

A QUASI-EXPERIMENTAL EVALUATION OF A COMMUNITY-BASED HIV PREVENTION INTERVENTION FOR MEXICAN AMERICAN FEMALE ADOLESCENTS: THE SHERO'S PROGRAM

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This article describes a quasi-experimental evaluation of a community-based, culturally and ecologically tailored HIV prevention intervention for Mexican American female adolescents grounded in the AIDS risk reduction model. A total of 378 Mexican American female adolescents (mean age = 15.2) participated in either the nine-session SHERO's (a female-gendered version of the word *hero*) intervention or a single session information-only HIV prevention intervention. Assessment data were collected at pretest, posttest, and 2-month follow up. Significant improvements across all time points were revealed on measures of self-esteem, condom attitudes, beliefs regarding a woman's control of her sexuality, beliefs regarding sexual assault, perceived peer norms, and HIV/AIDS and STI knowledge. At posttest SHERO's participants were more likely to carry condoms and to report abstaining from vaginal sex in the previous 2 months; and at 2-month follow up they reported using condoms more often in the preceding 2 months and planned on using them more frequently in the coming 2 months. Findings support the development of community-based adolescent HIV prevention interventions that address culturally specific ecological factors.

Sexually transmitted infections (STIs), including HIV, continue to threaten the health of Latinas in the United States. Rates for chlamydia were three times higher and rates for primary and secondary syphilis were nearly two times higher among Latina females than Whites (Centers for Disease Control and Prevention [CDC], 2007). In 2006, Latinas made up 11% of the U.S. female population but accounted for 15% of females living with HIV/

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Funding for this research was provided by the AIDS Foundation of Chicago, Chicago Department of Public Health, Illinois Campus Compact for Community Service, and the DePaul University Research Council.

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AIDS (CDC, 2008a). Latina women also represented 24% of new HIV infections among all Latinos, but their rate of HIV infection was nearly four times the rate among White women (CDC, 2008b). The HIV/STI risks of young Latinas are underscored by the 2007 U.S. Youth Risk Behavior Survey, with this group reporting the lowest rates of condom use during last sexual intercourse (52.1%), as compared with sexually active 9th-12th-grade female and male students of other ethnicities (CDC, 2008c).

Earlier studies have emphasized the salience of cultural nuances and unique contextual challenges to HIV/STI-related behaviors, such as immigration, acculturation, and citizenship status (Afable-Munsuz, & Brindis, 2006; Espinoza, Hall, Selik, & Hu, 2008; Lopez-Quintero, Shtarkshall, & Neumark, 2005; Loue et al., 2004; Zambrana, Cornelius, Boykin & Lopez, 2004). Comparisons of Latino subgroups living in the United States also demonstrated lower levels of HIV-related education and knowledge, rates of HIV testing, and perceived risk of HIV among Mexicans and Mexican Americans (Lopez-Quintero et al., 2005; Loue, Copper & Fieldler, 2003; Loue, Cooper, Traore, & Fiedler, 2004; Zambrana et al., 2004). In the United States, women of Mexican origin constitute the largest Latina subgroup (54.3%), yet a dearth of culturally specific research and interventions exist (American College of Physicians, 2000; Harvey et al., 2004; Herbst et al., 2007). In Herbst et al.'s (2007) recent review and meta-analysis of 20 Latino-focused HIV behavioral interventions, only three exclusively involved adolescents, one of which focused on young females (Koniak-Griffin, Lesser, Nyamathi, Uman, Stein, & Cumberland, 2003). The other two interventions included mixed gender samples of adolescents who were predominately Puerto Rican (94% for Sellers, McGraw, & McKinley, 1994; 85.4% for Villarruel, Jemmott, & Jemmott, 2006).

Recent randomized controlled trials investigated the ability of one session clinic-based interventions to reduce the risk of HIV/STIs among African American and Latina female adolescents (Jemmott, Jemmott, Braverman, & Fong, 2005; Roye, Silverman, & Krauss, 2007). However, these interventions may have limited utility for Mexican and Mexican American female adolescents who may be reluctant to seek services at a health care facility if they fear that their personal or family members' citizenship status may be questioned by clinic staff. Instead, multiple session interventions may offer more time to address the sociocultural factors that impact risk/protection and to enhance the adoption of risk reduction skills. Several systematic reviews of adolescent-focused HIV prevention interventions have in fact demonstrated that multiple sessions increase overall program effectiveness and sustainability (cf., Kirby, Laris, & Rolleri, 2006; Robin et al., 2004; Rotheram-Borus, O'Keefe, Kracker, & Foo, 2000). Among Latinos, Herbst et al.'s (2007) review concluded that interventions with four or more sessions demonstrated greater efficacy in reducing sexual risks.

Two recent randomized controlled trials with mixed-gender samples of young Latinos (Prado et al., 2007; Villarruel et al., 2006) showed significant increases in behavioral outcomes among intervention participants. However, in spite of these encouraging results, mixed-gender HIV prevention interventions may not effectively address the cultural factors and gender-related power imbalances that impact Mexican American female adolescents (Gomez & Marin, 1996; Harvey, Beckman, & Bird, 2003; Loue et al., 2004; Marin, 2003). To increase comfort in discussing sex-related topics single-gender HIV prevention interventions have been conducted with ethnic minority female adolescents (Dolcini, Harper, Boyer, Watson, Pollack, & Chang, 2008; Morrison et al., 2007). Herbst et al.'s (2007) review also revealed significant reductions in the odds of any sexual risk behavior only among single-gender intervention groups.

It is imperative that HIV prevention interventions address the broad range of gender- and culture-specific psychosocial and ecological factors that may influence HIV risk

and protection for Mexican American female adolescents (cf., DiClemente et al., 2008; Kotchick, Shaffer, & Forehand, 2001; Pantin, Schwartz, Sullivan, Prado, & Szapocknik, 2004). However, research that determines the effectiveness or efficacy of an intervention specifically designed for this population does not currently exist. The current study helps close this knowledge gap by testing the effectiveness of a community-based culturally and ecologically tailored HIV prevention intervention. A community-based participatory research (CBPR) framework was used throughout the study in order to increase the intervention's relevance to the population and community setting where it was delivered. We hypothesized that intervention participants would demonstrate increases in several sexual health promoting outcomes, including psychosocial attitudes and beliefs, and behaviors, postintervention and at the 2-month follow-up period.

METHODS

PARTICIPANTS

Three hundred seventy-eight Mexican American female adolescents aged 12-21 years (mean = 15.2; mode = 16) were recruited from community-based social venues in two low-income urban neighborhoods in a large U.S. midwestern city. Participants in the comprehensive cultural/ecological intervention ($n = 181$ at baseline; mean age = 15.31, standard deviation [SD] = 1.54) and brief comparison intervention ($n = 197$ at baseline; mean age = 15.24, SD = 1.66) conditions were similar on all sociodemographic characteristics measured (i.e., socioeconomic status, age, job status, grade, acculturation status; $p > .05$ for each). The majority (76.7%) of the young women in the comprehensive intervention attended at least seven of the nine total sessions, with 18.9% attending six sessions and 4.4% attending five or fewer sessions.

To be eligible for this study, participants must have (a) been female, (b) self-identified as Mexican or Mexican American, c) been between 12 to 21 years of age, (d) lived in either neighborhood where data collection took place, and (e) self-identified as a bilingual (Spanish and English) or monolingual English speaker. Because the community-based organization (CBO) that collaborated on this study had a strong desire to provide primary prevention and sexual health promotion services to a range of Mexican American young women in the communities being served, sexually active and inactive youth participated in both interventions. Intervention funding requirements mandated that the programs be open to youth between the ages of 12 and 21, although 94% of participants were between the ages of 12-17. Owing to financial constraints, the CBO only provided its HIV prevention programs for female adolescents in English. Moreover, given the age of the potential participants and their involvement in the school system, most of the youth approached for participation were either bilingual or monolingual English speakers.

Participants in both conditions resided in comparable urban neighborhoods as reflected by their ethnic composition (comprehensive: 83% Latino; brief: 88.9% Latino) and socioeconomic status (comprehensive: 26.5% of households below poverty level; brief: 27% below poverty level) (Chicago Department of Public Health, 2006a, 2006b; Shah, Whitman, & Silva, 2006). Furthermore, there were similar rates in both neighborhoods of HIV-related deaths (1.9% and 1.3%) and teen births (14.9% and 13.6%) (Chicago Department of Public Health, 2006, 2006b). Both neighborhoods were geographically adjacent but separated by gang territory lines, such that youth from one neighborhood did not typically socialize with those from the other (regardless of gang affiliation); thus decreasing the likelihood of intervention contamination.

INTERVENTIONS

The comprehensive culturally and ecologically tailored intervention detailed here is known as the SHERO's program (a female-gendered version of the word *hero*). This nine-session interactive group-based HIV prevention intervention is theoretically based in the AIDS risk reduction model (ARRM; Catania, Kegeles, & Coates, 1990). The ARRM is a stage model that provides insights into HIV risk reduction behavior change processes and offers recommendations for how to move people through the process of behavior change (Catania et al., 1990). The ARRM consists of the following three primary stages: (a) *labeling* (recognizing and labeling one's behavior as high risk), b) *commitment* (making a commitment to reduce high-risk sexual behaviors and to increase low-risk activities), and (c) *enactment* (seeking information, obtaining remedies and enacting solutions [three phases]). Although the ARRM consists of three sequential stages, individuals do not always pass through these stages (and the three phases of the *enactment* stage) in a unidirectional and irreversible manner (Catania et al., 1990).

The SHERO's intervention was developed collaboratively among a Latino-focused CBO, university-based researchers/evaluators, and Mexican American adolescent females from the local community, utilizing CBPR and empowerment evaluation approaches (Harper, Bangi, Contreras, Pedraza, Tolliver, & Vess, 2004; Harper, Contreras, Bangi, & Pedraza, 2003). Narrative ethnographic methods were also used to reveal the community and cultural narratives that served both as barriers to sexual self-protection and facilitators of sexual health among Mexican American young women (Harper, Lardon, et al., 2004).

The intervention included strategies used in prior efficacious interventions, including the provision of HIV transmission/prevention information and the teaching/practice of HIV risk reduction skills (e.g., condom negotiation, refusal of sex, condom use) through interactive games, group discussion, role-plays, and mini-lectures. Sessions also focused on salient issues that impact the sexual health of Mexican American adolescents in the community (e.g., cultural pressures/desires to be a mother, sexual relationships with older men, and gang affiliation) and challenged gender-based inequalities and double standards (e.g., *machismo/marianismo*, power dynamics in sexual relationships, intimate partner violence). The intervention was delivered in groups of 15 to 20 participants at the CBO. Each 2-hour session was cofacilitated by a young Mexican American female CBO staff member from the community (primary facilitator) along with other young women of color from local organizations (e.g., public health clinic, academic institution, CBOs). Bus tokens and snacks were provided to participants at every session, and youth received various incentives (e.g., skin care/beauty products) based on attendance. More specific details of the intervention sessions have been previously described (Harper, Bangi, Sanchez, Doll, & Pedraza, 2006; Harper, Bangi, et al., 2004; Harper et al., 2003; Harper, Lardon, et al., 2004).

The brief comparison condition consisted of a single 2-hour information-based HIV/AIDS prevention session. This session was held at a private room in a local library and was facilitated by a young female CBO staff member indigenous to the neighborhood. Groups of 15 to 20 young women each received information based on a standard sexual risk reduction curriculum used by the CBO in their city department of public health funded school-based HIV prevention program. Bus tokens, snacks, and incentives were provided to these participants.

The decision to use a quasi-experimental design was influenced by logistical limitations in the CBO setting, and feedback from youth who participated in the SHERO's intervention development. These young women cautioned that attendance at sessions would decline if youth were not able to attend groups with their friends. Posttest data supported this notion, as 64% of participants indicated that they "always" came to the group ses-

sions with their friends. The issue of friends also raised methodological concerns because friends in a single neighborhood who were assigned to different conditions might share information owing to close and extended social networks in the study neighborhoods, resulting in contamination. The decision to offer a brief comparison intervention rather than a no-treatment control was made in order to provide some level of service to youth in both communities given the need for sexual health interventions.

DATA COLLECTION

Convenience samples of participants were recruited through street and community agency outreach by female CBO staff members indigenous to the two neighborhoods. Outreach was conducted at socializing venues such as parks, shopping areas, and cultural events. All study procedures were conducted in English. Data were collected at pre-intervention, immediately postintervention (occurred in accordance with the end of the 9-week SHERO's program for both conditions), and at 2-month follow-up. All participants completed paper-and-pencil questionnaires and received \$15 for each questionnaire. In an effort to minimize attrition, participants received phone and mail reminders regarding intervention and assessments sessions, and public transportation passes were provided. Of the total sample, 75% completed the posttest and 71% completed the 2-month follow-up; 270 youth completed measures at all points.

Overall retention from baseline was lower in the comprehensive condition (postintervention $n = 115$ [62.8%], 2-month follow-up $n = 110$ [60.1%]) than in the one session comparison condition (postintervention $n = 170$ [85.4%], 2-month follow up $n = 161$ [80.9%]). Pearson chi-square results were significant in comparing the percentage of participants lost to follow-up at posttest, $\chi^2 (1, n = 199) = 99.91, p < .05$ and at 2-month follow up, $\chi^2 (1, n = 199) = 76.03, p < .05$, by condition. However, those lost to follow-up at posttest and 2-month follow-up were similar on all sociodemographic variables measured (i.e., socioeconomic status, age, job status, grade, acculturation status; $p > .05$ for each). It is noteworthy that 95.7% of participants who completed the posttest in the comprehensive condition were retained at the 2-month follow-up.

PSYCHOSOCIAL OUTCOME MEASURES

The psychosocial measures were selected based on the ARRM (Catania et al., 1990), the cultural/ecological factors included in the interventions, and a review of the empirical literature. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Ten items were rated on a 4-point Likert scale ranging from "strongly agree" (1) to "strongly disagree" (4). Possible total scores ranged from 10 to 40, with higher total scores reflecting greater positive self-esteem. For the present study, a test of internal consistency produced a Cronbach's alpha of .37 at pretest. Nineteen true-false items measured HIV/AIDS knowledge and were adapted from previous scales (Carey, Morrison-Beedy, & Johnson, 1997) ($\alpha = .59$ at pretest). Items were summed to obtain a total HIV/AIDS knowledge score. Possible scores ranged from 0 to 19, with higher scores on this measure indicating more accurate knowledge about HIV and AIDS. Seven true-false items measured STI knowledge regarding the transmission and consequences of STIs ($\alpha = .65$ at pretest). Items were summed to get a total STI knowledge score. Possible scores ranged from 0 to 7, with higher scores indicating more accurate knowledge about STIs. Nineteen items from the Condom Attitudes Scale (Sacco, Levine, Reed, & Thompson, 1991; St. Lawrence et al., 1994) measured condom attitudes related to the perceived barriers and facilitators to condom use ($\alpha = .74$ at pretest). Items were rated on a 4-point Likert scale ranging from "strongly agree" (1) to "strongly disagree" (4). Possible total scores ranged from 19 to 76, with higher scores indicating more positive attitudes towards condoms and

condom use. Ten items were taken from an HIV-related peer norms measure developed for urban youth of color (Catania & Dolcini, 2006) to assess perceived peer norms regarding condoms and sexual relationships that are supportive of HIV protective behaviors ($\alpha = .76$ at pretest). Possible total scores ranged from 10 to 40, with higher scores indicating more positive peer norms about condoms and sexual relationships. A four-item subscale from the Sexual Beliefs Scale (Muehlenhard & Felts, 1998)—the Token Refusal (TR) subscale—measured the belief that women often indicate an unwillingness to engage in sex when they are actually willing ($\alpha = .70$ at pretest). Total scores ranged from 4 to 16. From the same scale (Muehlenhard & Felts, 1998), another four-item subscale (Leading on Justifies Force, LOJF) measured the belief that if a woman leads a man on, behaving as if she is willing to engage in sex when in fact she is not, then the man is justified in forcing her to have sex with him ($\alpha = .78$ at pretest). Total scores ranged from 4 to 16. The Sexual Beliefs Scale was designed to measure distinct sexual beliefs that are related to sexual coercion and rape, with higher scores on the two subscales indicating individual belief systems regarding heterosexual sexual interactions that are more permissive of sexually coercive behavior by partners (Muehlenhard & Hollabaugh, 1988; Muehlenhard & MacNaughton, 1988). In other words, lower scores on the TR and LOJF subscales indicate more desirable outcomes. Seven items from the Health Protective Sexual Communication Scale (Catania, 1998) measured sexual communication (beliefs regarding a participant's ability to talk with a sexual partner about health protective concerns; $\alpha = .74$ at pretest). Total scores ranged from 0 to 7. Higher total scores denoted greater perceived ability to communicate with a sexual partner about health protective concerns. Five items measured sexual assertiveness in sexual situations ($\alpha = .77$ at pretest) and were taken from Kirby's (1998) Behavior Inventory. Total scores ranged from 5 to 25. Higher total scores on this measure indicated greater perceived ability to be assertive in sexual situations. Five items measured sexual decision making ($\alpha = .73$ at pretest) and also comprised a subscale taken from Kirby's (1998) Behavior Inventory. Total scores ranged from 5 to 25. Higher total scores indicated greater frequency with which decision-making skills were used in sexual situations.

BEHAVIORAL OUTCOME MEASURES

Sexual risk/protective behaviors were assessed by participants' self-reports of vaginal sex-related behaviors in the 2 months preceding assessment, including the number of times condoms were used and the number of different vaginal sex partners. Additionally, a single item using a 4-point Likert scale assessed the frequency with which participants carried condoms. Participants' plans to use condoms during vaginal sex in the next 2 months following the assessment were measured on a 7-point Likert scale, with 1 representing "every time" and 7 representing "never." This item also included a response of "I don't plan on having sex in the next 2 months," which was used to classify participants who planned on abstaining from sexual activity in the next 2 months.

RESULTS

PSYCHOSOCIAL OUTCOMES

Using an "intent to treat" framework, all participants who completed postintervention measures were included in the analyses regardless of how many sessions they attended. A series of 3 (Time) x 2 (Group) repeated measures, mixed-model analyses of variance (ANOVAs) procedures were conducted to examine the effect of the intervention over time on psychosocial measures. In each of these analyses, the SHERO's intervention (referred to in this section as "intervention") and brief comparison intervention (referred to in this

TABLE 1. Psychosocial Outcome Scores Pretest, Posttest, and 2-Month Follow-Up and Results of Repeated-Measures, Mixed Model ANOVA Test

Psychosocial Outcomes	Time Point	Intervention Mean (SD)	Comparison Mean (SD)	ANOVA (Group x Time)**
Self-Esteem		<i>n</i> = 115	<i>n</i> = 156	$F(2,538) = 84.48$
	Pretest	22.66 (2.98)	23.04 (2.94)	
	Posttest	30.42 (5.46)	23.40 (2.97)	
	2-month follow-up	29.19 (7.80)	23.35 (2.29)	
Perceived peer norms		<i>n</i> = 115	<i>n</i> = 153	$F(2,532) = 62.65$
	Pretest	26.69 (2.98)	26.15 (2.95)	
	Posttest	33.98 (4.12)	26.53 (2.84)	
	2-month follow-up	31.84 (8.03)	26.24 (3.02)	
Sexual communication		<i>n</i> = 112	<i>n</i> = 148	$F(2,516) = 11.73$
	Pretest	5.87 (1.61)	6.22 (1.43)	
	Posttest	6.46 (1.39)	7.91 (1.64)	
	2-month follow-up	6.21 (1.77)	7.58 (1.22)	
Condom attitudes		<i>n</i> = 115	<i>n</i> = 156	$F(2,494) = 67.44$
	Pretest	54.59 (6.13)	54.92 (7.13)	
	Posttest	61.44 (6.96)	48.78 (5.55)	
	2-month follow-up	56.90 (13.85)	49.02 (5.70)	
Leading on justifies force		<i>n</i> = 114	<i>n</i> = 135	$F(2,462) = 120.11$
	Pretest	10.84 (2.67)	11.78 (2.29)	
	Posttest	6.13 (1.97)	12.14 (3.36)	
	2-month follow-up	5.88 (2.08)	12.17 (3.52)	
Token refusal of sex		<i>n</i> = 76	<i>n</i> = 157	$F(2,482) = 114.12$
	Pretest	10.43 (2.56)	11.50 (2.68)	
	Posttest	6.43 (2.12)	11.87 (2.90)	
	2-month follow-up	6.34 (2.04)	12.42 (2.99)	
HIV/AIDS knowledge		<i>n</i> = 86	<i>n</i> = 157	$F(2,494) = 6.50$
	Pretest	13.70 (2.97)	13.98 (3.58)	
	Posttest	16.15 (2.62)	14.93 (2.86)	
	2-month follow-up	15.30 (4.41)	14.96 (2.97)	
STI knowledge		<i>n</i> = 114	<i>n</i> = 135	$F(2,530) = 37.88$
	Pretest	3.98 (1.88)	4.17 (1.86)	
	Posttest	5.51 (1.54)	3.97 (1.80)	
	2-month follow-up	5.12 (1.71)	4.03 (1.99)	

Note. ANOVA = analysis of variance; STI = sexually transmitted infection. ** $p < .01$.

section as “comparison”) groups served as the between-group variable and time served as the within-group variable. Table 1 displays the descriptive statistics of the significant interaction effects for the psychosocial measures. The interaction of the group by time indicates that the intervention and comparison group differed in the changes over time in the outcome variable. There were no significant intervention effects on sexual assertiveness and sexual decisionmaking.

Regarding *self-esteem*, there was a significant interaction effect, $F(2, 538) = 84.48$, $p < .01$, $h_p^2 = .24$, with improvements over time for intervention group participants and

similar levels over time for those in the comparison group. Although participants in the comparison group reported higher levels of self-esteem at baseline, intervention group participants reported higher levels of self-esteem at posttest and 2month follow-up at each time point.

The intervention also had a positive influence on *condom attitudes*. The significant interaction, $F(2, 494) = 67.44, p < .01, h_p^2 = .21$, reveals that condom attitudes improved for participants in the intervention but decreased for their counterparts. Although participants in the comparison group reported slightly more positive condom attitudes at baseline and 2-month follow-up, intervention group participants reported more positive condom attitudes at posttest. Similarly, *perceived peer norms* were impacted by the intervention. The significant interaction, $F(2, 532) = 62.65, p < .01, h_p^2 = .19$, reveals that perceived peer norm scores increased for intervention participants, indicating an increased belief that their peers are supportive of sexual health protective behaviors. Sexual communication also produced significant results. The significant interaction, $F(2, 516) = 11.73, p < .01, h_p^2 = .04$, showed that comparison group participants reported a greater ability to talk about health protective concerns with a sexual partner than those in the intervention group.

Regarding beliefs that a woman *leading a man on justifies force*, there was a significant interaction, $F(2, 462) = 120.11, p < .01, h_p^2 = .34$, such that intervention participants' scores decreased over time (indicating decreased endorsement of the belief that if a woman leads a man on then the man is justified in forcing her to have sex with him). Similarly, *regarding token refusal of sex*, a significant interaction, $F(2, 482) = 114.12, p < .01, h_p^2 = .32$, revealed that the belief that women often indicate an unwillingness to engage in sex when they are actually willing decreased over time. Scores on both of these scales remained relatively the same for comparison group participants.

Another significant interaction, $F(2, 494) = 6.50, p < .01, h_p^2 = .03$, reveals that the *HIV/AIDS knowledge* scores improved more for participants in the intervention. They reported greater HIV/AIDS knowledge at posttest and 2-month follow-up than those in the comparison group. An additional significant interaction, $F(2, 530) = 37.88, p < .01, h_p^2 = .13$, reveals that STI knowledge increased for intervention participants. Although participants in the comparison group reported greater STI knowledge at baseline, intervention group participants reported greater STI knowledge at posttest and 2-month follow-up.

BEHAVIORAL OUTCOMES

Table 2 illustrates the frequency with which participants engaged in sexual risk/protective behaviors across all time points. A minority of participants were actively engaging in sexual behaviors. Pearson chi-squares were conducted to compare the sexually active participants on whether or not they had vaginal sex during the previous 2 months at posttest and at the 2-month follow-up. There was a marginally significant result at posttest with intervention participants less likely to report having had vaginal sex ($n = 18; 16\%$) compared with comparison participants ($n = 43; 26\%$), $\chi^2 (1, n = 270) = 3.81, p = .05$. There was no significant difference between the two groups at 2-month follow-up in whether or not they had vaginal sex during the previous 2 months, $\chi^2 (1, n = 269) = .02, ns$.

Analysis of covariance (ANCOVA) procedures were conducted on several behavioral outcomes (Table 3). We controlled for the behavioral measure at baseline and only included sexually active participants in the analyses. Repeated measures analyses could not be conducted because of the small sample sizes. Analyses revealed that at posttest intervention participants were more likely to carry condoms during the previous 2 months, $F(1,42) = 13.36, p < .01$. At the 2-month follow-up, there was no difference between the two groups on condom carrying, $F(1,42) = .00, ns$. Another ANCOVA illustrated that for all participants who planned on having sex, there was no group difference in the frequency

TABLE 2. Frequencies and percentages of behavioral outcomes at each time point for the intervention and comparison groups

Behavioral outcome	Time Point	Intervention n (%)	Comparison n (%)
Ever had vaginal sex	Pretest	Yes = 60(33%) No = 123(67%) <i>n</i> = 183	Yes = 61(31%) No = 137(69%) <i>n</i> = 198
Had vaginal sex in past 2 months	Pretest ^a	Yes = 38(63%) No = 22(37%) <i>n</i> = 60	Yes = 42(71%) No = 17(29%) <i>n</i> = 59
	Posttest*	Yes = 18(16%) No = 95(84%) <i>n</i> = 113	Yes = 43(26%) No = 124(74%) <i>n</i> = 167
	2-month follow-up	Yes = 22(20%) No = 86(80%) <i>n</i> = 108	Yes = 34(21%) No = 127(80%) <i>n</i> = 161

Note. ^aAt pretest, only those participants who indicated that they had ever been sexually active were asked about vaginal sexual activity in the prior 2 months. The rest of the frequencies include all the participants. **p* = .05.

with which they planned to use condoms during the next 2 months, $F(1,115) = 1.34$, $p > .05$. However, at the 2-month follow-up, intervention participants planned on using condoms on a more frequent basis when having vaginal sex, $F(1,96) = 3.86$, $p = .05$. When compared on the number of times they used condoms during vaginal sex during the past 2 months, there was no group difference at posttest, $F(1,24) = .01$, $p > .05$. However, intervention participants reported using condoms more often at follow-up, $F(1, 18) = 7.18$, $p < .05$. There was also no group difference at posttest, $F(1, 41) = 2.42$, $p > .05$, nor at the 2-month follow-up, $F(1, 35) = .01$, $p > .05$ when compared on the number of sex partners they had during the past 2 months.

DISCUSSION

This study examined the effects of a comprehensive theory-based, culture-specific HIV prevention intervention (SHERO's) for Mexican American female adolescents. Findings revealed that participants in the SHERO's intervention, as compared with youth in the brief comparison intervention, demonstrated positive changes over time in the psychosocial outcome variables of HIV/AIDS and STI knowledge, self-esteem, beliefs related to a woman's control of her sexuality, beliefs related to sexual coercion, perceived peer norms supporting sexual health, and positive condom attitudes. At the posttest assessment, SHERO's participants were more likely to have abstained from sexual activity and to have carried condoms during the prior 2 months, and at the 2-month follow-up they were more likely to have used condoms when having vaginal sex in the previous 2 months and to intend on using condoms in the future.

A unique and sustained feature of the intervention outcome was the significant changes in perceptions regarding a woman's control of her sexuality during heterosexual sexual interactions and the acceptability of sexual coercion and assault. Participants reported alterations in their beliefs that women typically indicate an unwillingness to engage in sex when they actually want to have sex, or that "no" really means "yes" in sexual situations (token refusal). This represents movement from a sexual belief system where male sexual partners are expected to interpret a female partner's intentions regarding sexual contact

TABLE 3. Behavioral Outcome Scores at Pretest, Posttest and 2-Month Follow-Up and Results of ANCOVA Test^a

Behavioral Outcome	Time Point	Intervention Mean (SD)	Comparison Mean (SD)
Carry condoms in last 2 months ^b	Pretest	1.53(.95)	1.98(1.19)
	Posttest**	2.38(1.21)	1.69(1.06)
	2-month follow-up	1.38(.96)	1.81(1.21)
Plan to use condoms when having sex ^c	Pretest	6.01(2.83)	5.77(2.99)
	Posttest	2.11(2.00)	2.62(2.23)
	2-month follow-up†	2.27(2.06)	3.12(2.24)
Number of times used condoms during past 2 months	Pretest	4.10(8.05)	2.83(7.03)
	Posttest	6.82(5.98)	4.56(3.58)
	2-month follow-up*	8.88(7.16)	2.77(2.42)

Note. ANCOVA = analysis of covariance. ^aAnalyses conducted only on participants who were sexually active. ^bResponses were indicated on a Likert scale with higher values indicating greater frequency of the behavior.

* $p < .05$. ** $p < .01$. † $p < .05$.

before making sexual advances, to a more assertive role for women where they state their sexual expectations directly to their partners (Muehlenhard & Felts, 1998; Muehlenhard & Hollabaugh, 1988). Participants also changed their belief that if a woman behaves as though she wants to engage in sex when in fact she does not, then a man is justified in forcing her to have sex. This change is indicative of a sexual belief system that transfers the blame for sexual coercion and assault from the female victim to the male perpetrator (Muehlenhard & Felts, 1998; Muehlenhard & MacNaughton, 1988).

These shifts represent health protective effects because young women who support engaging in token refusal to have sex and who believe that sexual coercion/assault are justified in certain circumstances have been shown to respond more passively to unwanted sexual advances and to report engaging in unwanted sexual activity with a male partner (Muehlenhard & Hollabaugh, 1988; Muehlenhard & MacNaughton, 1988). Such permissiveness and passivity places these young women at greater risk for date rape and sexual aggression—situations that present increased risk for HIV transmission (Richert, Vaughan, & Wiemann, 2002). This suggests that culturally based gender norms and sexual role expectations should be addressed in HIV prevention interventions for young Mexican American females, since such factors may impact these young women's ability to protect themselves from threats to their sexual health and safety.

Our finding regarding increases in peer norms that are supportive of HIV protective behaviors among SHERO's participants have several important implications as well. Peers serve as strong socializing agents in the development of adolescents' attitudes and expectations regarding dating and sexuality, and ultimately in their actual sexual behaviors (Christopher, 2001; Dolcini, Harper, Watson, Ellen, & Catania, 2005; Harper, Gannon, Watson, Catania, & Dolcini, 2004). Thus, if youth feel that their peers are supportive of sexual health protective behaviors (e.g., using condoms, abstaining from sex), they will be more likely to also participate in such behaviors. Peer influences may have been particularly salient in the current study because 64% of SHERO's participants reported that they always came to the sessions with their friends. The potentially positive influence of peers is supported by reviews of existing HIV prevention interventions, which have shown that

perceived norms and social connectedness are key factors in successful interventions for adolescents (Kirby, 2001; Pedlow & Carey, 2004), as well as findings from friendship-based HIV prevention interventions that utilize the power of peer norms to support positive behavior change (Dolcini et al., 2008; Stanton et al., 1996). Forthcoming manuscripts will conduct more in-depth moderation and mediation analyses to further explore the effects of such psychosocial outcomes (e.g., peer norms, perceptions of a woman's control of her sexuality, acceptability of sexual coercion and assault) on sexual health-related behaviors.

The overall findings highlight the value of culturally grounded HIV prevention programs for Mexican American youth that are created in collaboration with community members and address ecological factors affecting adolescent sexual behaviors (Jemmott et al., 2005; Lesser, Koniak-Griffen, Gonzalez-Figueroa, Huang, & Cumberland, 2007; Pantin et al., 2004). Results are also consistent with the psychosocial and psycho-educational factors that are integral to successful progression through the three stages of the ARRM (Catania et al., 1990). For example, knowledge regarding HIV transmission routes and outcomes is posited as a psycho-educational factor that influences perceived risk of infection, which occurs at Stage 1.

Although several meaningful constructs were significantly impacted by the SHERO's intervention, one variable was found to improve more for the comparison condition. Although youth in both conditions demonstrated an increase in their reported ability to discuss health protective concerns with sexual partners, only the comparison condition difference was statistically significant. This may have been partially related to the finding that participants in the SHERO's condition reported decreases in sexual activity following the intervention, offering less opportunity to practice and use their sexual communication skills with sexual partners.

Nonsignificant findings were reported for sexual assertiveness, sexual decision making, and other behavioral outcomes. Limited power to detect differences, because of the small proportion of female youth who reported having sexual partners, may partially account for the lack of significant findings. Furthermore, these findings suggest that acting on the commitment to change (as described in the third stage of the ARRM), depends greatly on the relational context of an individual. That is, although participants might have perceived themselves to be at risk for HIV and developed a conscious commitment to preventing infection, they did not change their behavioral practices (e.g., employ sexual assertiveness skills) because they were not currently sexually active. These results coupled with the occurrence of group differences in condom use at the 2-month follow-up and not at immediate posttest, also support the need to evaluate intervention effects for longer periods of time (e.g., 12-month follow-up), as other prevention trials have observed delayed intervention effects (Jemmott et al., 2005; Lauby, Smith, Stark, Person, & Adams, 2000; Sales, Smith, Curran, & Kochevar, 2006). Longer follow-up periods also provide more opportunities for participants to implement safer sex practices with existing and new sexual partners (St. Lawrence, Wilson, Eldridge, Brasfield, & O'Bannon, 2001).

Some potential study limitations should also be noted. First, similar findings might not be obtained with Mexican American adolescent males, female youth from other Latino ethnic groups, or with monolingual Spanish-speaking youth. Second, the study design and implementation were affected by limitations common to CBPR and applied community research projects. In accordance with CBPR principles and processes, this study involved community members in all phases of the intervention/research design, implementation, and interpretation (Israel, Schulz, Parker, & Becker, 2001; Minkler & Wallerstein, 2003); thus, scientific controls utilized in more rigorous studies (e.g., randomized clinical trials) were not always feasible. In addition, both interventions were delivered by staff members from the CBO involved in the CBPR project. Given these limitations and others noted earlier, it

was not possible to randomly assign participants to treatment conditions. Because the key internal validity issue when using quasi-experimental designs is the degree to which the two groups are comparable prior to the study, the team selected the SHERO's and comparison intervention neighborhoods and participants carefully in an attempt to mitigate the effects of selection bias.

Owing to financial and human resource limitations, the team was unable to provide an attention control comparison group for 9 consecutive weeks each time the SHERO's intervention was conducted. Because the amount of time participants were exposed to intervention staff was not equivalent across groups (one session vs. nine sessions), some intervention effects may be attributed to increased attention in the SHERO's condition. Another limitation involves the low internal consistency of one psychosocial outcome, self-esteem, at baseline ($\alpha = .37$), although the internal consistency of this measure increased at posttest ($\alpha = .78$) and 2-month follow-up ($\alpha = .85$). Because the study outcomes were dependent upon participants' self reported attitudes, beliefs, and behaviors, cultural proscriptions regarding sex-related topics and gender norms may have resulted in some degree of reporting bias. In addition, greater attrition from pre- to posttest was observed among SHERO's participants, for whom there was a greater level of commitment required over the duration of the 9-week program. Participant dropout may have been due to a lack of sustained interest or motivation to attend the group sessions, scheduling conflicts (e.g., after school activities, family vacations), and/or difficulties accessing the intervention location. Although differential nonrandom attrition between pre- and posttest may present a threat to internal validity in quasi-experimental studies, the lack of statistically significant differences on key sociodemographic variables between those who dropped out and those who remained, coupled with decreased attrition after the posttest, suggests a lower likelihood of this threat.

CONCLUSION

Although the need to develop and evaluate ethnic-specific HIV prevention programs has been noted in the extant literature, this study highlights several issues to address. To ensure cultural appropriateness, key ecological factors that are culturally relevant to the targeted audience should be addressed. In the current study, CBPR methods and an extensive collaborative intervention development process helped to create HIV prevention strategies that addressed community and cultural norms and gender role expectations for Mexican American female adolescents. Future interventions may consider addressing other ecological and cultural factors (e.g., acculturation, familial norms/expectations, ethnic pride) that are relevant to the lives of Mexican American adolescents. Promising approaches to reducing sexual risk behavior can also be enhanced through the use of CBPR methods that incorporate partnerships between the targeted audiences, health professionals, service providers, and community members. Such collaborations not only help inform the development of strategies that are most relevant to a particular subgroup of adolescents but also may increase the likelihood that interventions will be implemented and sustained by CBOs—especially since CBOs deliver the majority of HIV prevention services to Latinos and other communities of color in the United States. Continued funding for CBPR and community-based intervention activities is needed to ensure that appropriate and sustained HIV prevention messages reach those at greatest risk. Given the scope and complexity of influences that can affect adolescents' sexual behavior, it is imperative that innovative and effective HIV prevention strategies be sustained over protracted periods of time.

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