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Development of a Theory-Based (PEN-3 and Health Belief Model), Culturally Relevant Intervention on Cervical Cancer Prevention Among Latina Immigrants Using Intervention Mapping

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Abstract

The development of efficacious theory-based, culturally relevant interventions to promote cervical cancer prevention among underserved populations is crucial to the elimination of cancer disparities. The purpose of this article is to describe the development of a theory-based, culturally relevant intervention focusing on primary (sexual risk reduction) and secondary (Pap smear) prevention of cervical cancer among Latina immigrants using intervention mapping (IM). The PEN-3 and Health Belief Model provided theoretical guidance for the intervention development and implementation. IM provides a logical five-step framework in intervention development: delineating proximal program objectives, selecting theory-based intervention methods and strategies, developing a program plan, planning for adoption in implementation, and creating evaluation plans and instruments. We first conducted an extensive literature review and qualitatively examined the socio-cultural factors associated with primary and secondary prevention of cervical cancer. We then proceeded to quantitatively validate the qualitative findings, which led to development matrices linking the theoretical constructs with intervention objectives and strategies as well as evaluation. IM was a helpful tool in the development of a theory-based, culturally relevant intervention addressing primary and secondary prevention among Latina immigrants.

Keywords

intervention development; intervention mapping; cervical cancer prevention; Latina immigrants

The cervix is the fourth leading site of new cancer cases among Latinas in the United States, with an incidence rate of 13.2/100,000 as compared to 8.2/100,000 among White women (American Cancer Society, 2009), and the mortality rate is 40% higher among Latinas as compared to Whites (American Cancer Society, 2009). Given the increased Latino immigration to this country, cervical cancer incidence and mortality rates in Latin America need to be seriously considered as they have direct implications for cervical cancer control in the United States. The incidence of cervical cancer in Central and South America are 40.3/100,000 and 30.9/100,000, respectively (Pan American Health Organization, 2001), with cervical cancer being the leading cause of cancer mortality among women in Latin America (Pisani, Parkin, Bray, & Ferlay, 1999).

In terms of primary prevention, human papillomavirus (HPV) infection has been shown to be the most important contributing factor for cervical cancer (Rock, Michael, Reynolds, & Ruffin, 2000). Latinas are 2 times more likely than African American women and 5 times more likely than White women to display an association between HPV infection and squamous intraepithelial lesions (Tortolero-Luna et al., 1998). With regard to secondary prevention, Latinas are less likely to get a Pap smear than Whites (Hubbell, Chavez, Mishra, & Valdez, 1996) and African American women (Bazargan, Bazargan, Farooq, & Baker, 2004), with screening rates being even lower among Latina immigrants (Hubbell et al., 1996; Scarinci, Beech, Kovach, & Bailey, 2003).

Several studies have found that there are a number of factors associated with cervical cancer screening among Latinas, such as income (Swan, Breen, Coates, Rimer, & Lee, 2003), education (Chavez, Hubbell, McMullin, Martinez, & Mishra, 1995; Scarinci et al., 2003), health insurance (Chavez et al., 1995), having a regular source of health care (Zambrana, Breen, Fox, Gutierrez-Mohamed, 1999), prior history of cancer screening (Zambrana et al., 1999), embarrassment (Byrd, Chavez, & Wilson, 2007), fear of results (Byrd et al., 2007), and self-efficacy (Fernández et al., 2009a). Studies have also shown that Latinas tend to be less knowledgeable (Scarinci et al., 2003) about cancer signs, causes, and treatment effectiveness and tend to display more fatalistic beliefs regarding cancer and cancer screening than White women (Chavez, Hubbell, Mishra, & Valdez, 1997; Scarinci et al., 2003).

One successful approach to improving health behaviors and cervical cancer screening among Latinas has been the development of interventions based on a sociologic approach that takes into account their cultural beliefs, attitudes, and behaviors (Fernández et al., 2009b; Navarro et al., 1998; Navarro et al., 2000; Valdez, Banerjee, Ackerson, & Fernandez, 2002; Yancey, Tanjasiri, Klein, & Tunder, 1995; Zapka et al., 1993), as well as the involvement of lay health educators (Fernández et al., 2009b; Navarro et al., 1998; Navarro et al., 2000). Cognitive behavioral approaches have also shown encouraging results among Latinas (particularly sexual risk reduction; Koniak-Griffin et al., 2003). The purpose of this study is to describe the development of a theory-based, culturally relevant intervention focusing on primary (sexual risk reduction) and secondary (Pap smear) prevention of cervical cancer by combining these two approaches using intervention mapping (IM; Bartholomew, Parcel, Kok, & Gottlieb, 2001). Both the PEN-3 (sociological approach) and HBM (behavioral approach) guided the development and implementation of the intervention (Airhihenbuwa, 1992; Rosenstock, 1990).

BACKGROUND AND LITERATURE REVIEW

Although numerous studies have been conducted on HIV/STI prevention, there has been a lack of interventions focusing on the primary prevention of cervical cancer, that is, sexual risk reduction and HPV. Given the similarity of sexual preventive behaviors between HPV and other STIs, we believe that the findings from HIV/STI intervention trials can be extrapolated to HPV prevention (U.S. Department of Health and Human Services, 2001). Most effective programs addressing HIV/STI prevention have three components in common: information, skills training (problem solving, communication/negotiation, assertiveness, and self-efficacy), and promotion of personal responsibility for sexual decision making (Centers for Disease Control and Prevention, 1999). A review from Shepherd, Peersman, Weston, and Napuli (2000) also reported on the effectiveness of health education interventions to promote sexual risk reduction among low-income women. They found that educational programs that combined providing information with sexual negotiation skills were the most effective strategies (Shepherd et al., 2000). However, both

reviews indicated that most of the studies did not have a Latino representation or that its representation was less than 30%.

Yabroff, Mangan, and Mandelblatt (2003) conducted a comprehensive review on interventions to increase Pap smears, and they found that there was a great variability in their effectiveness. Although only two interventions specifically targeted Latinas, this review provided important insights on the factors that have been associated with effective interventions. Overall, sociologic and a combination of sociologic/cognitive strategies had similar results in Pap smear increases ranging from 2.7% to 9.2%. The most effective approach in delivering a culturally specific intervention to Vietnamese Americans (18% increase in Pap smear rates) was the integration of sociologic, behavioral, and cognitive strategies by using lay health workers, educational brochures, and financial incentives (Dickey & Petitti, 1992). Although cognitive-behavioral strategies that focus on patients have shown promising results in promoting cervical cancer screening (Yabroff et al., 2003), none of these have been tested with Latinas.

Navarro et al. (1998, 2000) developed a successful sociologic community-based intervention to promote breast and cervical cancer screening among low-income Latinas using community health advisors. To our knowledge, this is the only breast and cervical cancer screening intervention among Latinas that is theory-based, developed specifically for this population, and has had its efficacy assessed through a randomized trial. However, this program had limitations: (a) Although a large percentage of participants were Latina immigrants, the focus of the program was on low-income Latinas and not Latina immigrants. As documented above, screening rates are much lower among Latina immigrants as compared to U.S.-born Latinas, as they may face different challenges regarding health care access and health information. (b) Moreover, there was a relatively low impact on behavior change in breast and cervical screening, particularly among women who never engaged in these behaviors. Thus, after a review of the literature relevant to both the primary and secondary prevention of cervical cancer screening, our plans for the proposed intervention were to combine aspects of the program developed by Navarro et al. that has been shown to be effective (cultural relevance, theory-based, and involvement of lay health educators) and cognitive-behavioral strategies that have been shown to be effective in other populations.

METHOD

Intervention Mapping (IM)

Intervention development is a process that begins with examining existing interventions, determining challenges and barriers in the unique setting or population, conducting careful process and formative evaluations, revising the intervention materials, and ending with dissemination. IM is one such systematic process that can be used in program development (Bartholomew et al., 2001). Bartholomew and colleagues (2001) proposed five steps that should be taken when developing an intervention: (a) delineating proximal program objectives—this step specifies “who and what will change as a result of the intervention” by determining the proximal objectives and outcomes and by defining the target audience, including inclusion and exclusion criteria; (b) selecting theory-based intervention methods and strategies—once the objectives, outcomes, and target audience are identified, the research team begins to brainstorm methods and how they can be organized to be consistent with the theoretical framework as well as the proposed objectives and outcomes; (c) developing a program plan—this phase consists of operationalizing the strategies established under Step 2 to concretize implementation plans; (d) planning for adoption in implementation—this step consists of actual implementation of the intervention and all the necessary components, taking into account the context in which the intervention will be

implemented; and (4) creating evaluation plans and instruments—this step will determine whether decisions made throughout the process were correct and how intervention efficacy will be determined in terms of process and outcomes evaluation (Bartholomew et al., 2001). These steps should take place after a comprehensive needs assessment is conducted.

All phases of intervention development were reviewed and approved by the university's institutional review board. All participants went through the informed consent procedures and signed consent forms.

RESULTS: INTERVENTION DEVELOPMENT

Needs Assessments

We first explored the sociocultural factors associated with cervical cancer and screening among Latina immigrants using focus groups (Garcés, Scarinci, & Harrison, 2006; Scarinci et al., 2003) as well as the sociocultural factors associated with sexual risk reduction through qualitative interviews with Latino and Latina immigrants. Based on the qualitative findings, we developed a quantitative questionnaire that addresses the primary and secondary prevention of cervical cancer that was administered and validated among 202 Latina immigrants (unpublished data). The relevant findings from the qualitative and quantitative studies are described in Table 1.

Identification of Outcomes and Proximal Objectives

Based on the results of the qualitative and quantitative needs assessments, we conducted two focus groups with Latina immigrants ($n = 13$) in which we presented the findings and asked for their input regarding intervention development. The findings were presented according to the data presented in Table 1 but in a manner that could be easily understood by participants (including examples). We then engaged in a discussion with participants about whether they agreed or disagreed with these findings. We addressed topics such as intervention format, recruitment and retention, information delivery format, target audience (women, men, or both), who should deliver the intervention, etc.

Some suggestions from the focus groups were that (a) primary and secondary prevention should be addressed together as part of the same program under the umbrella of “health promotion among women,” (b) the topic should be addressed in small groups of women so that they would be comfortable asking questions and discussing sensitive issues, and (c) the intervention should focus on women only. One of the groups also suggested “friendship circles” in which one woman hosts the sessions in her home and invites her friends to attend. Through this format, they could motivate each other to overcome the barriers to primary and secondary prevention of cervical cancer (social networks).

To document efficacy of the intervention, we chose two measurable primary outcomes (i.e., cervical cancer screening as recommended by U.S. Preventive Services Task Force and increased partner communication regarding sexual behavior) and one secondary outcome (i.e., changes in knowledge, attitudes, and beliefs regarding the relationship between HPV infection and cervical cancer).

Selecting Theory-Based Intervention Methods and Strategies

Once the outcomes were identified, we proceeded with the research design. The choice of group randomized trial versus randomization at the individual level was based on the fact that word of mouth is very powerful among the target audience. As such, the chosen unit of randomization was apartment complexes and trailer parks. Through this approach, we could

minimize some threats to internal validity (e.g., resentful demoralization, contamination) by including in the same groups participants who are likely to talk to each other.

Throughout our needs assessments, we found that Latina immigrants were also very interested in nutrition and diabetes prevention. To avoid a number of potential threats to internal validity (e.g., resentful demoralization among staff running a “control” group as compared to the “intervention” group) and address a need in the community, we proposed two “interventions” (cervical cancer vs. nutrition and diabetes prevention). It was also clear from the findings in the needs assessment phase that cognitive-behavioral strategies should be a cornerstone of the proposed intervention given all the identified intrapersonal barriers (e.g., fear of results, embarrassment). The crucial component of this phase was to identify intervention strategies that have been shown to be effective in the literature and to integrate them with the proposed theoretical constructs and the results of the needs assessments. Table 2 details the matrices that link the theoretical constructs with intervention objectives and strategies.

Also of relevance are the use of theoretical models that guided the proposed intervention and how we made it “culturally relevant” by using the PEN-3 and the HBM (see Figure 1; Airhihenbuwa, 1992; Rosenstock, 1990). Under the PEN-3, perceptions include the knowledge, attitudes, and beliefs that may contribute or hinder engagement in a particular health behavior. Enablers are community or structural factors such as the availability of resources, accessibility, referrals, etc. Nurturers refer to reinforcing factors that the target audience receive from their social networks. The third and most important and unique dimension of the model is the cultural appropriateness of a health behavior, in which the perceptions, enablers, and nurturers are classified as positive (factors that lead the target audience to engage in a particular health behavior), exotic (practices that have no harmful health consequences and should not be changed but incorporated in the intervention), and negative (factors that lead the target audience to not engage in the health behavior or to engage in a harmful behavior) (Airhihenbuwa, 1992; Garcés et al., 2006; Scarinci et al., 2003).

Although the PEN-3 model takes into account cultural sensitivity and appropriateness in the data collection process and intervention development, we believe that there are other components that may be relevant when examining primary and secondary prevention of cervical cancer among Latina immigrants. These components are addressed in the HBM. Under the HBM, individuals will change their behavior(s) to prevent a particular disease if (a) they consider themselves as *susceptible* to the disease or condition (e.g., they can be exposed to HPV), (b) if they perceive that such disease or condition can have *serious consequences* (e.g., HPV can lead to cervical cancer which can be fatal), (c) they perceive that they are threatened by the disease or condition, (d) they perceive that engagement in a particular behavior (e.g., getting screening) will be *beneficial* in reducing the susceptibility to and/or the severity of the disease, and (e) they believe that the benefits outweigh the *barriers* or *costs* (Rosenstock, 1990). Rosenstock (1990) argues that the concept of self-efficacy (i.e., the individual’s belief that he or she can perform the *action* to prevent a particular disease or condition) should be added to the HBM. The final model incorporates the components of the PEN-3 and the HBM (see Figure 1).

To make our proposed intervention culturally relevant, we identified specific cultural values that are considered to be central in the Latino culture and may play a role in cervical cancer prevention. It has been suggested that the importance of family (*familiarismo*) is one of the key Latino values (Mendoza & Petersen, 2000). Family members tend to rely on each other for support when dealing with problems and difficulties (including health problems). The concept of familiarismo also involves the extended family, which is made up of blood

relatives as well as close friends (“compadres” and “comadres”; Marin & Marin, 1991). This is particularly relevant when dealing with immigrants. When coming to a new country, Latinos tend to turn to their co-nationals for support and assistance (Mendoza & Petersen, 2000). These communities can sometimes behave like families with extremely close ties (Marin & Marin, 1991).

Being an allocentric culture, Latinos tend to trust individuals more than institutions. They tend to prefer personal and individual attention and seek relationships that are nurturing, intimate, and respectful rather than confrontational (*personalismo*; Marin & Marin, 1991; Mendoza & Petersen, 2000). Given the traditional gender role norms in the Latino culture, Latino men tend to be dominant and women tend to be submissive to and dependent on their husbands and other males (*machismo*; Mendoza & Petersen, 2000). These “uneven” gender role norms have important implications for primary prevention of cervical cancer, because women may lack the negotiation skills and assertiveness necessary to engage in safe sexual practices. And finally *fatalismo*, which refers to the acceptance that things cannot be changed and control is usually placed in God’s hands (Chavez et al., 1997).

Developing a Program Plan

Once the matrices were in place, we proceeded with writing the intervention manuals. The intervention consisted of eight sessions (six group sessions and two individual sessions; see Table 3). There was a behavioral cue associated with each session. In the first session, participants receive a “friendship box” to keep all the information cards as well as a bracelet. In each session, a charm corresponding to the knowledge and skill learned was added to the bracelet.

Based on evidence from the literature review (Fernández et al., 2009b; Navarro et al., 1998; Navarro et al., 2000), we elected to employ lay health educators (LHEs) for intervention delivery as they are from the targeted community, they have the ability to reach the unreached, they are able to tailor health messages to the target audience, and above all, they are trusted individuals in the community.

Planning for Adoption in Implementation

Once the intervention was developed, we began by first eliciting feedback from LHEs and lay health advisors (volunteers) who were already participating in another program. Then, the intervention was piloted among 10 Latina immigrants meeting the inclusion criteria for the trial. Because modifications and suggestions were minor, only one set of pilot testing was conducted.

Once the intervention was finalized, operation and training manuals and strategies were finalized, including recruitment and retention strategies. Recruitment was done by literally canvassing the community to first identify the potential recruitment sites. Once the sites were identified, LHEs used a door-to-door approach to invite women to participate in the program. In terms of retention efforts, we implemented multiple strategies that include contact with participants at least once a month: phone calls, quarterly newsletters, and quarterly pot-luck dinners. Also, LHEs kept a detailed record on all participants ranging from contacts initiated by the participant and/or educator to special celebrations (e.g., birth of a child, husband’s illness).

Creating Evaluation Plans and Instruments

The evaluation consisted of process and outcome evaluation. Process evaluation or treatment fidelity was addressed at five levels based on the NIH Behavior Change Consortium recommendations (study design, staff training, delivery of treatment, receipt of treatment,

and enactment of treatment skills) as outlined in Table 4 (Bellg et al., 2004). Outcome evaluation included assessments of all components of the proposed theoretical models as well as the proposed primary and secondary outcomes. The outcome evaluation consisted of baseline, postintervention, and 12- and 24-month follow-up assessments.

DISCUSSION

The intervention development process began with the rapid growth of the Latino population in the Southern states coupled with the evidenced cervical cancer disparities between Latinas and Whites. Through IM, we were able to establish a logical planning process (taking into account the needs and assets in these new communities) based on theoretical models of behavior change and intervention development (PEN-3 and HBM). The conception of this study was based on our own difficulties in finding articles in the literature that detail step by step the process of intervention development. With a few exceptions (Fernandez, Gonzales, Tortolero-Luna, Partida, & Bartholomew, 2005; Gans et al., 2003), most papers allude to intervention development, but their primary focus is on methodology and results. Therefore, we made an attempt to report, in detail, all the steps that were taken and how decisions were made with the intent of providing some insights to other investigators who plan to develop theory-based, culturally relevant interventions.

In this process, we learned a number of lessons. Consistent with the experience of Gans and colleagues (Gans et al., 2003), the development of a well-thought-out intervention took more time and resources than initially anticipated. The development of this intervention took years and multiple funding mechanisms. Because little was known about cervical cancer screening among Latina immigrants in the United States, we needed to gain a better understanding of the sociocultural factors associated with two very distinct behaviors (Pap smear and sexual risk reduction) that not only required different methodologies (focus groups vs. individual interviews) but also different conceptualizations.

In the process of doing the needs assessments, it became clear to the investigators that a group randomized trial would be more appropriate than randomization at the individual level given the power of word of mouth in this population as well as suggestions by the target audience about hosting the sessions where they lived. The use of group-randomized designs is particularly widespread in the evaluation of health care and screening strategies. Although randomization of individuals would be more desirable from the perspective of statistical power, it was unfeasible from an operational point of view in this proposed project. Randomization of subjects in groups, rather than each individual separately, has important consequences for sample size estimation, interpretation, and analysis. The groups of participants are likely to be heterogeneous, giving rise to a component of variation that one must take into consideration. In addition, individuals within a group are more likely to resemble each other more than individuals in different groups, thereby violating the assumption of statistical independence between subjects.

However, these issues can be addressed in the statistical analysis whereas threats to internal validity (e.g., diffusion of treatment, compensatory rivalry, and resentful demoralization) could not. Given the powerful influence of word of mouth among Latinos, we could minimize these threats by including participants who are likely to talk to each other in the same group.

Community involvement, made possible through relationships forged during previous outreach efforts, cannot be underscored enough. In this process, it was critical to receive the input of the target audience as well as the staff. However, being an unassertive culture, it takes time to establish trust so honest feedback can be obtained rather than socially desirable

answers. The involvement of our volunteers from a parallel outreach program in the community was crucial to establishing trust in the community and recruiting and retaining such a large number of participants in a randomized clinical trial ($n = 543$).

A third lesson was flexibility. The goals and proposed methodology were fluid and changed between the submission of grant proposals and implementation in the community. This flexibility contributed to the process of establishing trust in the community because it was not the academic institution dictating how assessments and intervention development were going to take place. Both sides (community and academicians) contributed to the process so that a final product could be obtained without sacrificing the scientific integrity of the project or the integrity of the community. For example, initially, we proposed having a control group addressing general information. However, in our needs assessment we identified a major interest in the community in learning about nutrition and diabetes prevention. As such, we developed a second intervention to address these needs.

The development of a “culturally relevant” intervention is not readily apparent at the inception of a needs assessment. Through the assessments, the relevant aspects of the culture became more salient, and it is only through carefully listening and reading “between the lines” that these nuances could be incorporated in the behavior change intervention. Utilizing cultural values to reinforce the messages without running the risk of being stereotypical is a very sensitive matter. How these values are incorporated within an intervention is critical to the process. For instance, the “collectivism” or reliance on each other was openly reinforced in every session and clearly used as a motivator for women to share with one another and help each other. On the other hand, the “machismo” was handled in a completely different manner. To promote partner communication, we needed to understand this “cultural value” so we could empower participants without putting them at risk (e.g., domestic violence), but not openly address this value with participants.

CONCLUSION

Despite the great advances in cervical cancer discovery and development as well as implementation of novel strategies in cancer prevention and control, cervical cancer disparities still persist between Whites and Latinas, particularly among Latina immigrants. As such, the development, implementation, and evaluation of theory-based, culturally relevant interventions are an important step in narrowing this gap. However, there are a limited number of published papers on how to develop such interventions. The use of IM is a promising methodology in thinking logically and “completing the puzzle” in a very organized and well-thought-out manner. It has helped to facilitate the development of a novel intervention that focused on Latina immigrants which could be used as a template for interventions aimed at increasing primary and secondary prevention of cervical cancer in this population.

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REFERENCES

- Airhihenbuwa, CO. Health promotion and disease prevention strategies for African Americans: A conceptual model. In: Braithwaite, RL.; Taylor, SE., editors. Health issues in the Black community. San Francisco, CA: Jossey-Bass; 1992. p. 267-280.
- American Cancer Society. Cancer facts & figures, 2009. Atlanta, GA: Author; 2009. Retrieved from http://www.cancer.org/docroot/STT/content/STT_1x_Cancer_Facts_Figures_2009.asp

- Bartholomew, LK.; Parcel, GS.; Kok, G.; Gottlieb, NH. *Intervention mapping: Designing theory- and evidence-based health promotions programs*. Mountain View, CA: Mayfield; 2001.
- Bazargan M, Bazargan SH, Farooq M, Baker RS. Correlates of cervical cancer screening among underserved Hispanic and African-American women. *Preventive Medicine*. 2004; 39:465–473. [PubMed: 15313085]
- Bellg AJ, Borelli B, Resnick B, Hecht J, Minicucci DS, Ory M, Czajkowski S. Treatment Fidelity Workgroup of the NIH Behavior Change Consortium. Enhancing treatment fidelity in health behavior change studies: Best practices and recommendations from the NIH Behavior Change Consortium. *Health Psychology*. 2004; 23:443–451. [PubMed: 15367063]
- Byrd T, Chavez R, Wilson KM. Barriers and facilitators of cervical cancer screening among Hispanic women. *Ethnicity & Disease*. 2007; 17:129–134. [PubMed: 17274222]
- Centers for Disease Control and Prevention. *Compendium of HIV prevention interventions with evidence of effectiveness*. Atlanta, GA: Author; 1999.
- Chavez LR, Hubbell FA, McMullin JM, Martinez RG, Mishra SI. Structure and meaning in models of breast and cervical cancer risk factors: A comparison of perceptions among Latinas, Anglo women, and physicians. *Medical Anthropology Quarterly*. 1995; 9:40–74. [PubMed: 7697550]
- Chavez LR, Hubbell FA, Mishra SI, Valdez RB. The influence of fatalism on self-reported use of Papanicolaou smears. *American Journal of Preventive Medicine*. 1997; 13:418–424. [PubMed: 9415785]
- Dickey LL, Petitti D. A patient-held mini-record to promote adult preventive care. *Journal of Family Practice*. 1992; 34:457–463. [PubMed: 1556540]
- Fernández ME, Diamond PM, Rakowski W, Gonzales A, Tortolero-Luna G, Williams J, Morales-Campos DY. Development and validation of a cervical cancer screening self-efficacy scale for low-income Mexican American women. *Cancer Epidemiology and Biomarkers Prevention*. 2009a; 18:866–875.
- Fernandez ME, Gonzales A, Tortolero-Luna G, Partida S, Bartholomew LK. Using intervention mapping to develop a breast and cervical cancer screening program for Hispanic farm workers: Cultivando la Salud. *Health Promotion Practice*. 2005; 6:394–404. [PubMed: 16210681]
- Fernández ME, Gonzales A, Tortolero-Luna G, Williams J, Saavedra-Embese M, Chan W, Vernon SW. Effectiveness of Cultivando la Salud: A breast and cervical cancer screening promotion program for low-income Hispanic women. *American Journal of Public Health*. 2009b; 99:936–943. [PubMed: 19299678]
- Gans KM, Kumanyika SK, Lovell HJ, Risica PM, Goldman R, Odoms-Young A, Lasater TM. The development of *SisterTalk*: A cable TV-delivered weight control program for Black women. *Preventive Medicine*. 2003; 37:654–667. [PubMed: 14636799]
- Garcés IC, Scarinci IC, Harrison L. An examination of sociocultural factors associated with health and health care seeking among Latina immigrants. *Journal of Immigrant and Minority Health*. 2006; 8:377–385. [PubMed: 16636902]
- Hubbell FA, Chavez LR, Mishra SI, Valdez RB. Beliefs about sexual behavior and other predictors of Papanicolaou smear screening among Latinas and Anglo women. *Archives of Internal Medicine*. 1996; 116:2353–2358. [PubMed: 8911242]
- Koniak-Griffin D, Lesser J, Nyamathi A, Uman G, Stein JA, Cumberland WG. Project CHARM: An HIV prevention program for adolescent mothers. *Family and Community Health*. 2003; 26:94–107. [PubMed: 12802115]
- Marin, G.; Marin, BV. *Research with Hispanic populations*. Newbury Park, CA: Sage; 1991.
- Mendoza M, Petersen MC. New Latino immigration to Tennessee: Practicing culturally sensitive health care. *Journal of the Tennessee Medical Association*. 2000; 93:371–376.
- Navarro AM, McNicholas JL, Senn KL, Kaplan RM, Campo MC, Roppe B. Use of cancer screening tests among Latinas: One and two years after participation in the Por La Vida Darnos Cuenta program. *Women and Cancer*. 2000; 2:23–30.
- Navarro AM, Senn KL, McNicholas LJ, Kaplan RM, Roppe B, Campo MC. Por La Vida model intervention enhances use of cancer screening tests among Latinas. *American Journal of Preventive Medicine*. 1998; 15:32–41. [PubMed: 9651636]

- Pan American Health Organization. A brief snapshot of the situation: Cervical cancer in Latin America and the Caribbean, 2001. 2001 Retrieved from <http://www.paho.org/English/HCP/HCN/CCBriefSnapshot.htm>.
- Pisani P, Parkin DM, Bray F, Ferlay J. Estimates of worldwide mortality from 25 cancers in 1990. *International Journal of Cancer*. 1999; 83:870–873.
- Rock CL, Michael CW, Reynolds K, Ruffin MT. Prevention of cervix cancer. *Critical Reviews in Oncology/Hematology*. 2000; 33:169–185. [PubMed: 10789491]
- Rosenstock, IM. The Health Belief Model: Explaining health behavior through expectancies. In: Glanz, K.; Lewis, FM.; Rimer, BK., editors. *Health behavior and health education: Theory, research, and practice*. San Francisco, CA: Jossey-Bass; 1990. p. 39-61.
- Scarinci IC, Beech BM, Kovach KW, Bailey T. An examination of sociocultural factors associated with cervical cancer screening among low-income Latina immigrants of reproductive age. *Journal of Immigrant Health*. 2003; 5:119–128. [PubMed: 14512766]
- Shepherd J, Peersman G, Weston R, Napuli I. Cervical cancer and sexual lifestyle: A systematic review of health education interventions targeted at women. *Health Education and Research*. 2000; 15:681–694.
- Swan J, Breen N, Coates RJ, Rimer BK, Lee NC. Progress in cancer screening practices in the United States: Results from the 2000 National Health Interview Survey. *Cancer*. 2003; 97:1528–1540. [PubMed: 12627518]
- Tortolero-Luna G, Mitchell MF, Swan DC, Tucker RA, Wideroff L, Icenogle JP. A case-control study of human papillomavirus and cervical squamous intraepithelial lesions (SIL) in Harris County, Texas: Differences among racial/ethnic groups. *Cadernos de Saúde Pública*. 1998; 14:149–159. [PubMed: 9819473]
- U. S. Department of Health and Human Services. *The Surgeon General's call to action to promote sexual health and responsible sexual behavior*. Washington, DC: Author; 2001.
- Valdez A, Banerjee K, Ackerson L, Fernandez M. A multimedia breast cancer education intervention for low-income Latinas. *Journal of Community Health*. 2002; 27:33–51. [PubMed: 11845940]
- Yabroff KR, Mangan P, Mandelblatt J. Effectiveness of interventions to increase Papanicolaou smear use. *Journal of the American Board of Family Practice*. 2003; 16:188–203. [PubMed: 12755245]
- Yancey AK, Tanjasiri SP, Klein M, Tunder J. Increased cancer screening behavior in women of color by culturally sensitive video exposure. *Preventive Medicine*. 1995; 24:142–148. [PubMed: 7597016]
- Zambrana RE, Breen N, Fox SA, Gutierrez-Mohamed ML. Use of cancer screening practices by Hispanic women: Analysis by subgroup. *Preventive Medicine*. 1999; 29:466–477. [PubMed: 10600427]
- Zapka JG, Harris DR, Hosmer D, Costanza ME, Mas E, Barth R. Effect of a community health center intervention on breast cancer screening among Hispanic American women. *Health and Services Research*. 1993; 28:223–235.

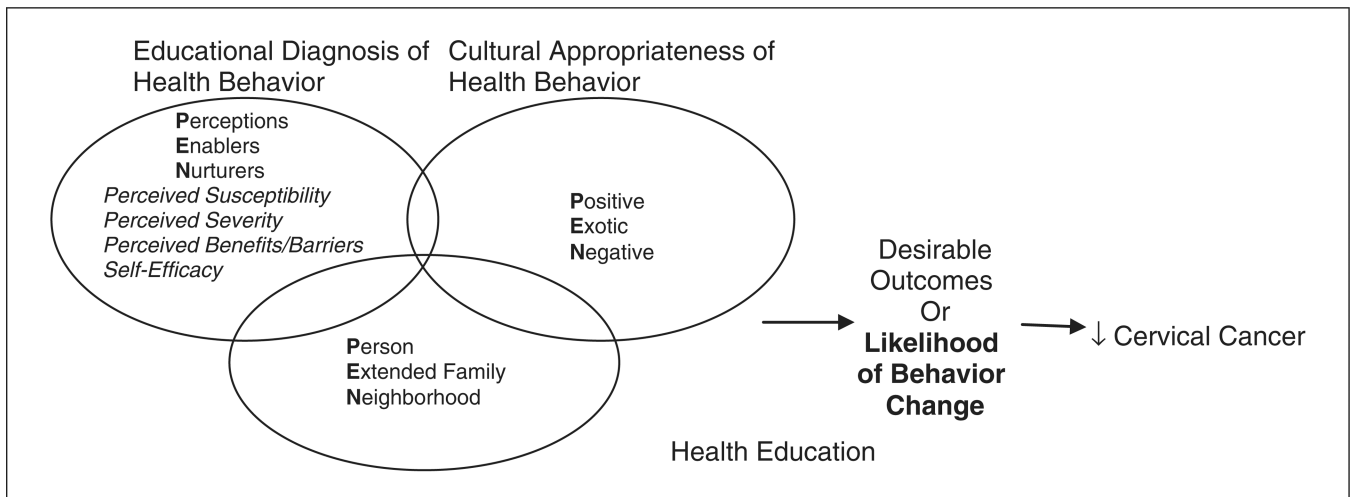


FIGURE 1. Theoretical Models (PEN-3 and Health Belief Model) Used in the Intervention Development

SOURCE: Adapted from Airhihenbuwa (1992) and Rosenstock (1990).

TABLE 1

Summary of Preliminary Findings Based on the PEN-3 and HBM

Theoretical Constructs	Preliminary Findings
Perceptions (PEN-3)	<p>Positive</p> <ul style="list-style-type: none"> • Knowledge regarding the role of family history and multiple partners when it comes to cervical cancer • Knowledge regarding the importance of the Pap smear • Some knowledge that cervical cancer can be transmitted sexually • Belief that fidelity and condom use can help to prevent STIs • Motivation to be healthy in order to take care of family and work • Belief they have control over their own health and are interested in engaging in preventive practices • Receptiveness to information and health education; doubt that they might be misinformed <p>Negative</p> <ul style="list-style-type: none"> • Lack of knowledge regarding HPV, HPV infection, cervical cancer, screening • Stoic attitude toward health and illness • Delay in seeking care for health-related problems
Enablers (PEN-3)	<p>Positive</p> <ul style="list-style-type: none"> • Trust in some community-based organizations, local churches, and community health advisors <p>Negative^a</p> <ul style="list-style-type: none"> • Lack of health insurance, lack of transportation, cost, language barrier • Lack of knowledge on where to obtain the Pap smear; provider never ordered a Pap smear • Differences in health care system from home country (free clinics) • Lack of trust in providers and interpreters • Perceived discrimination at health clinics • Fear of going to the doctor because of legal status
Nurturers (PEN-3)	<p>Positive</p> <ul style="list-style-type: none"> • Cultural norms to be monogamous; they tend to have few sexual partners • Strong alliance to other Latinas and strong desire to help each other • No opposition from spouses in getting health care for themselves <p>Negative</p> <ul style="list-style-type: none"> • They do not know how to discuss sexual practices with partners • Opposition from spouses to obtain Pap smear if provider is male
Perceived susceptibility (HBM)	<p>Negative</p> <ul style="list-style-type: none"> • Perception that they are not at risk for cervical cancer since they do not have the “perceived risk factors” (e.g., lack of hygiene—they clean themselves well after having sexual intercourse) • Preventive care is not a priority
Perceived severity (HBM)	<ul style="list-style-type: none"> • Cervical cancer is perceived as a deadly disease
Perceived barriers (HBM)	<p>Negative (because of the nature of this component, the “positive” classification does not apply)</p>

Theoretical Constructs	Preliminary Findings
Perceived benefits (HBM)	<ul style="list-style-type: none"> • Structural (language, lack of transportation, lack of health insurance, do not know where to go)^a • Embarrassment and lack of motivation • Reluctance in having a health care professional touch them (particularly if male) <p>Positive</p> <ul style="list-style-type: none"> • Belief that Pap smear can help to detect cervical cancer early; desire to be healthy • Belief that communication with partners can be helpful to prevent HPV infection <p>Negative</p> <ul style="list-style-type: none"> • <20% believe that if cervical cancer is detected early, the chances of survival are excellent or good • Fear of knowing the Pap smear results—it is better not to know it
Self-efficacy (HBM)	<p>Positive</p> <ul style="list-style-type: none"> • 50% of women have asked their partners about their sexual history • Desire to communicate better with their partners, but they do not know how <p>Negative</p> <ul style="list-style-type: none"> • Lack skills in terms of self-efficacy for screening and primary prevention

NOTE: HBM = Health Belief Model; HPV = human papilloma virus; STI = sexually transmitted infection.

^a. Structural perceived barriers overlap with negative enablers

TABLE 2

Proposed Intervention: Objectives and Strategies as They Relate to the PEN-3 and Health Belief Model

Theoretical Constructs	Intervention Objectives	Strategies—Group Sessions	Strategies—Individual Sessions
Perceptions (PEN-3)	<ul style="list-style-type: none"> Reinforce the knowledge, attitudes, and beliefs that lead to engaging in healthy behaviors Promote knowledge about HPV (infection and testing), cervical cancer, and screening Recognize the importance of taking care of themselves in order to be healthy, including seeking care 	<ul style="list-style-type: none"> Provision of education and knowledge Cognitive restructuring Challenge stoic attitude toward health and illness Increased perceived behavioral control over their health Emphasize ethnic and gender pride 	<ul style="list-style-type: none"> Personalize the education (e.g., reinforcement of personal motivators to be healthy) Review homework—“pie” Correct misinformation Promote awareness
Enablers (PEN-3)/Perceived Barriers (HBM) ^a	<ul style="list-style-type: none"> Reinforce the trust in church-based organizations and churches and promote trust in providers and interpreters Decrease structural barriers to screening Decrease or eliminate fear about learning Pap smear results Promote knowledge regarding the health care system in the United States and where to obtain screening 	<ul style="list-style-type: none"> Education, including education about medical and social services (including faith-based) available in the community^b Problem solving Counter the negative barriers of seeking screening Communication skills with providers and clinic personnel 	<ul style="list-style-type: none"> Review of homework—problem-solving skills Identify and reduce individual barriers (e.g., make provisions for travel and child care) Facilitate obtaining and scheduling appointments, reminders by lay health educators
Nurturers (PEN-3)	<ul style="list-style-type: none"> Provide tools and skills to seek social support Reinforce the importance of reliance on each other Reinforce cultural norms to be monogamous Improve communication with sexual partners: refusal skills, assertiveness, talking with partners about their sexual history 	<ul style="list-style-type: none"> Exchange of phone numbers and contact information among participants (if willing to do so) Training and guidance Role-playing Graded exposure Coping cards Cognitive rehearsal Use progressive goal setting Verbal reinforcement 	<ul style="list-style-type: none"> Identify and address specific areas of difficulty and strengths in obtaining (and maintaining) social support for screening Individualized positive reinforcement of successful attempts to engage in the learned strategies (e.g., communication with partners)
Perceived susceptibility (HBM)	<ul style="list-style-type: none"> Provide information on HPV infection risk factors as well 	<ul style="list-style-type: none"> Education—verbal and written 	<ul style="list-style-type: none"> Identify individual risk levels

Theoretical Constructs	Intervention Objectives	Strategies—Group Sessions	Strategies—Individual Sessions
	<ul style="list-style-type: none"> as information that every sexually active woman is at risk Provide information on the importance of preventive care with concrete examples and testimonials 	<ul style="list-style-type: none"> culturally relevant materials Discuss the role of family history and sexual behavior Reinforce that all sexually active women are at risk for HPV infection 	<ul style="list-style-type: none"> Link sexual practices and risks based on personal sexual history, current sexual practices, as well as environmental and partner factors
Perceived severity (HBM)	<ul style="list-style-type: none"> Provide information that although cervical cancer is a serious condition, it can be cured if detected early 	<ul style="list-style-type: none"> Education—verbal and written culturally relevant materials Testimonials of survivors New approaches available for early detection 	<ul style="list-style-type: none"> Review of cognitive distortions and early detection Specify consequences of sexual risk behaviors and cervical cancer
Perceived benefits (HBM)	<ul style="list-style-type: none"> Increase the perceived advantages associated with open communication with sexual partners Emphasize the advantages of early detection and treatment 	<ul style="list-style-type: none"> Decision making (list of pros and cons) Group discussion of the pros of sexual communication with partners Group discussion of perceived advantages of early detection 	<ul style="list-style-type: none"> Cognitive restructuring based on the list of pros and cons
Self-efficacy (HBM)	<ul style="list-style-type: none"> Increase self-efficacy for engaging in both primary and secondary prevention of cervical cancer Promote self-responsibility and personal control 	<ul style="list-style-type: none"> Role-playing Empower women to take personal control over their reproductive health Increase confidence in initiating safer-sex conversations, negotiating safer sex, and refusing unwanted or unsafe sexual encounters Acknowledge success at group level Ask for assistance from the group 	<ul style="list-style-type: none"> Positive reinforcement Anxiety reduction Identify and address specific sexual situations in which participant may have low self-confidence to protect her health Reinforce personal success

NOTE: HBM = Health Belief Model; HPV = human papilloma virus.

^a. Structural perceived barriers overlap with negative enablers. Therefore, they were grouped in the same category for intervention purposes.

^b. Participants received a “directory”, including medical and social services available in the community. This directory provides hours, costs, availability of interpreters, services, etc.

TABLE 3

Content of the Group and Individual Sessions

Session	Content
Group Session 1	<ul style="list-style-type: none"> • Overview of the program • Importance of relying on each other
Group Session 2	<ul style="list-style-type: none"> • Cancer • Cervical cancer and screening • Problem-solving skills
Group Session 3	<ul style="list-style-type: none"> • Communication skills • Navigating the health care system in the United States
Group Session 4	<ul style="list-style-type: none"> • Personal responsibility • Self-esteem • Goal setting
Individual Session 1	<ul style="list-style-type: none"> • Reinforcement of messages discussed in group sessions in the context of personal relevance to each participant
Group Session 5	<ul style="list-style-type: none"> • Partner communication • Human papilloma virus
Individual Session 2	<ul style="list-style-type: none"> • The primary focus was on partner communication tailoring the information and skills to each participant
Group Session 6	<ul style="list-style-type: none"> • Integration of knowledge and skills

TABLE 4

Treatment Fidelity Strategies Used in the Intervention

Level	Goals	Strategies
Study design	<ul style="list-style-type: none"> • Ensure same treatment dose within conditions • Ensure equivalent dose across conditions 	<ul style="list-style-type: none"> • Lay health educators completed a “session evaluation” form for each session to document the length of the session, difficulties, etc. • They also kept a contact log for each participant (including phone calls initiated by participants, completion of homework assignments, etc.) • Both interventions had the same number of sessions and contact hours • Dosage analyses for exposure to intervention was planned as part of the statistical analysis
Staff training	<ul style="list-style-type: none"> • Standardize training • Ensure staff skills acquisition • Minimize “drift” in staff skills • Accommodate staff differences 	<ul style="list-style-type: none"> • All staff had a detailed manual of operations including all components of the research project • To minimize “drifts” and accommodate staff differences, we conducted booster sessions and monthly meetings as well as in vivo observations of data collection and intervention and control sessions with provision of feedback using a “quality assurance” form
Delivery of treatment	<ul style="list-style-type: none"> • Monitor and control for participant perceptions of nonspecific treatment effects (e.g., perceived warmth, credibility) • Ensure adherence to intervention and control conditions protocol (content and dose) • Minimize contamination across conditions 	<ul style="list-style-type: none"> • Data analyses were conducted to compare desirable outcomes and participants’ satisfaction over time and across lay health educators • Provision of manual of operations and sporadic observation as described above • Revision of lay health educator logs and “session evaluation forms” • Use of different lay health educators to provide the cervical cancer and nutrition interventions • Assessment data were collected by data collectors, and NOT the lay health educators
Receipt of treatment	<ul style="list-style-type: none"> • Ensure that participants understand the information provided • Ensure that participants are able to use the skills taught (cognitive-behavioral) 	<ul style="list-style-type: none"> • Program manager interviewed a random sample of participants (treatment fidelity assessments) addressing knowledge and skills discussed in the sessions in order to determine whether the intervention had been received • Posttest and 12- and 24-month follow-up assessments asked information on receipt of treatment
Enactment of treatment skills	<ul style="list-style-type: none"> • Ensure that participants use the skills taught 	<ul style="list-style-type: none"> • During the “treatment fidelity” interviews described above, participants were also provided with hypothetical situations and asked to provide strategies for dealing with these situations