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Salud es Vida: A Cervical Cancer Screening Intervention for Rural Latina Immigrant Women

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Abstract

Background—This study examined the feasibility and efficacy of *Salud Es Vida* – a *promotora*-led, Spanish-language educational group session on cervical cancer screening (Pap tests), self-efficacy (belief in ability to schedule and complete a Pap test), and knowledge among immigrant Hispanic/Latina women from farmworker backgrounds. These women are disproportionately burdened with cervical cancer, with mortality rates significantly higher than non-Hispanic whites.

Methods—The two-arm, quasi-experimental study was conducted in four rural counties of Southeast Georgia in 2014–15. Hispanic/Latina immigrant women aged 21–65 years and overdue for a Pap test were included as intervention (N = 38) and control (N=52) group participants. The intervention was developed in partnership with a group of *promotoras* to create the toolkit of materials which includes a curriculum guide, a brochure, a flipchart, a short animated video, and in-class activities.

Results—Twelve (32%) intervention group participants received the Pap test compared to 10 (19%) control group participants (p = .178). The intervention group scored significantly higher on both cervical cancer knowledge recall and retention than the control group (p < .001). While there

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was no statistically significant difference in cervical cancer screening self-efficacy scores between the group participants, both groups scored higher at follow-up, adjusting for the baseline scores.

Conclusion—The group intervention approach was associated with increased cervical cancer knowledge, but not uptake of Pap test. More intensive interventions using patient navigation approaches or *promotoras* who actively follow participants or conducting one-on-one rather than group sessions may be needed to achieve improved screening outcomes with this population.

Keywords

Cervical cancer; Cancer screening; Promotora; Immigrant; Hispanics/Latinos

Introduction

Hispanics/Latinas in the United States are disproportionately burdened with cervical cancer, with mortality rates 50% higher than non-Hispanic whites. This health disparity has been attributed largely to lower screening rates and delayed follow up care after receiving abnormal screening results [1]. Since Hispanics/Latinos represent the largest ethnic minority group in the U.S., efforts to improve cervical cancer prevention among this population will have a significant public health impact on incidence and mortality rates [28]. There exists variability in cervical cancer incidence and mortality rates among Hispanic/Latino subgroups, with higher rates as well as greater barriers to screening among newer immigrant Hispanic/Latina women in the Midwest, Southeast, and those living near the United States-Mexico border region, all of whom are primarily of Mexican origin [36, 32, 21]. Research has shown that some Hispanic/Latino groups such as Puerto Ricans and Cubans have higher screening rates than Mexican Americans [1].

Hispanic/Latino migrant and seasonal farmworkers are characterized by very low rates of health insurance coverage (less than 25% insured), and thus by extension, screening rates are lower among this group [2]. Approximately 90% of the farmworkers in the study area – southeast Georgia – are men [19]. However, farmworker women are an understudied group with regard to cancer incidence and mortality, and there is limited evidence demonstrating the effectiveness of cervical cancer screening interventions targeting this population [4, 21]. The vast majority of farmworkers in the U.S. are of Mexican origin, and more than half are undocumented [23]. Farmworkers face numerous individual and structural barriers to cancer screening. Individual barriers include limited awareness of cancer screening, embarrassment, fear of a positive diagnosis, lack of time, child care issues, low self-efficacy for screening, and low acculturation. Structural barriers affecting screening adherence include poverty, lack of health insurance, lack of transportation, lack of a regular healthcare provider, stress related to one's immigration status, and distrust of healthcare institutions [7, 10, 22]. Given the numerous barriers, lower screening compliance and delayed follow-up care for abnormal cervical cancer screening tests increase the risk for later stage diagnosis of cervical cancer in this population.

According to the American Cancer Society, women should start receiving Pap tests at 21 and continue to have the exam every three years until age 29. Beginning at the age of 30, women should be screened every five years with the combination of HPV DNA testing and either

conventional or liquid-based testing until the age of 65, or continue regular Pap testing every three years. The screening interval recommendation changed from an annual exam to every three years in 2012 because it was determined that it takes usually 10 to 20 years for advanced cervical cancer to develop [27].

Screening programs aimed at priority populations should include tailored and targeted messages to increase awareness of and adherence to recommended prevention screening practices [15, 14, 16]. Efforts to increase cancer screening among Hispanic/Latina women have used various educational strategies including mass media, clinic-based strategies, church-based strategies, and community health workers (*promotoras de salud* in Spanish) [21]. One Texas study successfully increased Pap test screening among Hispanic/Latina women in Texas using small media (videos and printed materials) combined with community health worker and navigation approaches [13]. In a different multi-site study, the community health worker intervention AMIGAS trial, 52% of participants not up-to-date with their Pap tests completed them within six months compared with 25% of women in the control group [5]. While systematic reviews have concluded that one-on-one education is an effective method to increase cervical cancer screening, there is insufficient evidence to demonstrate the effectiveness of small group education approaches to increase screening [26].

Following a theoretical framework which included Social Cognitive Theory and Popular Education, the intervention *Salud es Vida* ("Health is Life") was developed which addressed both individual and structural factors affecting screening behavior [3, 18, 34]. The aim of this study was to evaluate the feasibility and efficacy of a *promotora*-led, Spanish-language educational group session on cervical cancer screening (Pap tests), self-efficacy (belief in ability to schedule and complete a Pap test), and knowledge. The study participants were immigrant Hispanic/Latina women in southeast Georgia from farmworker backgrounds. The small media intervention combines group education sessions (or *charlas*, Spanish for discussions) with information about cervical cancer screening resources, working jointly with *promotoras* and community partners.

Methods

Setting

The study area was southeast Georgia, specifically Bulloch, Evans, Tattnall, and Toombs counties located in the northern section of Georgia Public Health District 9.2. Of the four counties, Bulloch County has the largest population based on 2014 estimates of 72,087 (3.6% Hispanic), followed by Toombs (pop. 27,282, 11.3% Hispanic), Tattnall (pop. 25,224, 10.9% Hispanic), and Evans (pop. 10,898, 11.9% Hispanic) [33]. Toombs, Tattnall, and Evans counties served as the intervention site based on their proximity to large farms and higher percentage of Hispanic/Latino population, and Bulloch County served as the control site for the study. Bulloch County is largely separated from the other counties by a major East-West interstate highway connecting Savannah and Macon. Each region is served by a separate large major retailer. Latina/Hispanic women in Bulloch County primarily used the health department to obtain Pap tests, and in the three intervention counties, women used

either the health department in each county or one federally-qualified community health center located in Tattnall County.

Participant Recruitment

To recruit participants, the study team benefited from the assistance of community partners, such as commercial farms and churches, special events, such as school meetings, and word-of-mouth using flyers and posters. These promotional materials were posted in community organizations, health departments, community health centers, job training centers, convenience stores, and workplaces. To qualify for the study, female participants reported they had not received a Pap test in 2 years or more, were between 21 and 65 years of age and a Hispanic/Latino immigrant. It was not uncommon for participants to arrive at either the intervention or control group session and not meet study inclusion criteria for last Pap test date. The overwhelming majority of participants who did not qualify had received a recent Pap test. The participants who did not qualify were not retained in the study for follow-up, and only participants who qualified for the study were included in the subsequent analysis. Participants received a stipend valued at $10 for completing surveys at each phase. Informed consent was obtained for all participants, and the study was approved by the - *blinded for review* - University Institutional Review Board.

Intervention

The intervention, *Salud es Vida*, was developed in partnership with a group of *promotoras* to create the toolkit of materials which included a curriculum guide, a brochure, a flipchart, a short animated video, and in-class activities. The development and evaluation of these materials has been described elsewhere [18, 35]. Group activities included an icebreaker, completion of a baseline survey, a cervical cancer knowledge pre-test/post-test, an introduction to cervical cancer using the video and flipchart, and a dialogue activity to explore barriers to healthcare such as childcare demands or transportation challenges. The brochures provided key information on healthcare facilities and served as an educational tool for the participants to share with their families and friends. Each *charla* lasted approximately 3 hours with an average of 7 participants per session. Seventeen classes were held between January 2014 and February 2015 and took place at churches, community organizations, businesses, and individual homes. The fidelity checklist used at each session found that all major steps in the curriculum were covered by the facilitator. Participants in the control group attended a nutrition class which took place at churches or individual homes. Twenty-one nutrition classes were held during the same time period. All group sessions were conducted in Spanish.

The baseline survey included questions on demographics (age, education, marital status, language acculturation measured by the Acculturation Scale for Mexican Americans (ASMA) [9], employment status), healthcare access (health insurance, regular healthcare provider), and cervical cancer screening history questions drawn from the HINTS survey [24]. A 15-item cervical cancer knowledge instrument was developed to reflect the educational content of the intervention and was administered at baseline, immediately following the class to measure recall, and at follow-up. There were also questions about cervical cancer fatalism, beliefs, social support, and sources of information scored on a 5-

point Likert-type scale from “strongly disagree” to “strongly agree” that were measured at baseline only [6]. There was a 10-item cervical cancer self-efficacy scale scored on a 5-item Likert-type scale ($\alpha = 0.88$) ranging from “very unsure” to “very sure” that were measured at baseline and follow-up [12]. Participants were contacted again after 3 months to administer the follow-up survey with a target of completing the follow-up by 6 months. The follow-up survey included the cervical cancer knowledge questions and self-efficacy scale as well as additional open-ended items about patient’s experiences in the healthcare setting for those reporting receiving a Pap test following the intervention.

The efficacy study utilized a two-arm, quasi-experimental design: one group receiving the intervention and the other group serving as the control. The following five steps were used to implement the intervention: (1) enlist and train *promotoras* to recruit Latina immigrant women (21 to 65 years old) who met inclusion criteria to be enrolled in the study; (2) implement small group education intervention sessions, or *charlas*, of 5–7 participants led by the *promotora*; (3) recruit a similar number of control participants to receive the nutrition class; (4) conduct baseline and follow-up surveys with the study participants who met inclusion criteria; and (5) conduct qualitative observations of educational sessions to measure intervention fidelity using checklists from the training materials.

Statistical Analysis

First, descriptive statistics were used to describe the demographic and clinical characteristics, as well as cervical cancer beliefs and sources of health information of study participants at baseline. Differences in categorical characteristics between the intervention and control groups were assessed using $\chi 2$ and Fisher exact tests and on continuous characteristics – using the unpaired *t* test. The equal variances assumption was tested using the Bartlett $\chi 2$ test.

It was hypothesized that the effect of the multi-component intervention would lead to increases in cervical cancer knowledge and improved self-efficacy for scheduling and completing Pap test screening. The $\chi 2$ test of independence was used to assess differences in obtaining a Pap test post-intervention between the groups based on self-report. The unpaired *t* test was used to assess differences between the groups in means of cervical cancer knowledge total scores at baseline pretest and posttest, and follow-up assessments, as well as in means of self-efficacy total scores and each item scores at baseline and follow-up.

The ANCOVA was used to test the differences in means of cervical cancer knowledge total scores at posttest versus pretest baseline assessment and follow-up versus posttest assessment, as well as in means of cervical cancer self-efficacy total scores, and each item at follow-up versus baseline. The McNemar test was used to determine changes in each cervical cancer knowledge recall item scores from pretest to posttest. Significant differences were assessed at the $\alpha=.05$ level. All tests were two-tailed. Analyses were conducted using Stata/MP 13.0 for Windows (StataCorp, Inc.).

Results

A total of 264 participants were screened for inclusion in the intervention condition, and 177 participants for the control group. Of this number, 86 women participated in the baseline intervention group, and 90 women in the control group. However, based on the study inclusion criteria, for the follow-up survey, only 38 of 86 intervention arm participants qualified to be retained in the study, and 52 of 90 control arm participants qualified. The total sample size for the study was 90 women. Bivariate statistics were analyzed for baseline data between those who qualified for the study (n = 90) compared to those who did not qualify (n = 86) for age, marital status, employment status, language preference, number of years of formal education, number of years living in the U.S., and baseline cervical cancer knowledge scores. There were no statistically significant differences on these variables between those who qualified for the study compared to those who did not. In the intervention group, 4 participants were lost to follow up, but none were lost in the control group.

There were no significant differences between intervention and control participants on baseline demographic characteristics (Table 1). The average age of the primarily Mexican immigrant women in the study was 39 years with nine years of formal schooling in their home country. These women had lived in the U.S. for an average of 13 years. Participants were primarily Spanish-speaking based on a score of .74 out of 4 on the ASMA language acculturation scale. The majority were married or living with a partner (78%), employed (66%), and renters (59%). Less than half had a regular health care provider (41%), and only one participant had health insurance (2%).

The majority of participants had received a Pap test (93%) at least once, 58 (64%) women had not received one in over two years, and 32 participants (36%) were over three years past due. There was a prevailing opinion among participants that women should receive a Pap test every year. Participants reported that the health facilities where they were attending – primarily either a health department or a community health center – had only recently (as of 2015) been telling patients they only needed a Pap test every three years instead of annually. This is evident in the results on the question about when women should receive their next Pap test. In the control group, 38 (73%) participants thought they should receive an annual Pap test in the baseline survey compared to 30 (58%) women in the follow-up survey, and in the intervention group 28 (74%) participants thought an annual Pap test should be done in the baseline survey compared to 17 (50%) women in the follow-up survey. Therefore, both groups experienced similar changes on this variable.

The survey measured participants' baseline cervical cancer beliefs and sources of health information (Table 2). These items were scored on a 5-point Likert-type scale from "strongly disagree" to "strongly agree." All participants recorded a high mean score (4.4) on the belief that the Pap test was the best method for early detection of cervical cancer, that receiving a Pap test would decrease worry (4.3), and that cervical cancer could be cured if detected early (4.2). Participants scored in the middle of the scale on their perceived likelihood of being diagnosed with cervical cancer (3.0) and whether their life would change dramatically if they had cervical cancer (3.8), both measures of cancer fatalism. Regarding sources of health

information, participants rated the internet (2.7) as slightly higher than TV (2.4) and newspapers (1.9), but all scores were on the lower range of the scale. Regarding influential others recommending Pap tests, participants scored in the middle range for doctors (3.5), *promotoras* (2.8), and spouses (3.7), indicating they believed they received more health-related advice from personal contacts than media sources.

In the follow-up survey, there were several open-ended questions about how women were treated when they received a Pap test. Participants reported they were treated well in the healthcare facilities, had reliable translation assistance if they needed it by bringing their own interpreter or being provided one by the facility, easily made their appointments, and received their results by phone, mail, or in person – with the exception of one individual. Some individuals surveyed explained that some health facilities required same day appointments for Pap tests which were inconvenient. Four individuals reported abnormal results requiring follow-up. The study coordinator contacted participants to ensure those with abnormal results were receiving appropriate follow-up care and to remind the ones that were over three years past due to have their Pap tests scheduled.

The primary outcome variable was receipt of a Pap test post-intervention (Table 3). Twelve (32%) participants received the Pap test in the intervention group and 10 (19%) participants received one in the control group ($p = .178$). Of the women who were not up-to-date with their Pap tests and did not report receiving a Pap test at posttest, the study coordinator was able to reach 19 women to provide information about where they could go to receive one.

The first secondary outcome was cervical cancer knowledge. This variable consisted of both knowledge recall (posttest) and retention (follow-up). For both recall and retention, the intervention group scored significantly higher on the knowledge questions than the control group. Detailed information about each baseline and recall knowledge item is listed in Table 4. Intervention group participants at posttest had the most trouble with the following three items from the set of True/False questions: 1) cervical cancer starts in the cervix, not the vagina; 2) an abnormal Pap test always means cervical cancer; and 3) cervical cancer can have no symptoms. One of the most difficult multiple choice questions for participants asked when a woman should begin to get a Pap test. The best answer was “after 21 or 3 years after sexual relations.” Many women however answered “after having babies” or “after first sexual relations.” There was a significant improvement in knowledge recall scores on 5 of the 15 items in the intervention group and no improvement in the control group (see Table 4). At posttest, the intervention group participants had higher total cervical cancer knowledge scores than the control group participants, adjusting for the pretest scores ($p < .001$). At follow-up, the intervention group participants also had higher total cervical cancer knowledge scores, adjusting for the posttest scores ($p = .047$) (data not shown).

The other secondary outcome variable was cervical cancer self-efficacy. There was no statistically significant difference between the group participants in the mean total scores at follow-up, controlling for the baseline scores ($p = 0.710$) (data not shown). Both groups scored high on this scale at follow-up, with a mean score for the intervention group of 44.2 and the control group with a mean score of 42.5, out of a maximum score of 50. The item-by-item scores are listed in Table 3. All values improved in both the intervention and the

control group. However, there were higher overall values for most items in the intervention group compared to the control group at follow-up, and two items approached statistical significance, “You can ask for a Pap test” and “You can discuss having a Pap test with your doctor.” The item with the lowest score at both baseline and follow-up in the intervention group was the item about whether the participant would still keep their Pap test appointment if they had to go to another clinic.

Discussion

The findings from this feasibility study using a group intervention approach suggest intervention efficacy for increasing cervical cancer knowledge; however, these secondary outcomes by themselves were not sufficient to increase cervical cancer screening rates in this Latina immigrant population. Because of the changing recommendations that occurred during our study, there might have been low uptake of cervical cancer screening in the intervention group due for a Pap test (12 out of 38 or 32%) because many women believed annual screening was no longer necessary and when they went for a Pap test they were told to return the following year. The null effect on the primary outcome might be explained by an external history effect of changing screening guidelines that occurred during the study. Moreover, the study did not use a patient navigator to help women access screening services, since the intervention was largely confined to the one-time group educational session. More intensive interventions using patient navigation approaches or *promotoras* who actively follow participants or conduct one-on-one rather than group sessions might be needed to achieve better screening outcomes with this population [5, 11].

In addition, there are several other examples in the literature where positive changes in screening uptake were observed in both the intervention and the control group from lay health advisor interventions aiming to increase Pap test compliance [25, 30, 31, 29]. The study finding of 32% of intervention participants reporting screening post-intervention was similar to another group intervention study which increased cervical cancer screening from 0% to 23% in a sample of 274 women [25]. However, at that time of these previous studies, the recommendation was for annual screening; therefore, these studies are not directly comparable with this study since the screening guidelines have since changed.

When working with Latina immigrant women in rural farmworker communities, there are significant transportation, time, and language barriers that may hinder women from actively engaging in preventive screening behaviors [2]. The follow-up time period overlapped with onion harvesting season in the spring and summer months. This time of year requires very long days of work, leaving no time for other activities. Expanding access to convenient mobile clinics which offer Pap tests as part of their services is recommended; however, the availability and regularity of these clinics is a challenge due to personnel and fiscal constraints which affect sustainability and geographical reach [17].

Health beliefs were largely consistent with biomedicine on several items such as knowing that the Pap test was the best way to find cervical cancer and that cervical cancer is curable if detected early by a Pap test. However, the middle range rating about doctors providing advice about the benefits of the Pap test suggested that there could be more discussions

about the importance of the Pap test between healthcare providers and Spanish-speaking patients, since this is a major predictor for being up-to-date with Pap tests [8]. Participants reported that spouses, doctors and *promotoras* provided more information regarding preventive care than sources of information from TV, newspapers, or the internet, showing the importance of interpersonal communication on disease prevention in this population group.

Based on the literature on screening rates in low-income immigrant communities, the researchers had assumed that it would not be difficult to find and recruit women who were not up-to-date with their Pap test [28]. In this study, 441 women were contacted to identify 90 women who would soon not be up-to-date with their cervical cancer screening. The 2 years gap in screening was used instead of 3 years as the inclusion criteria because of the difficulty in locating women who would qualify for the study, which was identified as a problem in our pilot survey study [20]. However, during the *charlas*, the *promotora* told participants they should receive a Pap test every 3 years. Challenges in recruiting eligible women may be interpreted as a positive finding that less than 20% of women in our initial recruitment pool were not up-to-date with their Pap tests. However, the small study sample limits conclusions about intervention efficacy. Moreover, there were positive findings from women's experiences in the healthcare facilities where they received their Pap tests, which were primarily health departments or community health centers. While language translation in the facilities remains a challenge in some cases, the majority of study participants reported that translation assistance was available, or they brought their own translators.

Strengths and limitations of this study should be considered. The most important strength was the inclusion of cultural considerations in the study design and methodology. Study limitations included the small sample size, the assignment of intervention and control site based on county rather than random assignment, changing screening interval recommendations communicated to study participants from health departments during the course of the study, and literacy issues that emerged during survey administration. Overall these limitations might limit the generalizability of the study results and introduced sampling error. Thus, our results should be considered as suggestive and not conclusive. Future research on the effectiveness of group interventions to increase cervical cancer screening in this priority population is warranted.

Conclusion

The *Salud es Vida promotora* intervention was effective in increasing knowledge about cervical cancer and the Pap test among Latina farmworker women. Moreover, there was a significant increase in underscreened women seeking screening following the intervention, but the result was not statistically significant because of increased adherence which also occurred in the control group, either because of potential contamination from the intervention county or the effect on control participants of completing a survey containing many questions about cervical cancer and therefore considering screening. Future research should involve multiple sites on the East Coast migrant stream using a larger sample of women to test the effectiveness of the group intervention approach to increase Pap test adherence among rural Hispanic/Latina women in farmworker settings.

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Table 1

Demographic Characteristics of Participants by Study Arm

Characteristic	Intervention Group (N=38)	Control Group (N=52)	Total (N=90)
Mean age (SD, range)	40 (8.95, 22 – 59)	39 (8.00, 22 – 62)	39 (8.41, 22 – 62)
Years of schooling (SD, range)	8 (4.21, 0 – 16)	9 (4.71, 0 – 20)	9 (4.50, 0 – 20)
Years in U.S. (SD, range)	14 (5.74, 3 – 24)	13 (6.32, 1 – 38)	13 (6.06, 1 – 38)
Median income category/week	$250–$500	$250–$500	$250–$500
Score on ASMA acculturation scale (range, 0 = low to 4 = high)	0.78 (0 – 2)	0.71 (0 – 1)	0.74 (0 – 2)
Marital status			
Single/Other	10 (27%)	10 (19%)	20 (22%)
Married/living with a partner	27 (73%)	42 (81%)	69 (78%)
Is currently employed	25 (68%)	34 (65%)	59 (66%)
Have health insurance	0	2 (4%)	2 (2%)
Have a regular health care provider	20 (54%)	17 (33%)	37 (42%)
Have ever received a Pap test	36 (95%)	48 (94%)	84 (94%)
Country of Origin			
Mexico	36 (95%)	50 (96%)	86 (96%)
Other Latin American country	2 (5%)	2 (4%)	4 (4%)
Residence			
Rent or Other	22 (58%)	31 (60%)	53 (59%)
Own	16 (42%)	21 (40%)	37 (41%)
Time to get next Pap test (baseline)			
1 year or less	28 (74%)	38 (73%)	66 (73%)
>1 year but <3 years	0	3 (6%)	3 (3%)
>3 years but <5 years	0	1 (2%)	1 (1%)
>5 years	0	0	0
Don’t know	10 (26%)	10 (19%)	20 (22%)
Time to get next Pap test (follow-up)			
1 year or less	17 (50%)	30 (58%)	47 (55%)
>1 year but <3 years	13 (38%)	17 (33%)	30 (35%)
>3 years but <5 years	1 (3%)	1 (2%)	2 (2%)
>5 years	0	1 (2%)	1 (1%)
Don’t know	3 (9%)	3 (6%)	6 (7%)

Notes: Columns are in mean values (standard deviations, ranges) for continuous variables and frequencies (percentages) for categorical variables. The ASMA instrument was used to measure acculturation [9]. No significant differences were found between groups at $p < 0.05$. Missing values are not included in count data.

Table 2

Baseline Cervical Cancer Beliefs and Sources of Health Information

Characteristic	Study Participants (N=90)
Likelihood of getting cervical cancer in my lifetime	3.0 (1.1)
My whole life would change if got cervical cancer	3.8 (1.2)
A Pap test is the best way to find cervical cancer early	4.4 (1.0)
I need a Pap test only when I experience vaginal bleeding	2.0 (1.3)
I have seen a family member suffer from cancer	2.4 (1.4)
I know a lot of people who have had Pap tests in the past year	2.8 (1.3)
My spouse encourages me to be up-to-date with prevention	3.7 (1.2)
People I care about tell me to get the medical care I need	3.4 (1.4)
A doctor has given me advice about the benefits of Pap tests	3.5 (1.4)
Cervical cancer is curable if detected early by a Pap test	4.2 (1.0)
Getting Pap tests would decrease my worry about cervical cancer	4.3 (1.0)
I rely on TV for health information	2.4 (1.3)
I rely on newspapers for health information	1.9 (1.1)
I use the internet for health information	2.7 (1.4)
A *promotora* has told me about the health benefits of the Pap test	2.8 (1.4)
I have a method to remember when my next checkup will be	3.4 (1.3)

Notes: Columns are in mean values (standard deviations) for continuous variables. Scale response categories are as follows: 1 = “strongly disagree”; 2 = “disagree”; 3 = “neutral”; 4 = “agree”; 5 = “strongly agree”.

Table 3

Changes in Outcome Variables by Study Arm

Characteristic	Intervention Group (N=38)	Control Group (N=52)	p value
Received a Pap test at follow-up	12 (32%)	10 (19%)	.178
Cervical Cancer Knowledge			
Total Baseline Pretest Score	10.1 (1.4)	10.7 (1.4)	.065
Total Baseline Posttest Score	12.5 (1.9)	10.4 (1.7)	.001*
Total Follow-up Score	11.5 (2.1)	10.7 (1.7)	.033*
Cervical Cancer Screening Self-Efficacy Scale			
Total Baseline Items	39.6 (8.7)	39.8 (7.3)	.895
Total Follow-up Items	44.2 (7.3)	42.5 (6.9)	.275
Cervical Cancer Screening Self-Efficacy Scale (baseline)			
You can discuss having a Pap with your doctor	3.1 (1.6)	3.2 (1.4)	.832
You can schedule a Pap test appointment and keep it	3.8 (1.3)	3.9 (1.1)	.615
You can keep having a Pap test even if you had to go to a different clinic	3.3 (1.5)	3.4 (1.3)	.778
You can ask for a Pap test	3.9 (1.2)	4.0 (1.1)	.620
You can get your next Pap test	4.2 (0.9)	3.9 (1.3)	.241
You can get a Pap test even if you are worried that it will be painful	4.2 (1.1)	4.0 (1.1)	.476
You can get a Pap test if you are worried that your partner would not want you to get it	4.3 (0.9)	4.1 (1.1)	.365
You can get a Pap test even if your friend discourages you	4.5 (0.7)	4.4 (1.0)	.568
You can get a Pap test even if you had to pay for it	4.0 (1.0)	4.2 (1.0)	.360
You can get a Pap test even if you feel embarrassed	4.1 (1.1)	4.2 (0.9)	.707
Cervical Cancer Screening Self-Efficacy Scale (follow-up)			
You can discuss having a Pap with your doctor	4.4 (0.9)	4.1 (1.0)	.073
You can schedule a Pap test appointment and keep it	4.5 (0.8)	4.3 (1.0)	.227
You can keep having a Pap test even if you had to go to a different clinic	3.8 (1.3)	3.6 (1.3)	.356
You can ask for a Pap test	4.5 (0.7)	4.1 (1.1)	.056
You can get your next Pap test	4.5 (0.9)	4.3 (1.0)	.399
You can get a Pap test even if you are worried that it will be painful	4.5 (0.9)	4.4 (0.9)	.565
You can get a Pap test if you are worried that your partner would not want you to get it	4.6 (0.8)	4.5 (0.9)	.635
You can get a Pap test even if your friend discourages you	4.6 (0.8)	4.6 (0.9)	.923
You can get a Pap test even if you had to pay for it	4.3 (1.1)	4.4 (1.0)	.607
You can get a Pap test even if you feel embarrassed	4.5 (1.0)	4.4 (0.9)	.555

Notes: Columns are in mean values (standard deviations) for continuous variables and frequencies (percentages) for categorical variables. Missing values are not included in count data. Cervical cancer knowledge was assessed using a True/False, multiple choice instrument for a maximum score of 15. The cervical cancer screening self-efficacy scale has 10 items scored on a 5-item Likert-type scale for a maximum score of 50.

* $p < 0.05$

Table 4

Pretest-Posttest Knowledge Responses by Item

Question (correct response) – Intervention Group (N=38)	**Incorrect to Correct n (%)**	**Correct to Correct n (%)**	**Incorrect to Incorrect n (%)**	**Correct to Incorrect n (%)**	**p value**
Cervical cancer begins in vagina (False)	7 (18.4%)	3 (7.9%)	24 (63.2%)	4 (10.5%)	.549
Regular Pap tests prevent cervical cancer (True)	0	38 (100%)	0	0	-
Abnormal Pap tests always mean cervical cancer (False)	4 (10.5%)	25 (65.8%)	7 (18.4%)	2 (5.3%)	.688
HPV vaccine means no more regular Pap test (False)	3 (7.9%)	24 (63.2%)	4 (10.5%)	7 (18.4%)	.344
After the Pap test you can return to work (True)	1 (2.6%)	37 (97.4%)	0	0	-
Cervical cancer is preventable (True)	0	38 (100%)	0	0	-
You can have sex the day of the Pap test (False)	19 (50%)	16 (42.1%)	1 (2.6%)	2 (5.3%)	.001*
HPV can cause the Pap test to be abnormal (True)	13 (34.2%)	23 (60.5%)	1 (2.6%)	1 (2.6%)	.002*
When cervical cancer begins there are no symptoms (True)	12 (31.6%)	18 (47.4%)	6 (15.8%)	2 (5.3%)	.013*
A healthy body can fight HPV on its own (True)	24 (63.2%)	9 (23.7%)	5 (13.2%)	0	.001*
What is the primary cause of cervical cancer? (HPV)	5 (13.2%)	20 (52.6%)	10 (26.3%)	3 (7.9%)	.727
What test is used for cervical cancer screening? (Pap test)	1 (2.6%)	33 (86.8%)	2 (5.3%)	2 (5.3%)	1.00
How is HPV transmitted? (Through sexual relations)	2 (5.3%)	35 (92.1%)	0	1 (2.6%)	1.00
Pap tests are … (Safe)	5 (13.2%)	30 (78.9%)	2 (5.3%)	1 (2.6%)	.219
When should a woman begin getting the Pap test? (After 21 yrs. old or 3 yrs. after having sexual relations)	18 (47.4%)	11 (28.9%)	9 (23.7%)	0	.001*
Question (correct response) – Control Group (N=52)					
Cervical cancer begins in vagina (False)	6 (11.5%)	10 (19.2%)	28 (53.8%)	8 (15.4%)	.791
Regular Pap tests prevent cervical cancer (True)	1 (1.9%)	50 (96.2%)	0	1 (1.9%)	1.00
Abnormal Pap tests always mean cervical cancer (False)	7 (13.5%)	30 (57.7%)	9 (17.3%)	6 (11.5%)	1.00
HPV vaccine means no more regular Pap test (False)	5 (9.6%)	42 (80.8%)	1 (1.9%)	4 (7.7%)	1.00
After the Pap test you can return to work (True)	1 (1.9%)	48 (92.3%)	2 (3.8%)	1 (1.9%)	1.00
Cervical cancer is preventable (True)	1 (1.9%)	51 (98.1%)	0	0	-
You can have sex the day of the Pap test (False)	3 (5.8%)	31 (59.6%)	11 (21.2%)	7 (13.5%)	.344
HPV can cause the Pap test to be abnormal (True)	5 (9.6%)	31 (59.6%)	9 (17.3%)	7 (13.5%)	.774
When cervical cancer begins there are no symptoms (True)	6 (11.5%)	23 (44.2%)	10 (19.2%)	13 (25.9%)	.167

Question (correct response) – Intervention Group (N=38)	Incorrect to Correct n (%)	Correct to Correct n (%)	Incorrect to Incorrect n (%)	Correct to Incorrect n (%)	p value
A healthy body can fight HPV on its own (True)	12 (23.1%)	9 (17.3%)	25 (48.1%)	6 (11.5%)	.238
What is the primary cause of cervical cancer? (HPV)	4 (7.7%)	30 (57.7%)	14 (26.9%)	4 (7.7%)	1.00
What test is used for cervical cancer screening? (Pap test)	3 (5.8%)	41 (78.8%)	3 (5.8%)	5 (9.6%)	.727
How is HPV transmitted? (Through sexual relations)	0	39 (75%)	7 (13.5%)	6 (11.5%)	.031 *
Pap tests are … (Safe)	3 (5.8%)	36 (69.2%)	8 (15.4%)	5 (9.6%)	.727
When should a woman begin getting the Pap test? (After 21 yrs. old or 3 yrs. after having sexual relations)	0	12 (23.1%)	40 (76.9%)	0	1.00

Notes: Incorrect to correct = item answered incorrectly at pretest and correctly at posttest. Correct to correct = item answered correctly at pretest and posttest. Incorrect to incorrect = item answered incorrectly at pretest and posttest. Correct to incorrect = item answered correctly at pretest and incorrectly at posttest.

* $p < 0.05$