

Using Theatrical Presentations as a Means of Disseminating Knowledge of HIV/AIDS Risk Factors to Migrant Farmworkers: An Evaluation of the Effectiveness of the *Infórmate* Program

Joseph D. Hovey · Victoria Booker · Laura D. Seligman

Published online: 21 December 2006
© Springer Science + Business Media, LLC 2006

Abstract Previous research has suggested that Mexican migrant farmworkers are at elevated risk for contracting HIV/AIDS and that they are in need of receiving HIV/AIDS-related education. The present study evaluated the impact of the *Infórmate* adolescent theater program on HIV/AIDS knowledge and attitudes among farmworker audience members of various ages. Audience members from 7 migrant farmworker camps completed a self-administered questionnaire before and after they observed the *Infórmate* performance. Paired-samples *t*-tests and McNemar tests indicated an increase in knowledge in “modes of HIV transmission,” “body fluids that can transmit HIV,” and items assessing HIV/AIDS “myths.” In addition, a greater percentage of farmworkers at posttest reported that they believed that condoms should always be used during sex. The overall find-

ings from this study suggest that theater can be an effective medium for increasing HIV/AIDS-related knowledge among migrant farmworkers. However, it is suggested that, because some farmworkers held false beliefs regarding modes of HIV transmission after viewing the theater program, theater used in combination with other prevention activities may provide for a more comprehensive educational experience.

Keywords *Infórmate* theater program · HIV/AIDS risk · HIV/AIDS prevention · HIV/AIDS knowledge · Mexican migrant farmworker

There is some indication that Latinos in the United States are at relatively high risk for contracting HIV/AIDS. For example, in the 25 states that had integrated HIV and AIDS surveillance through 1997, the Centers for Disease Control and Prevention (CDC) found that HIV diagnoses among Latinos increased by 10% between 1995 and 1996 [1]. In addition, in the year 2000, Latinos represented 13% of the population in the United States but accounted for 19% of the new AIDS cases reported to the Centers for Disease Control [2]. The AIDS incidence rate for Latinos in the year 2002 was 22.5 per 100,000 individuals, which was nearly 3.5 times the incidence (6.6) for white individuals [2].

The more specific Latino subgroup of migrant farmworkers appears to be at even greater risk for exposure to HIV/AIDS. Migrant farmworkers are defined as individuals who migrate from one location to another to earn a living in agriculture. It has been estimated [3] that there are over four million migrant farmworkers in the U.S. Migrant farmworkers generally live in the southern half of the U.S. during the winter and migrate north before the planting or harvesting seasons. Although precise estimates of HIV prevalence in migrant farmworkers are difficult to attain because of their migratory lifestyle, studies in North Carolina [4], Florida

Joseph D. Hovey, author for correspondence concerning overall findings and implications.

Victoria Booker, author for correspondence concerning detail about the *Infórmate* Program.

Joseph D. Hovey (✉)
Program for the Study of Immigration and Mental Health,
Department of Psychology,
University of Toledo,
Toledo, OH 43606, USA
e-mail: joseph.hovey@utoledo.edu

Victoria Booker
Migrant Health Promotion,
225 West Michigan Ave., Saline, MI 48176, USA
e-mail: tbooker@migranthealth.org

L. D. Seligman
Department of Psychology,
University of Toledo,
Toledo, OH 43606, USA
e-mail: laura.seligman@utoledo.edu

[5–6], New Jersey [7], and South Carolina [8] migrant labor camps documented prevalence rates that ranged from 2.6% to 13% of farmworkers.

Risk factors for HIV/AIDS among migrant farmworkers

Several factors appear to contribute to HIV/AIDS risk in migrant farmworkers. First, it is not uncommon for Latino farmworkers to self-inject antibiotics and vitamins with a needle. In a sample of Mexican migrant farmworkers in Georgia, Lafferty et al. [9] found that 21.2% of participants ($N = 378$) reported self-injecting vitamins and/or antibiotics and that 3.2% self-injected with a shared needle. McVea [10] found that 12% of a sample ($N = 532$) of Mexican migrant farmworkers in North Carolina reported self-injection. Lafferty et al. and McVea observed that the notion of injections being superior over oral forms of medication is a widely held cultural belief among many Latino farmworkers and that needle-sharing is often not perceived as a dangerous behavior.

Sex without using a condom, lack of knowledge concerning condom use, and sex with prostitutes are further risk factors [9, 11–16]. In Lafferty et al.'s [9] sample, 26.4% of farmworkers in the past year had multiple sex partners without use of a condom. In the same time period, 18.5% of the male farmworkers relied on the services of prostitutes.

In a sample ($N = 87$) of Mexican migrant farmworkers from Guadalajara, Mexico, Organista et al. [11] found that the reported frequency of condom use during the past year was approximately 50%. Knowledge of proper condom use was problematic in two-thirds of the farmworkers. For example, the majority of farmworkers did not know whether one should unroll a condom before putting it on the penis or whether one should grab a condom while withdrawing from a partner after ejaculation.

In a sample ($N = 501$) of Mexican migrant farmworkers in Jalisco, Mexico, Organista et al. [12] found that men reported more condom use than women for both occasional (“always use condoms” for men = 71%; women = 41%) and regular sex partners (21% vs. 15%). However, 44% of men reported having sex with prostitutes while working in the U. S. and 13% of men had participated in the practice of several men sharing the same prostitute in succession. Although married men had sex with prostitutes as often as unmarried men did, married men reported less condom use with prostitutes, thus bringing significant risk to their wives in Mexico. In fact, Salgado de Snyder et al. [14] found that only 13% of women in migrant sending communities in Jalisco, Mexico used condoms when having sex with their spouses who worked as migrant farmworkers in the U.S.

Hirsch et al. [15] documented that some wives who remain in migrant sending communities in Mexico may experience “an illusion of fidelity” that may increase their risk

to HIV exposure. That is, in comparison to older women, younger women tended to express a marital ideal that was characterized by mutual intimacy, communication, joint decisionmaking, and sexual pleasure. Despite their recognition that many men are sexually active during their temporary labor migration, these generational differences appeared to decrease the younger women's willingness to use condoms when having sex with their husbands, as the women experienced sex without a condom as a mutual act of trust.

Similar to Organista et al. [12], in a sample ($N = 50$) of Mexican male farmworkers in Orange County, California, Magaña [16] documented the practice of several male farmworkers having sexual intercourse with the same prostitute in a short time period. The majority of men did not use condoms during this practice, thus allowing for the possibility of HIV transmission from male to female, female to male, and male to male. Moreover, almost all of the prostitutes with whom the farmworkers had sexual intercourse appeared to be intravenous drug users.

HIV/AIDS knowledge among Latino migrant farmworkers

Erroneous beliefs about HIV/AIDS may increase the risk of contracting HIV. Research has suggested that migrant farmworkers may lack basic HIV/AIDS-related knowledge. For example, in a sample ($N = 67$) of male farmworkers in Georgia, Foulk et al. [17] found that 39% did not know that AIDS was fatal and that 25% did not know that HIV could be transmitted through vaginal sex, through anal sex, and through the sharing of needles. Fitzgerald et al. [18] found that 20% of Mexican farmworker women ($N = 106$) in Ohio were not familiar with the term “HIV,” 29% were not able to identify blood contact as a mode of HIV transmission, and 36% were not able to identify the sharing of needles as a mode of transmission. Bletzer [19] found that 25% of Mexican farmworkers ($N = 186$) in Michigan were not aware that HIV could be transmitted through the sharing of needles, 19% were unaware that HIV could be transmitted through sexual intercourse, and 40% were unaware that HIV infection were asymptomatic.

Organista et al. [12] found that most of the farmworkers in their sample were knowledgeable about actual modes of HIV transmission such as blood (98%), semen (91%), and vaginal fluids (93%). However, a large portion of the farmworkers believed that they could contract HIV from unlikely modes of transmission such as mosquito bites (40%), public bathrooms (30%), kissing someone on the mouth (30%), and HIV testing (53%). Twenty percent believed that AIDS is only a problem for homosexuals and drug addicts and 27% believed that it is possible to know that a person has HIV by appearance. Farmworkers aged 18–31 were more accurate in their overall knowledge of HIV transmission (78% correct for all transmission items) than were farmworkers aged

32–83 (71% correct); and farmworkers with greater than six years of education were more accurate (80% correct) than were farmworkers with six or less years of education (71% correct).

HIV/AIDS prevention

There is an urgent need for HIV/AIDS prevention for farmworkers, given the prevalence rates and risk factors detailed above. Although several authors [20–22] have suggested avenues for prevention such as television, radio, and the distribution of literature, little systematic findings have been reported in regards to the effectiveness of such activities [23]. Moreover, numerous obstacles exist that may hinder the setting up of prevention activities. These include farmworkers' geographical isolation, high mobility, lack of access to media, poverty, language and literacy difficulties, distrust of outsiders, and the stigmatization often associated with HIV/AIDS [21–24]. Any effective prevention would therefore need to be accessible, address issues in a culturally and linguistically sensitive and appropriate manner, and make efforts towards reducing stigmatization. Studies by Mishra and colleagues [25–26] appear to meet these criterion.

Mishra and Conner [25] evaluated the effectiveness of a *fotonovela* (photo story book) educational program on the HIV knowledge, attitudes, and behaviors of migrant farmworker men in Orange County, California. The bilingual *fotonovela* depicted three situations: a male farmworker abstains from sex with a prostitute; a male farmworker has sex with a prostitute but uses a condom; and a male farmworker has unprotected sex with a prostitute, is infected with HIV, and infects his wife and unborn child with HIV. Farmworkers in the experimental group ($n = 52$) were given three weeks to read the *fotonovela*. In comparison to a control group ($n = 37$) of farmworkers who had yet to be exposed to the *fotonovela*, the experimental group reported a greater increase of knowledge in the areas of HIV transmission, prognosis severity, and signs of HIV; more positive attitudinal changes regarding condom use; and a greater increase in frequency of condom use during sex with prostitutes. In addition to the exposure of the *fotonovela*, the authors attributed these changes to men modeling the behavior of those men who used condoms when having sex with prostitutes.

Mishra et al. [26] examined the impact of integrating discussion sessions into the *fotonovela* program. The first experimental group ($n = 88$) consisted of farmworker men who were exposed to the *fotonovela* educational material and who attended four facilitated group discussions about the educational material held at labor camps over a two-week time span. The second experimental group ($n = 99$) was exposed to only the *fotonovela* material and the control group ($n = 94$) had yet to be exposed to either. Mishra et al. found

that, in comparison to the control group, both experimental groups reported greater increases in knowledge and substantially larger increases in the use of condoms during sex with prostitutes. In regards to the latter, 97% of farmworkers in experimental group one reported using condoms at three-months posttest compared to 20% of farmworkers at pretest; 92% of farmworkers in experimental group two reported condom use at three-months posttest compared to 29% at pretest; and only 17% of farmworkers in the control group reported condom use at three-months posttest compared to 18% at pretest. Farmworkers exposed to both the *novelas* and group discussions reported slightly more changes than farmworkers who were only exposed to the *novelas*. The authors therefore concluded that integrating educational material with group discussions enhances the social reality of the learning, thus providing for longer-lasting knowledge and behavioral changes.

Theater as a prevention technique

Research findings suggest that theater programs may be an effective avenue for disseminating information about HIV/AIDS. Almost all of the published research that assessed theater as a prevention technique has been conducted in countries other than the U.S. For example, Valente and Bharath [27] conducted predrama and postdrama interviews with randomly selected audience members ($N = 93$) from 10 separate performances in Tamil Nadu state, India. They found a significant increase in HIV/AIDS-related knowledge and, after viewing the performance, significantly less audience members reported that they would “shun a neighbor” if they discovered that she or he had AIDS. Skinner et al. [28] evaluated the Puppets against AIDS program, a street theater program targeted to South African community members. They conducted predrama and postdrama interviews with a convenience sample ($N = 208$) obtained from 21 performances in Cape Town and found that correct knowledge was significantly increased in 5 of 7 knowledge questions (e.g., knowledge of modes of transmission). Participants also reported an increase in intended protective behaviors (intentions of being monogamous and using condoms). Denman et al. [29] evaluated a theater program targeted to adolescent students in Nottingham, England and found that the experimental group ($n = 252$) reported greater knowledge and attitudinal changes in comparison to the control group ($n = 428$).

In regards to research conducted in the U.S., Hillman et al. [30] evaluated the effectiveness of the New Image Teen Theatre in San Diego by giving pretest and posttest questionnaires to 143 adolescent audience members. Following the performance, adolescents demonstrated greater HIV and STDs related knowledge, more willingness to discuss sexual issues with others, and greater intention to use

birth control. Finally, DiIorio et al. [31] found that 8th grade students in Georgia who viewed an HIV/AIDS-based play reported greater HIV/AIDS knowledge than a control group and maintained their increase in knowledge at two-months posttest.

Purposes of present study

As indicated, theater as a prevention technique has been used effectively in contexts outside of farmwork. Theater would appear however to have great potential as a prevention technique for farmworkers as well. First, theater would be accessible, as performances can be held onsite at farmworker camps. Moreover, because storytelling is embedded in Latin culture and can be understood by individuals with limited education, theater would be a culturally appropriate mechanism for sharing information. Finally, theater would be able to convey sensitive material to large numbers of individuals at once and audience members would be able to participate at the level they felt comfortable, thus increasing participation while helping to reduce discomfort and the stigmatization often associated with HIV/AIDS-related issues.

The present article reports findings from the *Infórmate* program, a health education program implemented by Migrant Health Promotion that disseminates HIV/AIDS and other health-related information to Mexican migrant farmworkers in Michigan. In specific, this study assessed the impact of the *Infórmate* theater troupe on HIV/AIDS-related knowledge and attitudes among farmworker audience members.

Methods

Participants and procedure

Data were collected from selected audience members from 7 theater performances held at 7 migrant farmworker labor camps in western Michigan. Participants completed questionnaires assessing HIV/AIDS knowledge and attitudes before and after they observed the performance.

The farmworkers residing at the camps were all of Mexican or Mexican-American origin, with the majority migrating from Texas or Mexico. The distance between the camps varied from a few miles to a hundred miles. The camps were selected for their size or their accessibility, but were not distinguishable in any other way from other camps in the area.

The present sample consisted of 71 participants (59% female; 41% male). Five percent of participants were under 13 years of age; 42% were aged 13 through 18; 15% were aged 19 through 24; and 38% were aged 25 and older.

Description of the *Infórmate* program and teen health aide recruitment and training

Infórmate literally means to “inform yourself.” The *Infórmate* Teen Health Program focuses on health issues relevant to adolescent farmworkers. These include HIV/AIDS, substance abuse, violence, self-esteem, informed decision-making, and occupational health and safety. The program is conducted by Teen Health Aides (THAs) who are adolescent farmworkers trained as peer health educators. The *Infórmate* program uses THAs of the same ethnicity, culture, and socioeconomic status as the target population under the belief that they are ideally suited to provide information on sensitive issues, increase access to services, and offer peer support. Under the training and supervision of a Program Coordinator, the THAs facilitate both one-on-one and group prevention activities in farmworker communities. These activities are held on-site in order to help overcome barriers such as lack of transportation, language differences, and the stigma of visiting AIDS organizations or substance abuse treatment facilities.

The THAs are recruited through door-to-door visits in the migrant farmworker camps and through recommendations from Migrant Education teachers, community representatives, parents, and growers (owners of farms). Teens with the following traits are given priority in recruitment efforts: respect of peers, responsible, interest in health issues, bilingual (Spanish and English), support of parents, ability to participate for the entire work season, and a commitment to be a role model. A proportionate representation of gender, age, and developmental capacities is considered when recruiting. Traditionally, the THAs have been of Mexican descent and their ages have ranged from 13 years to 18 years.

The focus of the current article is the theater program component of *Infórmate*. For membership in the theater troupe, teens were recruited with the additional following traits: acting experience, enthusiasm for learning and educating others, flexible work schedule, parental support, comfortable presenting and acting in Spanish, and willingness to work on weekends. The final theater group was comprised of three boys and three girls, aged 13–17 years. To our knowledge, the traveling theatrical component of *Infórmate* is the only program of its kind in Michigan.

All *Infórmate* sites follow a training model whereby the THAs participate in an initial two-week, intensive training, followed by weekly training. The content followed the *Infórmate Manual*, which includes chapters on sexuality, reproductive health, sexually transmitted infections, HIV/AIDS, substance abuse, violence, and occupational health and safety.

For the present program, the training—conducted primarily in English—was led by a Program Coordinator with skills

in health education and who was trained as a certified American Red Cross HIV Instructor for the Latino Community. The first week of training focused on HIV basics and the second week focused on reproductive health and sexually transmitted infections. Lesson plans included the use of games, videos, flipcharts, and exercises.

Subsequent weekly training covered the topics of homophobia, substance abuse, HIV testing, contraception, and violence. Guest speakers from HIV-related organizations in the state of Michigan, including a speaker who was HIV positive, provided in-depth training on several occasions. These speakers were enthusiastically received.

Theatrical consultation was provided to *Infórmate* by a doctoral-level expert in the use of theater and health education with farmworkers. During the initial two week training period, the THAs read through the script provided by the consultant and they selected roles that they were interested in playing. To reinforce the idea that the THAs needed to convincingly portray a character separate from themselves, the THAs were assigned to write a description and a story describing one day in the life of their character. The THAs then underwent a week-long training on theater and acting that was facilitated by the consultant. During this time, the THAs revised the script, received training in acting, and began to rehearse their parts and scenes. They carefully studied the script, scene by scene, and changed dialogue to better reflect their characters and experiences and to ensure equal parts for everyone. The THAs were adamant about writing and performing in Spanish. Lastly, the group decided to include poetry into their performance for dramatic impact. They selected poems related to HIV/AIDS (from a set of poems that were provided by the consultant) and converted the poems into “letters” read by each character.

The THAs participated in two other theater training opportunities. They participated in a theater workshop led by two teen theater troupes where they were able to compare and discuss their work. They also attended a performance of *A Midsummer Night's Dream*. The purpose of both events was to expose the THAs to the acting of other teens and to motivate them to improve their own performances. Most of the THAs had never seen a live theater production.

Topics addressed in performance

The final script included both dramatic scenes and a game show that was designed to add a degree of levity while further providing information on HIV/AIDS. The characters portrayed by the THAs exhibited an assortment of myths, misconceptions, and accurate information related to HIV/AIDS. Situations portrayed by the THAs included

anger and denial upon finding out about one's HIV positive status; HIV testing; the reluctance to use condoms; the risks of having unprotected sex; and living with HIV. The drama portion of the program ended with the characters relaying educational and empowering messages to the audience.

This was followed by the reading of poetry and the game show. The game show consisted of audience members participating in a risk continuum exercise. Audience members were given velcro cards with different behaviors listed on them and were asked to attach them to a folding exhibition core board divided into three categories for exposure to HIV: No Risk, Some Risk, High Risk. The THAs then examined the placement of the cards by category, explained why the card was in the correct area or belonged in another area, and corrected any misinformation.

Evaluation of performance

At the end of the performance, the participants were invited to provide feedback concerning the overall performance. The majority of comments were positive and brief (e.g., “good job”). Suggestions for improvement included “perform more,” “do not repeat things,” “be louder and more dramatic,” and “talk more to teens, because in our heritage, our teens need more information.”

Measure of HIV/AIDS-related knowledge and attitudes

As noted, at pretest and posttest, participants completed a questionnaire that quantitatively assessed levels of HIV/AIDS-related knowledge and attitudes. The time gap between the pretest and posttest was approximately one hour to one and a half hours, depending upon the level of audience engagement and interaction. The questionnaire was available in either Spanish or English and took approximately 5 min to complete. Each of the knowledge items on the questionnaire was addressed in the performance.

The questionnaire items used in the present study were adapted from the Safer Choices Student Health Questionnaire and from the Healthy Oakland Teens Survey, provided by the Center for AIDS Prevention Studies. These questionnaires have been shown [32–34] to have adequate internal consistency reliability and construct validity.

Modes of HIV transmission

“Modes of HIV transmission” were assessed through participants' responses to the following statement: “Please mark all the ways you can get infected with HIV.” The eight response choices to the statement are listed in Table 2. The score for modes of transmission was calculated by summing

the number of correct responses with possible scores thus ranging from 0 to 8.

Body fluids that can transmit HIV

“Body fluids that can transmit HIV” were measured through responses to the following statement: “Please mark which body fluids can infect you with HIV.” The six response choices are listed in Table 2. The score for body fluids was formed by summing the number of correct responses. Possible scores thus ranged from 0 to 6.

General HIV knowledge

The questionnaire included four true-false items that were used to assess other aspects of HIV knowledge. These four items are listed in Table 2. The number of correct responses for these 4 items were summed to create a “general HIV knowledge” score with a possible range of 0 to 4.

Overall knowledge scores were calculated by summing the scores for modes of transmission, body fluids, and general knowledge. Possible overall knowledge scores ranged from 0 to 18.

Attitudes concerning HIV/AIDS

The following two items assessed participants’ attitudes concerning HIV/AIDS. “If someone you know had HIV or AIDS, would you be afraid to hang out with them or help them in any way?” “I believe condoms (rubbers) should always be used if a person my age has sex.” The possible responses for each of these items were “definitely yes,” “probably yes,” “probably no,” and “definitely no.”

Data analyses

Paired-samples *t*-tests were conducted to measure differences in pretest mean knowledge scores and posttest mean

knowledge scores on the variables of modes of transmission, body fluids, general knowledge, and on the total number of correct knowledge responses. Cohen’s effect sizes (*d*) were calculated for each knowledge variable to estimate the impact of the *Infórmate* program on participants’ level of HIV/AIDS-related knowledge. Traditionally, *d* values of .2, .5, and .8 represent small, medium, and large effect sizes, respectively [35].

To identify the individual knowledge items that revealed the most change, McNemar tests were run for each individual knowledge item. The McNemar is a nonparametric test for two related dichotomous variables. It evaluates whether the proportion of participants who fall into a category on one variable differs significantly from the proportion of participants who fall into the same category on a second variable (e.g., comparison of pretest knowledge variable 1 to corresponding posttest knowledge variable 1) [35]. It is useful for detecting changes in responses due to experimental interventions in pretest-posttest designs. For the purposes of conducting the present McNemar tests, each knowledge variable was coded as 0 = incorrect response and 1 = correct response.

McNemar tests were also conducted to identify changes in each of the two attitude items. For the item of “If someone you know had HIV or AIDS...,” “definitely no” was coded as 1 and the other responses were coded as 0. For the item of “I believe condoms (rubbers) should always be used...,” “definitely yes” was coded as 1 and the other responses were coded as 0.

Results

Differences in mean scores of pretest and posttest knowledge

Table 1 shows the differences between the pretest and posttest mean scores for the variables of modes of transmission, body fluids, general knowledge, and on the total number of correct responses. Paired-samples *t*-tests indicated that participants

Table 1 Differences in mean scores of knowledge variables at pretest and posttest

Variables	Pretest mean (SD)	Posttest mean (SD)	<i>t</i>	<i>d</i>
Modes of transmission	6.97 (1.4)	7.32 (0.9)	− 2.42*	.30
Body fluids	4.35 (1.2)	4.97 (1.2)	− 4.08***	.51
General knowledge questions	2.21 (1.5)	2.52 (1.5)	− 3.13**	.39
Total correct	13.54 (3.4)	14.82 (2.8)	− 4.83***	.60

Note. Significance levels are based on one-tailed paired samples *t*-tests.

p* < .01, *p* < .001, ****p* < .0001.

d = Cohen’s effect size.

Possible scores ranged to 8 for modes of transmission, 6 for body fluids, 4 for knowledge questions, and 18 for total correct.

Table 2 Proportion of farmworkers correctly responding to items assessing HIV/AIDS knowledge at pretest and posttest

Individual knowledge items	Percentage correct	
	Pretest	Posttest
<i>Ways you can get infected with HIV</i>		
Handshake (n) [†]	94.4	100
Drinking from the same glass (n) [†]	90.1	98.5
Having sex without using a condom (y)	94.4	95.5
Mosquito bite (n)*	83.1	92.5
Sitting on a public toilet (n)	78.9	85.3
Sharing needles (y)	84.5	85.3
Touching or hugging someone (n) [†]	94.4	98.5
From a mother to a baby (y)	77.5	72.1
<i>Body fluids which can infect you with HIV</i>		
Blood (y)	97.2	90.9
Saliva (n)***	71.8	90.9
Breast milk (y)**	47.9	65.7
Vomit (n)*	91.5	100
Semen (y) [†]	66.2	76.1
Vaginal fluid (y)*	60.6	73.1
People who have HIV feel and look sick most of the time (f)	47.1	53.7
Most people who are infected with HIV know they have it (f) [†]	51.4	58.2
If used correctly, condoms (rubbers) can reduce the risk of getting infected with HIV (t)*	62.0	74.2
If you get tested for HIV and your test is negative you don't need to worry about getting infected with HIV in the future (f)	60.0	64.6

Note. (y): “yes” scored correct; (n): “no” scored correct; (t): “true” scored correct.; (f): “false” scored correct. Significance levels are based on one-tailed McNemar tests. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

reported significantly greater HIV/AIDS-related knowledge for each variable after viewing the performance (significance levels ranged from $p < .01$ to $p < .0001$).

The Cohen’s effect sizes in Table 1 indicated that the theater performance had a small to medium effect on modes of transmission and on the general knowledge statements, and a medium to large effect on body fluids and on the total number of correct responses.

Pretest and posttest differences for individual knowledge items

In addition to documenting the mean pretest and posttest differences in knowledge, we were interested in identifying the individual knowledge items that showed the most change. Table 2 lists the percentage of participants who correctly responded to each item at pretest and posttest. McNemar tests revealed significant increases in knowledge for 11 of the 18 items. More specifically, significant increases in knowledge were evident for 4 of the 8 modes of transmission items, 5 of the 6 body fluid items, and 2 of the 4 general knowledge statements.

The items that showed the strongest increase in knowledge were (in decreasing order of strength) saliva, breast milk, vomit, mosquito bite, condoms reducing risk of infection, vaginal fluid, drinking from the same glass, handshake, semen, people who are infected know it, and touching or hugging someone.

Attitudes concerning condom use

There was no significant pretest-posttest change in scores for the item of “If someone you know had HIV or AIDS, would you be afraid to hang out with them or help them in any way?”

In response to the item of “I believe condoms (rubbers) should always be used if a person my age has sex,” a greater percentage of participants reported “definitely yes” at posttest (66.7% pretest vs. 76.2% posttest) (McNemar test $p = .05$).

Discussion

Previous studies have suggested that Mexican migrant farmworkers are at high risk for contracting HIV/AIDS and that they have relatively low levels of HIV/AIDS-related knowledge. It is thus imperative that HIV/AIDS prevention programs are directed toward this population. The present study represents such an effort. It was conducted to determine whether the *Infórmate* theater program effectively disseminated information about HIV/AIDS.

Similar to previous findings from research [27–31] that assessed theater in contexts other than farmwork, the present findings support the idea that theater can be an effective tool for disseminating HIV/AIDS-related information among migrant farmworkers. The *Infórmate* program had an overall positive impact. After viewing the performance, the

migrant farmworkers reported an overall increase in HIV/AIDS knowledge. In specific, participants revealed increased accuracy in the variables of “modes of HIV transmission,” “body fluids” that transmit HIV, and “general HIV knowledge.” In addition, after viewing the performance, more participants believed that condoms should be used when having sex.

The present findings indicated significant increases for 11 of the 18 individual knowledge items. These findings are especially impressive given the high percentage of correct responses to several of the pretest items. Despite these, there were still significant increases for “handshake” (94.4% vs. 100%), “drinking from the same glass” (90.1% vs. 98.5%), “touching or hugging someone” (94.4% vs. 98.5%), and “vomit” (91.5% vs. 100%). A ceiling effect, however, may explain the lack of knowledge gain for at least two of the remaining items. At pretest, 94.4% of participants correctly responded to “having sex without using a condom” and 97.2% correctly responded to “blood.”

Theater may be effective as a prevention technique for a variety of reasons [23, 27–30, 36, 37]. For example, it addresses both the affective and the cognitive domains of learning, both of which are important when educationally addressing complex and emotionally-laden issues such as HIV/AIDS risk. In addition, given the audience members’ proximity to the performers, theater retains the immediacy of interpersonal contact and audience members can readily identify with the performers and the topics addressed, especially when the audience and performers are similar in background as in the present study. Theater can be culturally and linguistically appropriate and can be understood by individuals with limited formal education. Finally, theater is cost-effective in terms of reaching many individuals; it can be used in conjunction with other media and counseling; and it is a portable, nonintrusive informational tool.

In their examination of correlates of AIDS susceptibility among migrant farmworkers in Florida and Delaware, McBride et al. [38] found that perception of AIDS susceptibility was significantly related to a subsequent reduction in sexual risk behaviors. This finding has relevance for the present study to the extent that the *Infórmate* program and the further knowledge of risk factors may have increased the participants’ perceptions of being susceptible to HIV/AIDS.

Although knowledge of HIV/AIDS does not ensure behavioral changes, it does appear to be a necessary component of change. In other words, it appears unlikely that reductions in risk behaviors will occur without accurate knowledge of HIV/AIDS (e.g., the modes of HIV transmission). Previous findings (e.g., [39–40]) have indicated that increased HIV/AIDS knowledge is related to greater condom use and a greater likelihood of obtaining HIV testing.

Although there were significant increases indicated for most of the items in the present study, it is important to look

at the items for which limited change was indicated. Some of the items (e.g., “having sex without using a condom”) in the present study assessed knowledge about actual modes of HIV transmission whereas other items (e.g., “sitting on a public toilet”) assessed erroneous modes of transmission and other myths about HIV.

There were no significant pretest-posttest increases for “sharing needles” and “from a mother to a baby.” This is of consequence because these are indeed actual ways that HIV can be transmitted and lack of knowledge here may directly lead to high risk behaviors. Moreover, although significant increases were found for “semen” and “vaginal fluid,” approximately 25% of the participants at posttest believed that these body fluids could not infect people with HIV. Similarly, although there was a significant increase in correct responses for the item regarding condom use, about 25% of the participants at posttest responded incorrectly to this item. Lack of knowledge here may lead to the high-risk behavior of unprotected sex. The message to be taken from these findings is straightforward. Even when knowledge increases in actual modes of HIV transmission are indicated, there may still be room for improvement (i.e., individuals still in need of education) and prevention efforts should thus place great emphasis on educating farmworkers about these modes.

On the surface, having misconceptions regarding unlikely modes of HIV transmission may seem less problematic than having misconceptions regarding actual modes of transmission. However, having erroneous beliefs regarding unlikely modes of transmission may also have negative repercussions. For example, individuals holding these false beliefs may be more fearful about coming into contact with someone who has HIV/AIDS. In addition, individuals who believe that HIV is transmitted casually may be less concerned about the actual modes of transmission such as sexual or needle transmission because these might be seen as only a few of the “many” ways that they can acquire HIV [41]. This sense of helplessness might act as a deterrent against prevention efforts. Believing that you can tell people with HIV by their appearance and that people with HIV know they are infected might also serve to deter preventive behavior. Even at posttest, over 40% of participants believed that these statements were true.

Limitations of study and directions for future research

Learning that leads to reductions in high-risk behaviors should be the goal of HIV education and prevention programs. However, because the present study only assessed short-term knowledge gain, it is not known whether the *Infórmate* program led to long-term knowledge gain or consequent changes in high-risk behaviors. Future evaluators of theater and other prevention programs should therefore incorporate followup assessments into their research designs.

Because the camps from which data were collected were not randomly selected and because data collection was limited to Mexican individuals, caution should be taken in generalizing the present findings. In addition, to more precisely detail the impact that theater programs have on HIV/AIDS-related knowledge, attitudes, and behaviors, future evaluators should incorporate control groups into their methodology. The present findings indicated that, even though there were significant increases in HIV/AIDS knowledge, there was “still room for improvement” for several of the items. It is suggested, therefore, that program coordinators consider integrating theater programs with other types of prevention activities in order to provide a more intensive educational experience.

Conclusions

Previous work has suggested that Mexican migrant farmworkers are at elevated risk for contracting HIV/AIDS and are thus in need of receiving HIV/AIDS-related educational prevention. The findings from this study indicate that theater is an effective tool for increasing HIV/AIDS-related knowledge among migrant farmworkers. However, given that some of the present participants still held false beliefs regarding actual and erroneous modes of HIV transmission after the theater program, theater used in conjunction with other HIV prevention activities may provide for more comprehensive education and thus a further increase in knowledge. Future researchers should provide followup assessments in order to ascertain the influence of theater on long-term knowledge gain and risk behaviors.

Acknowledgments This work was funded by a grant from the Michigan AIDS Fund. The authors thank José Blanco, Ph.D., for his consultation in the use of theater and health education. The authors also thank the Teen Health Aides and Program Coordinators for their assistance in coordinating the program and collecting the data.

References

- Centers for Disease Control. Impact of HIV/AIDS on Hispanics in the United States. Available at: <http://www.thebody.com/cdc/hispanic2.html>. 1998
- Center for Disease Control. HIV/AIDS among Hispanics in the United States. Available at: <http://www.cdc.gov/hiv/pubs/facts/hispanic.pdf>. 2002
- Napolitano M, Goldberg B: Migrant health. In: Loue S, editor. Handbook of immigrant health. New York: Plenum Press; 1998. p. 261–276
- Centers for Disease Control. HIV seroprevalence in migrant and seasonal farmworkers—North Carolina, 1987. *Morb Mortal Wkly Rep* 1988; 37:517–519
- Centers for Disease Control. HIV infection, syphilis, and tuberculosis screening among migrant farmworkers—Florida, 1992. *Morb Mortal Wkly Rep* 1992; 41:723–725
- Castro KG, Lieb S, Jaffe HW, Narkunas JP, Calisher CH, Bush TJ, Witte JJ: Transmission of HIV in Belle Glade, Florida: lessons for other communities in the United States. *Science* 1988; 239:193–197
- Lyons M: Study yields HIV prevalence for New Jersey farmworkers. *Migrant Health Newsline Clin Suppl* 1992; 9:1–2
- Jones JL, Rion P, Hollis S, Longshore S, Leverette WB, Ziff L: HIV-related characteristics of migrant workers in rural South Carolina. *South Med J* 1991; 84:1088–1090
- Lafferty J, Foulk D, Ryan R: Needle sharing for the use of therapeutic drugs as a potential AIDS risk behavior among migrant Hispanic farmworkers in the eastern stream. *Int Q Community Health Educ* 1991; 11:135–143
- McVea KLSP: Lay injection practices among migrant farmworkers in the age of AIDS: Evolution of a biomedical folk practice. *Soc Sci Med* 1997; 45:91–98
- Organista KC, Organista PB, de Alba JEG, Morán MAC, Carillo H: AIDS and condom-related knowledge, beliefs, and behaviors in Mexican migrant laborers. *Hispanic J Behav Sci* 1996; 18:392–406
- Organista KC, Organista PB, de Alba JEG, Morán MAC, Carillo LEU: Survey of condom-related beliefs, behaviors, and perceived social norms in Mexican migrant laborers. *J Community Health* 1997; 22:185–198
- Ford K, King G, Nerenberg L, Rojo C: AIDS knowledge and risk behaviors among midwest migrant farm workers. *AIDS Educ Prev* 2001; 13:551–560
- Salgado de Snyder VN, Díaz Pérez MJ, Maldonado M: AIDS: risk behaviors among rural Mexican women married to migrant workers in the United States. *AIDS Educ Prev* 1996; 8:134–142
- Hirsch JS, Higgins J, Bentley ME, Nathanson CA: The social constructions of sexuality: marital infidelity and sexually transmitted disease—HIV risk in a Mexican migrant community. *Am J Public Health* 2002; 92:1227–1237
- Magaña JR: Sex, drugs and HIV: an ethnographic approach. *Soc Sci Med* 1991; 33:5–9
- Foulk D, Lafferty J, Ryan R: AIDS knowledge and behavior in a migrant farmworker population. *Migration World* 1989; 17:36–42
- Fitzgerald K, Chakraborty J, Shah T, Khuder S, Duggan J: HIV/AIDS knowledge among female migrant farm workers in the midwest. *J Immigrant Health* 2003; 5:29–36
- Bletzer KV: Knowledge of AIDS/HIV infection among migrant farmworkers. *Aids Public Policy J* 1990; 5:173–177
- Bronfman M, Moreno SL: Perspectives on HIV/AIDS prevention among immigrants on the U.S.-Mexico border. In: Mishra SI, Conner RF, Magaña JR, editors. *AIDS crossing borders: the spread of HIV among migrant Latinos*. Boulder, CO; 1996. p. 49–76
- Skjerdal K, Mishra SI, Benavides-Vaello S: A growing HIV/AIDS crisis among migrant and seasonal farmworker families. In: Mishra SI, Conner RF, Magaña JR, editors. *AIDS crossing borders: the spread of HIV among migrant Latinos*. Boulder, CO; 1996. p. 27–47
- Aranda-Naranjo B, Gaskins S, Bustamente L, Lopez LC, Rodriquiz J: La Desesperacion: migrant and seasonal farm workers living with HIV/AIDS. *J Assoc Nurses AIDS Care* 2000; 11:22–28
- Organista KC, Carrillo H, Ayala, G: HIV prevention with Mexican migrants: Review, critique, and recommendaions. *J Acquir Immune Defic Syndr* 2004; 37:S227–S239
- Aranda-Naranjo B, Gaskins S: HIV/AIDS in migrant and seasonal workers. *J Assoc Nurses AIDS Care* 1998; 9:80–93
- Mishra SI, Conner RF: Evaluation of an HIV prevention program among Latino farmworkers. In: Mishra SI, Conner RF, Magaña JR, eds. *AIDS crossing borders: the spread of HIV among migrant Latinos*. Boulder, CO; 1996. p. 157–181

26. Mishra SI, Sanudo F, Connor RF: Collaborative research toward HIV prevention among migrant farmworkers. In: Bowser BP, Mishra SI, Reback CJ, Lemp GF, eds. *Preventing AIDS: community-science collaborations*. New York; 2004. p. 69–95
27. Valente TW, Bharath U: An evaluation of the use of drama to communicate HIV/AIDS information. *AIDS Educ Prev* 1999; 11:203–211
28. Skinner D, Metcalf CA, Seager JR, De Swardt JS, Laubscher JA: An evaluation of an education programme on HIV infection using puppetry and street theater. *AIDS Care* 1991; 3:317–329
29. Denman S, Pearson J, Moody D, Davis P, Madeley R: Theatre in education on HIV and AIDS: a controlled study of schoolchildren's knowledge and attitudes. *Health Educ J* 1995; 54:3–17
30. Hillman E, Melbourne FH, Williams L, Hofstetter R, Burdyslaw C: Pregnancy, STDs, and AIDS prevention: evaluation of new image teen theatre. *AIDS Educ Prev* 1991; 3:328–340
31. DiIorio C, Dudley W, Van Marter DF: Project secrets: evaluation of a theatre-based HIV intervention. *National HIV Prevention Conference* 1999; abstract 338
32. Coyle K, Basen-Engquist K, Kirby D, Parcel G, Banspach S, Harrist R, Baumler E, Weil M: Short-term impact of safer choices: A multicomponent, school-based HIV, other STD, and pregnancy prevention program. *J Sch Health* 1999; 69:181–188
33. Wang LY, Davis M, Robin L, Collins J, Coyle K, Baumler E: Economic evaluation of safer choices: A school-based human immunodeficiency virus, other sexually transmitted diseases, and pregnancy prevention program. *Arch Pediatr Adolesc Med* 2000; 154:1017–1024
34. Ekstrand ML, Siegel D, Nido V, Faigles B, Krasnovsky F, Battle R, Cummings G, Chiment E, Coates TJ: Peer-led AIDS prevention delays sexual debut among U.S. junior high school students. Paper presented at the XI International Conference on AIDS, Vancouver, Canada (July, 1996)
35. Green SB, Salkind NJ, Akey TM: *Using SPSS for Windows: analyzing and understanding data*. Upper Saddle River: Prentice Hall; 2000
36. Probart CK: A preliminary investigation using drama in community AIDS education. *AIDS Educ Prev* 1989; 1:268–276
37. McEwan RT, Bhopal R, Patton W: Drama on HIV and AIDS: an evaluation of a theatre-in-education programme. *Health Educ J* 1991; 50:155–160
38. McBride DC, Weatherby NL, Inciardi JA, Gillespie SA: AIDS susceptibility in a migrant population: perception and behavior. *Subst Use Misuse* 1999; 34:633–652
39. Ku LC, Sonenstein FL, Pleck JH: The association of AIDS education and sex education with sexual behavior and condom use among teenage men. *Fam Plann Perspect* 1992; 24:100–106
40. Phillips KA: Subjective knowledge of AIDS and use of HIV testing. *Am J Public Health* 1993; 83:1460–1462
41. Marín BV, Marín G: Effects of acculturation on knowledge of AIDS and HIV among Hispanics. *Hispanic J Behav Sci* 1990; 12:110–121