income and minority female health center patients; 50–69 years old (N=1413; 63%)	N.D.	N.D.	Clinic staff conducted outreach using repeated phone calls over an 18-month period	Experimental 2-group randomized trial with pre-test and 3-month follow-up	↑ screening (p<0.001)	Yes

Study	Location	Description of Participants	Theoretical Foundation	Intervention Development Strategy	Intervention Components	Outcome Evaluation Design	Cervical Cancer Screening Outcomes	Joint Targeting of Breast Cancer Screening
		Spanish primary language)						
Duggan et al. (2012) [72]	WA	Hispanic female health center patients; 21–64 years old (N=600)	SCT	Intervention video from Byrd et al. (2012) [70]; Byrd et al. (2013) [71]	LHAs led one-time one-on-one educational sessions using a video and helped participants schedule screening or participants were shown a video only	Experimental parallel randomized trial evaluating LHA intervention and video only	<i>Outcome data not available</i>	No
Fernández et al. (2005) [54]; Fernández et al. (2009) [11]	CA; TX; NM	Hispanic farmworker women; 50 years old (N=497)	N.D.	CBPR; IM	LHAs led one-time one-on-one educational sessions and made follow-up phone calls with participants	Quasi-experimental with intervention and comparison communities and with pre-test and 6-month follow-up	↑ screening (p<0.05)	Yes
Fernández-Esquer et al. (2003) [51]; Ramirez et al. (1995) [52]; McAlister et al. (1995) [53]	TX	Mexican American women; 18 years old (N=1804)	SLT; DOI; HBM; TRA	N.D.	LHAs served as role models in mass media campaign messages and distributed intervention materials	Quasi-experimental with intervention and comparison communities and with pre-test, 24-month follow-up, and 36-month follow-up	↑ screening among women <40 years old who had previously not adhered to screening recommendations (p<0.05)	Yes
Frank-Stromborg et al. (1998) [55]	IL	Rural Latina women (N=81)	N.D.	Intervention model from Navarro et al. (1998) [63]	LHAs promoted 5-day program that included educational sessions, free transportation, screening, translation, and childcare	Single group with pre-test and immediate post-test	N.D.	Yes
Hansen et al. (2005) [56]	TX	Hispanic women; >18 years old (N=141)	N.D.	N.D.	Cancer survivor LHAs promoted screening within social networks	Tracking screenings over 13 months	43 out of 141 women contacted by the LHAs received screening	Yes
Hunter et al. (2004) [84]	AZ	Uninsured Hispanic women 40 years old (N=101)	N.D.	N.D.	LHAs conducted home visits to follow-up with patients who had received screening postcard reminding them to schedule their	Experimental 2 group randomized trial	Trend toward higher rate of screening in intervention group than in comparison	Yes

Study	Location	Description of Participants	Theoretical Foundation	Intervention Development Strategy	Intervention Components	Outcome Evaluation Design	Cervical Cancer Screening Outcomes	Joint Targeting of Breast Cancer Screening
					next annual screening or patients received reminder postcard only		group (N.S.)	
Larkey (2006) [59]	AZ	Latina women; 18 years old (N=457)	N.D.	N.D.	LHAs led 6 bimonthly church- and home-based small-group educational sessions	Single group with pre-test and immediate post-test	39% of participants who had previously not adhered to screening recommendations had received screening by post-test	Yes
Larkey et al. (2009) [73]; Larkey et al. (2012) [74]	AZ	Latina women due for cancer screening; 18 years old (N=1006 randomized; N=509 evaluable)	N.D.	CBPR; intervention model from Larkey (2006) [59]	LHAs led 7 weekly social support group or one-on-one educational sessions	Experimental 2-group cluster-randomized trial comparing social support group and one-on-one interventions with pre-test, 3-month follow-up, and 15-month follow-up	Trend toward higher screening rates in one-on-one intervention (N.S.)	Yes
Lopez & Castro (2006); [60] Castro et al. (1995) [61]	AZ	Hispanic female church members; 18 years old (N=447)	N.D.	N.D.	LHAs led church-based small group educational sessions and helped facilitate screening	Experimental 2-group randomized trial with pre-test and 12-month follow-up	N.S.	Yes
Luque et al. (2011) [75]; Watson-Johnson et al. (2012) [76]	GA	Hispanic farmworker women (N=7 LHAs)	Popular Education; SCT	N.D.	LHAs were trained using 2-session curriculum	N.D.	N.D.	No
Meade et al. (2002) [62]	FL	Hispanic farmworker women; 18 years old (N=65)	N.D.	N.D.	LHAs led one-time small-group educational sessions and helped schedule screenings	Single group with pre-test, immediate post-test and 6-week follow-up	50% of participants eligible for screening had received screening by 6-week follow-up	Yes

Study	Location	Description of Participants	Theoretical Foundation	Intervention Development Strategy	Intervention Components	Outcome Evaluation Design	Cervical Cancer Screening Outcomes	Joint Targeting of Breast Cancer Screening
Moore-Monroy et al. (2013) [94]	AZ	Predominantly Latina women; 18 years old (Study 1: N=174; Study 2: N=837, 96.8% Hispanic or Latina)	N.D.	CBPA	LHAs led one-time one-on-one and small-group educational sessions	N.D.	N.D.	No
Morgan & Levin (1995) [90]	NY	Female home health care attendants (N=1411; 61.8% Hispanic)	N.D.	N.D.	One-time in-service training program	N.D.	N.D.	No
Navarro et al. (1998) [63]	CA	Latina women (N=512)	SLT	N.D.	LHAs led 12 weekly small-group educational sessions	Experimental 2-group cluster-randomized trial with pre-test, immediate post-test, 12-month follow-up, and 24-month follow-up	Trend toward higher rate of screening in intervention group than in comparison group (N.S.)	Yes
Navarro et al. (2007) [64]; Navarro et al. (2007) [65]	CA	Latina women (N=311 primary participants and N=269 "learning partners")	N.D.	N.D.	LHAs led 12 weekly and 2 monthly small-group educational sessions and participants shared information with up to 2 additional "learning partners"	Single group with pre-test and 6-month follow-up	↑ screening among primary participants (p<0.01) and "learning partners" (p<0.05) (statistically significant)	Yes
Nuño et al. (2011) [77]; Nuño et al. (2011) [78]	AZ	Hispanic women; 50 years old (N=381)	SCT	Intervention model from Lopez & Castro (2006) [60] and Castro et al. (1995) [61]	LHAs led one-time small-group educational sessions with optional booster course after 1 year	Experimental 2-group randomized trial	↑ screening within past two years (p=0.007)	Yes
O'Brien et al. (2010) [66]	PA	Hispanic women; 18-65 years old (N=120)	HBM	CBPR	LHAs led 2 small-group educational sessions	Experimental 2-group delayed intervention randomized trial with pre-test and 6-month follow-up	↑ screening (p=0.004)	No
Ramirez et al. (1999) [67]	TX	Hispanic women (N=212)	N.D.	N.D.	LHAs served as role models in mass media campaign messages	Quasi-experimental with intervention and	↑ screening adherence (p<0.018)	No

Study	Location	Description of Participants	Theoretical Foundation	Intervention Development Strategy	Intervention Components	Outcome Evaluation Design	Cervical Cancer Screening Outcomes	Joint Targeting of Breast Cancer Screening
Saad-Harfouche et al. (2011) [58]; Sudarsan et al. (2011) [80]; Jandorf et al. (2012) [81]; Jandorf et al. (2008) [57]	AR; NY	Latina women (87%) and men (13%); >18 years old; predominantly Spanish-speaking (N=1,233); primary analysis only included data from women	SCT	CBPR; PEN-3 Model; adaptation of intervention promoting BC screening among African-American women [112]	and distributed intervention materials LHAs, including cancer survivors, led one-time small-group educational session and helped navigate screening	comparison communities with as pre-test and 24-month follow-up Experimental 2-group cluster-randomized trial with pre-test, immediate post-test, 2-month follow-up, and 8-month follow-up	↑ screening (p=0.08) at 2-month follow-up within smaller sub-study of women	Yes
Scarinci et al. (2012) [79]	AL	Latina immigrant women (N=543)	HBM	PEN-3, IM	LHAs led 6 small-group and 2 one-on-one educational sessions	Experimental 2-group cluster-randomized trial with pre-test, immediate post-test, 12-month follow-up, and 24-month follow-up	<i>Outcome data not available</i>	No
Sheridan-Leos (1995) [68]	TX	Hispanic women (N=100)	Adult Education Theory	N.D.	Interactive game played in small groups with an instructor	Qualitative post-test with sample of participants	N.D.	No
Suarez et al. (1993) [92]; Suarez et al. (1993) [91]	TX	Mexican-American and black women; 40–70 years old (N=189; 56.6% Mexican American)	SLT	N.D.	LHAs served as role models in campaign messages and distributed intervention materials	Pre-test and post-test at beginning and end of 2.5-year intervention period with random sample of participants	N.S.	Yes
Suarez et al. (1997) [83]	TX	Mexican-American women; 40 years old (2 independent samples of 923 each for pre-test and post-test)	SCT	Intervention model from Fernández-Esquer et al. (2003) [51], Ramirez et al. (1995) [52], and McAlister et	LHAs served as role models in campaign messages and distributed intervention materials	Quasi-experimental with intervention and comparison communities with pre-test and 3-year follow-up	N.S.	Yes

Study	Location	Description of Participants	Theoretical Foundation	Intervention Development Strategy	Intervention Components	Outcome Evaluation Design	Cervical Cancer Screening Outcomes	Joint Targeting of Breast Cancer Screening
Warren et al. (2006) [69]	VA	Latina women; 40 years old (N=928)	N.D.	al. (1995) [53] N.D.	One-time small-group education sessions and free screening services and educational programs offered one day per month	Tracking number of screenings provided over 6-month intervention period	928 screening visits completed (439 first-time participants)	Yes
White et al. (2012) [82]	AL	Foreign-born Latina immigrant women (N=782)	N.D.	CBPR; Empowerment Model; PEN-3 Model	LHAs organized one-time luncheons in churches facilitated by physicians and cancer survivors; participants were able to schedule low-cost and free screening appointments and follow-up care	Tracking of screenings	80% of participants scheduled a screening appointment; 65% of those who scheduled appointments attended the visit	Yes
Yancey et al. (1995) [93]	CA; NY	Predominantly African American and Latina female community health center patients (N=1744; 65.1% Latina)	N.D.	N.D.	Educational videos in clinic waiting rooms	Quasi-experimental 1-week-on-1-week-off design	↑ screening (p<0.05)	N.D.

Note. CBPA, community-based participatory action; CBPR, community-based participatory research; DOI, diffusion of innovations; HBM, health belief model; IM, intervention mapping; LHA, lay health advisor; N.D., not described; N.S., not significant; SCT, social cognitive theory; SIT, social influence theory; TRA, theory of reasoned action; TTM, transtheoretical model