



Published in final edited form as:

*AIDS Educ Prev.* 2010 August ; 22(4): 371–385. doi:10.1521/aeap.2010.22.4.371.

## REDUCING SEXUAL RISK AMONG FILIPINA FEMALE BAR WORKERS: EFFECTS OF A CBPR-DEVELOPED STRUCTURAL AND NETWORK INTERVENTION

**Donald E. Morisky, Robert M. Malow, Teodora V. Tiglao, Shu-Yu Lyu, Aaron T. Vissman, and Scott D. Rhodes**

Donald E. Morisky is with the Department of Community Health Sciences, University of California, Los Angeles. Robert M. Malon is with the AIDS Prevention Program, Department of Health Promotion and Disease Prevention, Stempel School of Public Health Florida International University, Miami. Teodora V. Tiglao is with the Department of Health Education and Behavioral Sciences, University of the Philippines, College of Public Health, Manila, Philippines. Shu-Yu Lyu is with the Department of Public Health, Taipei Medical University, Taipei, Taiwan. Aaron T. Vissman and Scott D. Rhodes are with the Department of Social Sciences and Health Policy, Division of Public Health Sciences, Wake Forest University School of Medicine, Winston-Salem, NC. Shu-Yu Lyu is with the Department of Public Health, Taipei Medical University, Taipei, Taiwan.

### Abstract

The effects of three interventions designed to reduce sexual risk among Filipina female bar workers (FBWs) were compared with each other and with usual care (nonintervention). The interventions were developed iteratively by a community-based participatory research (CBPR) partnership comprising lay community members, organizational representatives (including nongovernmental organizations), and academic researchers from the United States and the Philippines. Peer educators and bar managers from 110 different establishments in three southern regions were recruited and trained to increase knowledge of HIV and of condom use rules and regulations within establishments, as well as to change attitudes about risk reduction, provide HIV and sexually transmitted infection (STI) testing referrals, and build condom use skills among FBWs. Compared with the control community, all three interventions increased HIV and STI testing; however, only FBWs in the combination peer-educator and manager-training intervention significantly increased condom use from baseline to 2-year follow-up. Condom use was significantly associated with higher HIV knowledge, attendance of a prevention class, and being taught how to use condoms properly. Given these findings, research is warranted to further explore and understand various forms of commercial sex work and to test adapted peer-educator and manager-training interventions within HIV epicenters.

---

Research in Asia and Africa suggests that social norms and institutional and organizational policies within commercial sex establishments influence sexual risk behavior among female commercial sex workers (CSWs) and/or female bar workers (FBWs); (Cohen, Wu, & Farley, 2006; Vuttanont, Greenhalgh, Griffin, & Boynton, 2006). Substantial global literature indicates that alcohol use is related to considerably higher levels of sexual risk behavior, particularly among CSWs, including FBWs (Bryant, 2006). CSWs who drink alcohol with their customers, specifically FBWs, engage in high levels of sexual risk,

particularly inconsistent condom use (Akarro, 2009; Inciardi, Surratt, & Kurtz, 2006; Larios et al., 2009).

The widespread global use of alcohol in both legal (e.g., bars) and illegal (e.g., unlicensed establishments and brothels) drinking establishments, coupled with the specific biobehavioral effects of alcohol, may increase the transmission of HIV and other sexually transmitted infections (STIs) between CSWs and their clients (Kalichman, Simbayi, Vermaak, Jooste, & Cain, 2008). Recent literature in the United States (Bryant, 2006) and in Asia (Li, Li, & Stanton, 2009) indicates that current or recent alcohol use is associated with (a) behaviorally high levels of sexual impulsivity and frequent unsafe sexual activity; (b) deficits in self-management, social skills, and problem solving; and (c) impaired judgment about negotiating or using condoms and about involvement in high-risk sexual behaviors. Recently, Akarro (2008) reported that young Tanzanian female CSWs (aged 10-14 years old) who drink alcohol were 6.6 times less likely to use condoms than nondrinkers.

In the Philippines, the term *female bar worker* refers to a woman employed by an alcohol-serving establishment where sex may sometimes be negotiated. The term is preferred over the more stigmatic term *commercial sex worker*, and often the more euphemistic term *guest relations officer* is used. Although sex work is illegal in the Philippines, the government requires FBWs to be registered in a local social hygiene clinic (SHC). These SHCs are funded through the health departments. A network of SHCs provide STI testing and treatment for registered FBWs in over 140 cities, with some sites screening more than 1,000 women per week (Wi et al., 2006). The Filipino government also has focused efforts on collaborations with sex establishments, local authorities, and health departments to establish and promote the 100% condom use campaign.

This study was guided by community-based participatory research (CBPR) principles (Hergenrather & Rhodes, 2008; Israel et al., 2003; Reece & Dodge, 2004; Rhodes & Benfield, 2006; Rhodes, Malow, & Jolly, this issue), including multidirectional and colearning, and shared ownership of, and equal participation in, the research process among lay community members (including bar owners, FBWs, and customers), organizational representatives, and academic researchers from the United States and the Philippines. Although most research on female CSWs in developing countries has focused on the more visible street-based CSWs (Remple, Johnson, Patrick, Tyndall, & Jolly, 2007), this article details this collaborative effort using a CBPR framework in which the collective knowledge, perspectives, experiences, and resources of these diverse partners, representing a broad spectrum of community stakeholders, helped guide the development, implementation, and evaluation of the interventions designed to reduce HIV risk among FBWs.

## CONCEPTUAL FRAMEWORK

Research evidence consistently suggests that the link between HIV risk and alcohol use is a complex interaction between individual (e.g., the individual's personal knowledge, attitudes, and skills) and situational factors (e.g., the social norms and expectations that are beyond the individual level (Lightfoot & Milburn, 2009; Shahmanesh, Patel, Mabey, & Cowan, 2008). Thus, this study was designed to compare three conditions that intervened on these factors using various approaches: (a) a peer-educator intervention, (b) a manager-training intervention, and (c) a combination peer-educator and manager-training intervention to each other and to a usual care or nonintervention condition. We compared the four conditions using a quasi-experimental design with statistical adjustment to control for possible demographic and other confounding factors (Morisky, Stein, Chiao, Ksobiech, & Malow, 2006). Members of our CBPR partnership shared relatively equal roles in helping to develop and implement each of the interventions and evaluate the study.

## METHODS

### COMMUNITY-BASED PARTICIPATORY RESEARCH

Complex health problems, particularly those that affect vulnerable populations such as CSWs who tend to be marginalized socially, economically, and politically, have been noted to be ill-suited for traditional “outside-expert” approaches to research and practice that often result in ineffective interventions (Rhodes et al., 2007). Research aimed at promoting community health has begun to focus attention on community-academic partnerships as integral elements in the research enterprise (Eng et al., 2005; Green, 2001; Institute of Medicine, 2003; Israel, Schulz, Parker, & Becker, 1998; Urada, Thomas, Morisky, & Malow, 2008).

CBPR is designed to ensure participation by members from the communities affected by the issue being studied; representatives of community-based organizations (CBOs) and nongovernmental organizations (NGOs) and agencies; health care providers; and researchers and practitioners in all aspects of research. CBPR ensures that (a) bridges are created and trust built among community members, organizational representatives, and academic researchers; (b) research is authentic to community structures and community member experiences; (c) research questions are relevant; (d) research design and methods are culturally congruent; (e) knowledge yields action; (f) research informs policy; and (g) infrastructure is built to promote long-term sustainability when appropriate (Rhodes et al., 2006). Through CBPR, community-academic partnerships can enhance the quality, interpretation, relevance, and use of data and ensure appropriate dissemination of study findings (Cashman et al., 2008; Green, 2001; Institute of Medicine, 2003; Israel et al., 1998; Rhodes & Benfield, 2006). This study was guided by CBPR partnership comprising community members, organizational representatives, and academic researchers, each of whom has made a commitment to partnership principles, including multidirectional and colearning, and shared ownership of, and equal participation in, the research process among members of a research team and community stakeholders, including bar owners, FBWs, and customers, to explore, and work toward action to meet, the needs of FBWs.

### NEEDS ASSESSMENT

To develop intervention approaches and content, our CBPR partnership first conducted a needs analysis in each community where the interventions were to be administered (four sites located in noncontiguous islands in the southern Philippines). These sites were chosen because there was an absence of prior HIV research activities in these regions despite HIV being a community priority; this also made it less likely that contaminating factors might confound the outcome and the interpretation of the findings from this study.

A co-investigator (TVT) also had established excellent ongoing collaborative relationships with the regional health officers of each study region, as well as the city health officers within each region. Partnerships were further developed between the city health officers and participating establishments and community stakeholders (Urada et al., 2008).

### IN-DEPTH INTERVIEWS

In-depth interviews with key informants, including regional and city health officials, managers and owners of establishments, FBWs, SHC personnel, and staff from pharmacies and NGOs were completed by educators from the local School of Nursing. These interviewers were trained by members of the CBPR partnership in interviewing techniques using the interviewer's guide (which the CBPR partnership developed and revised using an iterative approach and approved by consensus), techniques to build trust with interviewees from vulnerable communities, and human subject protection. All interviews were conducted

in safe locations in the community. These interviews were used to explore perceptions on sexual risk and the influence of alcohol use on risk within the context of bars. Questions explored the types of beverage consumed by FBWs (e.g., “ladies’ drinks” that generally are nonalcoholic fruit juices versus beer), amount of alcohol beverage consumed by customers and FBWs, perceived role of alcohol in sexual risk, consumption of food (to reduce the effects of alcohol consumed), and access to, and perceptions about, condoms. The interviews also explored intervention implementation approaches and content areas. An ad hoc subcommittee of the CBPR partnership analyzed these in-depth interview data using an abbreviated grounded theory approach (Glaser & Strauss, 1967) to identify themes to inform intervention approaches and content.

## INTERVENTION SELECTION AND MEASUREMENT

Guided by the findings from key informant interviews, we identified peer education and manager training as the two most promising intervention approaches based on three partnership-defined priorities: reduce the sexual risk of FBWs, reach large numbers of FBWs, and facilitate sustainability within communities after the study has completed. We developed three interventions: a peer-educator intervention, a manager-training intervention, and a combination peer-educator and manager-training intervention. Our partnership chose to compare these interventions with one another and to a usual care or nonintervention condition; we chose this study design to build evidence of successful approaches to curb HIV infection rates within alcohol-serving establishments.

Interview findings also informed the development of a questionnaire to be administered to FBWs within the establishments. This questionnaire served as the basis for evaluating the interventions based on intervention content. The questionnaire included demographic variables, cognitive variables, intervention process-related variables, and behavioral outcome variables.

Demographic variables assessed included age, education, work duration, weekly wage, and partner status. Cognitive variables included HIV knowledge and self-esteem. HIV knowledge was the summed number of correct responses to a series of nine yes/no questions about the HIV transmission, prevention, and treatment (Morisky, Stein, et al., 2002). We used a combination of the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and Kaplan's Self-Derogation Scale (Kaplan, 1973) with a Likert scale (strongly agree [1] to strongly disagree [5]).

Intervention process-related variables included whether the FBW attended a regular establishment meeting and whether condom use rules and regulations had been discussed during the establishment meeting; whether the FBW had attended an HIV prevention class, felt the class was useful, and felt the class increased their own condom use; and whether the FBW had ever been taught to use condoms properly and taught to use condoms properly by a medical professional.

Manager-related variables included whether the manager ever attended a community HIV meeting, attended an HIV prevention class, or implemented an HIV prevention class for FBWs.

Two behavioral outcomes were assessed: HIV and STI testing and receiving one's results and consistent condom use. Testing data were abstracted from SHC records to ascertain whether FBWs had been tested for HIV/STIs in the past 6 months. Consistent condom use was assessed via self-report using a validated six-item scale (Morisky, Ang, & Sneed, 2002) with an alpha of .82. Sample scale items included “If a customer does not bring a condom, how often do you ask him to use one?” and “How often do you have sex without a condom

so you can make more money?” A 5-point Likert interval was used; and items were reverse-coded as warranted, with higher scores reflecting more consistent condom use.

Data were collected through a structured face-to-face interview administered by trained field workers. Institutional review board approval was obtained from the University of the Philippines, College of Public Health, and the University of California, Los Angeles.

## DATA ANALYSIS

Descriptive statistics summarized demographic variables. Potential differences between conditions were assessed using chi-square tests for categorical variables and *F* tests for continuous variables. Multivariable logistic regression model using a generalized linear mixed modeling was used to test differences among conditions while adjusting for baseline scores, individual background variables (i.e., age, education, work duration, weekly wage, and partner status), and within-establishment clustering. All analyses were performed in Stata, Version 9.0 SE, software. All regression models adjust for the clustering of multiple FBWs employed at the same establishment.

## PARTICIPANT RECRUITMENT, TRAINING, AND INTERVENTION IMPLEMENTATION

**FBW Peer Educator and Manager Recruitment**—FBWs, trained to serve as peer leaders, were either recommended by the establishment manager and volunteered or volunteered themselves to be trained as peer educators. Members from the CBPR partnership met with each establishment manager to introduce the goal and objectives of the study and intervention in each community. All managers in each participating community agreed to join the training program. During this recruitment process, managers also identified the importance of including floor supervisors in each establishment, given their interaction with both FBWs and customers.

**Training**—The CBPR partnership used an iterative approach to develop the peer education and manager trainings that included developing learning objectives, activities, and evaluating process measures for each training session. The training was designed to be interactive and included role-playing to develop and practice communication skills, how to teach condom negotiation skills to others, and how to talk about sensitive issues, and developing educational materials to display in the establishments.

The managers also were trained to positively reinforce organizational policy through informal interactions with FBWs and establishment meetings; the provision of free condoms to the FBWs and customers; enforcement of the 100% condom use rule; ongoing instruction in proper condom use among FBWs; and facilitating the registration and attendance of regularly scheduled STI testing of FBWs at local SHCs.

Participant trainings were held in local hotels conveniently located within each targeted city. This included training two FBWs from each of 20 establishments as peer educators ( $N = 40$ ) in Legaspi City; managers ( $N = 46$ ) and floor supervisors ( $N = 87$ ) in Cagayan de Oro; and FBWs ( $N = 120$ ) and managers ( $N = 60$ ) and floor supervisors ( $N = 105$ ) in Cebu. Ilo-Ilo served as the usual care (nonintervention) community.

Training sessions lasted 6 hours each day for one week and included lectures, interactive skills building activities, role-playing, and discussion typical within a small group format. We also provided “booster” sessions for new and continuing FBWs who needed training and reinforcement. Travel allowances and a daily stipend were provided to defray expense and lost work time.

**Intervention Implementation**—In accordance with our CBPR approach, we began with a preintervention phase in each intervention community to nurture and further develop an ongoing collaborative relationship with the community. Members from our CBPR partnership held monthly meetings with city health officials, SHC staff, nurses and midwives, sanitation inspectors, medical technologists, and recording clerks at the four regional study sites. These meetings allowed for partners to refine the study design, determine best methods for data collection and intervention implementation, and finalize the trainings.

After they were trained, we conducted monthly implementation meetings with peer educators and managers and supervisors in each intervention community. In these meetings they discussed challenges they faced in providing peer education or manager trainings to FBWs, problem solved, refined their skills, and identified local resources to support risk reduction. For example, peer educators and managers learned of, and planned collaborative efforts with local AIDS-related NGOs that could help facilitate the prevention activities with FBWs.

Our CBPR partnership also encouraged the development of unique and culturally congruent prevention messages. FBWs from intervention communities worked together to develop several high quality low literacy educational materials, consisting of posters, brochures, and stickers posted in the establishment and SHC. For motivational purposes, FBWs won prizes (e.g., hygiene kits, beauty aids, purses, handkerchiefs, movie theater tickets, meals and restaurant vouchers, etc.) for their educational materials that were displayed in the establishment. These materials were designed to serve as “cues to action” to use condoms and triggers for discussion among FBWs and customers. These prizes were provided by local businesses in the community that were involved with as either a member or peripherally in our CBPR partnership.

## **SAMPLE**

This study included all FBWs who were employed at the establishments that had enrolled peer educators and/or managers/supervisors as well as FBWs working within establishments recruited to participate in the control condition. All FBWs were included in this analysis except those who reported having no sex with their establishment-based customers, which amounted to 20% of the original study group. FBWs who failed to provide key information about their condom use behaviors and daily alcohol consumption were excluded from the current analyses. This amounted to less than 5% of the original study group. This procedure yielded a total of 911 FBWs at posttest.

## **RESULTS**

### **DEMOGRAPHICS**

The 911 FBW study participants averaged 23.5 years old (range 15–54), 8.96 years of education, and 12.47 months of commercial sex work employment at their current establishment. Among the FBWs, 8% reported being married, with 55.3% reporting at least one child. Average weekly income from their work in the establishment was 1,372.5 pesos (approximately U.S.<sup>2</sup>50).

### **BEHAVIORAL OUTCOMES**

Table 1 presents the distributions of the two behavioral outcomes by intervention condition at 2-year follow-up. Among the four conditions, over 90% of FBWs in the combined peer-educator and manager-training condition had, and received results from, HIV and STI testing in the past 6 months and were informed of their results, compared with about 85% of



FBWs in the peer-education condition, 85% in the manager-training condition, and 51% in the control condition. FBWs in the combined condition were significantly more likely to consistently use condoms than the other conditions.

## INTERVENTION TARGETED VARIABLES

Table 2 presents condition differences by cognitive variables, intervention process-related variables, and manager-related variables. Among the four groups, FBWs in the intervention conditions had significantly higher levels of HIV knowledge than those in the control condition. FBWs in the manager training and the combined peer-educator and manager-training intervention conditions also had higher levels of self-esteem than those in the control condition.

A greater proportion of FBWs in the combined peer-educator and manager-training condition attended regular meetings and were more likely to report discussing condom use rules and regulations in these meetings compared with the control condition. FBWs in the combined peer-educator and manager-training condition were found to be most likely to attend an HIV prevention class (46%) and reported that the class increased their consistent condom use (42%). Over 70% of FBWs in the manager training condition and the combined peer-educator and manager-training condition reported being taught to use condoms properly, and over 60% reported being taught by medical professionals.

Managers of FBWs in all three intervention conditions were significantly more likely to participate in HIV prevention-related activities than those in the control conditions. More than 80% of the managers in the combined peer-educator manager-training condition reported attending a community HIV meeting or an HIV prevention class while only about 60% of the managers in the control condition reported attending a community HIV meeting and less than 45% attended an HIV prevention class.

## SEXUAL AND PROTECTIVE PRACTICES

Tables 3 and 4 present intervention-related variables separately for each group with regard to HIV and STI testing and consistent condom use, respectively. Adjusting for individual demographic characteristics (age, education, work duration, weekly wage, and partner status), knowledge and self-esteem did not significantly increase the likelihood of HIV and STI testing (see Table 3). Several intervention process-related variables were found to be significantly associated with HIV and STI testing. FBWs in the control condition were significantly more likely to report HIV and STI testing if they also reported attending a prevention class, felt that the attended prevention class increased their own condom use, or had been taught to use condoms properly, particularly by medical professionals. Managers seemed to positively influence HIV and STI testing among FBWs in the control condition but not significantly.

Consistent condom use was positively associated with various cognitive characteristics, intervention process-related variables, and manager-related variables (see Table 4). For FBWs in the combined peer-educator manager-training condition, the significant factors were higher levels of HIV knowledge, attending an HIV prevention class, and knowledge of proper condom use. Managers of FBWs in the control group who offered an HIV prevention class for FBWs significantly increased consistent condom use among FBWs.

## DISCUSSION

The results from the intervention study suggest that a well-structured community-based, natural helping intervention that builds on and combines both peer-education and manager-training can increase HIV and STI testing and condom use among FBWs. Evaluation data

from this study support the effectiveness of the combined intervention that our CBPR partnership developed to increase HIV and STI testing and condom use. Although the peer-education and manager-training interventions increased HIV and STI testing, when comparing the four conditions, the combined peer-education and manager-training intervention was the only intervention to increase both HIV and STI testing and consistent condom use significantly. The other conditions did not increase consistent condom use.

Another intervention study, which was implemented to reduce risk among CSWs in La Paz, Bolivia, had similar results. The intervention combined STI testing and behavior change components (e.g., condom use). STI prevalence among the CSWs ( $N = 508$ ) declined significantly during the three-year study period, supporting the use of NGOs as coordinators of HIV prevention interventions and implementers of public health services, particularly in areas where HIV rates are still low (Levine et al., 1998).

Wi et al. (2006) also administered a similar intervention in the Philippines aimed at reducing STIs among female CSWs via presumptive treatment for the first intervention condition and improved prevention and screening services for the second intervention condition. The results indicated significant declines of STIs for all groups. However, at 6-month follow-up, STI prevalence remained low for the improved prevention and screening services condition but reverted to preintervention levels for the presumptive treatment condition, reinforcing a common theme: HIV and STI control requires ongoing access to effective preventive modalities (e.g., access to condoms and skills building) coupled with structural intervention risk reduction (e.g., establishment rules and regulations).

Shahmanesh et al., (2008) reviewed 28 HIV prevention interventions for female CSWs and found strong evidence supporting the implementation of multicomponent interventions that include sexual risk reduction workshops, condom promotion, and improved access to STI testing and treatment to reduce HIV and STI acquisition among CSWs. They also found that empowerment of CSWs, policy changes, and structural interventions also reduced the prevalence of HIV and STIs. However, to effectively implement multi-level CBPR interventions targeting FBWs, for example, commitment from establishment managers is typically necessary. Simply providing peer education and clinical counseling may be insufficient in sustaining desired outcomes. The results from a recent randomized clinical trial (Hoke et al., 2007) also support our present findings, suggesting that organizational policy (e.g. consistent condom use or 100% condom use rules) within the establishments are best achieved when designed, implemented, refined, and executed by managers and supervisors who are part of the community, involved in community activities, and more likely to be seen as credible. Such policies are more likely to be enforced because those who are responsible for enforcement have “bought into” the policy. This is also supported by Kerrigan et al. (2006), whose results indicated the importance of multilevel interventions that are informed by community stakeholders and combine both individual and structural approaches.

## REFLECTIONS ON THE USE OF CBPR

In this study, we used a CBPR approach that included community members, organizational representatives, and academic researchers to design, implement, and evaluate the interventions. It seems clear that this type of partnership approach to research yielded interventions that were culturally congruent and highly acceptable to a broad spectrum of stakeholders, including: FBWs, establishment managers, floor supervisors, and customers. Coupled with their being informed by sound science and established health behavior theory, the developed interventions were as “informed” as possible. The approach also ensured that data collection methodologies were realistic to yield more valid and reliable data. Often in less community-partnered research, academic researchers have the scientific knowledge but



lack the knowledge of how their perhaps innovative ideas will play out in a real-world context. For example, collecting data from a random sample of FBWs would not have been possible although such an approach would be a research design textbook standard; thus, the study design used to test and compare the interventions was authentic.

Furthermore and perhaps even more important, this CBPR partnership was able to move beyond the study and the evaluated interventions toward meeting further community priorities and needs. For example, when meeting with FBWs, managers discovered that because of the high cost of prescription medication (as much as 2½ days of salary wages) FBWs would purchase only one or two doses and not the entire necessary 10-day treatment regimen. This resulted in the temporary removal of symptoms and a negative clinical examination, allowing FBWs with STIs to return to work. However, owing to incomplete removal of bacterial infection, a recurrent STI resulted in about 2 weeks. Managers working collaboratively with the CBPR partnership designed an “insurance fund” to be available for FBWs to borrow an amount to pay for the entire prescription and repay the loan with small interest to sustain the fund. This may reduce recidivism rates among FBWs with STIs and illustrates the impact of a highly committed CBPR partnership with various perspectives, skills, and resources to innovate.

Another study outcome was an ongoing annual commemoration of World's AIDS Day in which FBWs and managers organize community marches through the streets of their communities to raise awareness about HIV and the annual World's AIDS Day theme. FBWs who participated in this study mobilized and collaborated with key members of the CBPR partnership (e.g., SHC personnel and NGO representatives) to initiate and organize these marches. These marches have provided opportunities to increase HIV awareness, fight prejudice, and improve educational counseling and screening, and raise funds for their efforts.

The long-term impact of this study is evident in the ongoing meetings of the CBPR partnership, continued support of SHC registration and regular FBWs clinic visits, and the annual World AIDS Day commemoration. Throughout Southeast Asia, other health agencies and commercial establishments reference the success of this program and use our model of community collaboration to help inform their policies and practices (Foss, Hossain, Vickerman, & Watts, 2007; Ortega, Bicaldo, Sobritchea, & Tan, 2005).

In Table 5, we outline some abbreviated and refined CBPR concepts (Israel et al., 2003) and how our CBPR partnership operationalized them within this study. We posit that our project was successful to a large extent due to our careful and critical adherence to these CBPR concepts.

## LIMITATIONS

The use of self-reports to measure sensitive outcome behavior, such as condom use, may be subject to error through a social desirability bias. However, no significant differences in social desirability were found among those reporting always or very often using condoms and those reporting using condoms less frequently (Morisky, Ang, Coly et al., 2002). Further research is recommended on quantifying sexual behaviors to provide more reliable and valid measures. For example, how individuals, particularly CSWs define partners (e.g., “primary,” “secondary,” “regular customer,” “husband,” etc) may affect self-reported condom use. Another potential bias in this study is the possibility of preexisting site differences. However, considerable care was taken to select representative and comparable communities in the southern Philippines and randomly assign intervention approaches to each community.

## CONCLUSIONS

Although further rigorous research would be helpful, multiple studies document the value of going beyond individual-level interventions to incorporate community stakeholders and other influences at the institutional, organizational, and governmental levels to support health changes and to reduce rates of HIV and STIs (Chiao & Morisky, 2007; Chiao, Morisky, Ksobiech, & Malow, 2009; Kerrigan et al., 2006; Morisky, Ang, Coly, & Tiglao, 2004; Morisky et al., 2006; Morisky et al., 2002). As Fang et al. (2007) suggested, including other community network members (e.g., friends, family, employers, community and other organizations, and institutions) in future intervention designs may well improve the likelihood of achieving desired outcomes.

Moreover, it has been suggested that the most successful interventions to prevent HIV may need to be based on responding to immediate community priorities and needs while building capacity for communities to act on their own behalf (Gupta, Parkhurst, Ogden, Aggleton, & Mahal, 2008). Our CBPR approach did just that; its focus and approach came from the community and it provided key skills (e.g., communication, problem solving, leadership, social support) that may be lifelong and transferable to other community concerns.

## Acknowledgments

The study was funded by the National Institutes of Allergy and Infectious Diseases (Grant R01-AI33845), UCLA AIDS (Grant AI-28697), and University-wide AIDS Research (Grant D04-LA-400). The authors extend appreciation to Dr. Chi Chiao, associate professor, National Yang-Ming University, for data analytical assistance; research manager Charlie Mendoza, and site coordinators Dorcas Romen, Grace Carungay, Angelica Mallari, Mildred Publico, and Grace Ong.

## REFERENCES

- Akarro RR. Some factors associated with condom use among bar maids in Tanzania. *Journal of Biosocial Science*. 2008; 41:125–137. [PubMed: 18442433]
- Bryant KJ. Expanding research on the role of alcohol consumption and related risks in the prevention and treatment of HIV/AIDS. *Substance Use and Misuse*. 2006; 41:1465–1507. [PubMed: 17002990]
- Cashman SB, Adeky S, Allen AJ III, Corburn J, Israel BA, Montano J, et al. The power and the promise: Working with communities to analyze data, interpret findings, and get to outcomes. *American Journal Public Health*. 2008; 98:1407–1417.
- Chiao C, Morisky DE. The role of a regular sex partner in sexually transmitted infections and reinfections: Results from the study of female entertainment establishment workers in the Philippines. *Sexually Transmitted Diseases*. 2007; 34:534–540. [PubMed: 17710751]
- Chiao C, Morisky DE, Ksobiech K, Malow RM. Promoting HIV testing and condom use among Filipina commercial sex workers: Findings from a quasi-experimental intervention study. *AIDS and Behavior*. 2009; 13:892–901. [PubMed: 18543095]
- Cohen DA, Wu SY, Farley TA. Structural interventions to prevent HIV/sexually transmitted disease: Are they cost-effective for women in the southern United States? *Sexually Transmitted Diseases*. 2006; 33:S46–S49. [PubMed: 16794555]
- Eng, E.; Moore, KS.; Rhodes, SD.; Griffith, D.; Allison, L.; Shirah, K., et al. Insiders and outsiders assess who is “the community”: Participant observation, key informant interview, focus group interview, and community forum.. In: Israel, BA.; Eng, E.; Schulz, AJ.; Parker, E., editors. *Methods for conducting community-based participatory research for health*. Jossey-Bass; San Francisco: 2005. p. 77-100.
- Fang X, Li X, Yang H, Hong Y, Zhao R, Dong B, et al. Profile of female sex workers in a Chinese county: does it differ by where they came from and where they work? *World Health and Population*. 2007; 9(1):46–64. [PubMed: 18270499]

- Foss AM, Hossain M, Vickerman PT, Watts CH. A systematic review of published evidence on intervention impact on condom use in sub-Saharan Africa and Asia. *Sexually Transmitted Infection*. 2007; 83:510–516.
- Glaser, BG.; Strauss, AL. *The discovery of grounded theory: Strategies for qualitative research*. Aldine; Chicago: 1967.
- Green LW. From research to “best practices” in other settings and populations. *American Journal of Health Behavior*. 2001; 25:165–178. [PubMed: 11322614]
- Gupta GR, Parkhurst JO, Ogden JA, Aggleton P, Mahal A. Structural approaches to HIV prevention. *The Lancet*. 2008; 372:764–775.
- Hergenrather, KC.; Rhodes, SD. Community-based participatory research: Applications for research in health and disability.. In: Knoll, T., editor. *Focus on disability: Trends in research and application*. Vol. 2. Nova Science; New York: 2008. p. 59-87.
- Hoke TH, Feldblum PJ, Van Damme K, Nasution MD, Grey TW, Wong EL, et al. Temporal trends in sexually transmitted infection prevalence and condom use following introduction of the female condom to Madagascar sex workers. *International Journal of STD and AIDS*. 2007; 18:461–466. [PubMed: 17623503]
- Inciardi JA, Surratt HL, Kurtz SP. HIV, HBV, and HCV infections among drug-involved, inner-city, street sex workers in Miami, Florida. *AIDS and Behavior*. 2006; 10:139–147. [PubMed: 16378168]
- Institute of Medicine. *Unequal treatment: Confronting racial and ethnic disparities in health care*. National Academy Press; Washington, DC: 2003.
- Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: Assessing partnership approaches to improve public health. *Annual Review of Public Health*. 1998; 19:173–202.
- Israel, BA.; Schulz, AJ.; Parker, EA.; Becker, AB.; Allen, AJ.; Guzman, R. Critical issues in developing and following community-based participatory research issues.. In: Minkler, M.; Wallerstein, N., editors. *Community-Based Participatory Research for Health*. Jossey-Bass; San Francisco: 2003. p. 53-76.
- Kalichman SC, Simbayi LC, Vermaak R, Jooste S, Cain D. HIV/AIDS risks among men and women who drink at informal alcohol serving establishments (Shebeens) in Cape Town, South Africa. *Prevention Science*. 2008; 9:55–62. [PubMed: 18264762]
- Kaplan HB. Self-derogation and social position: Interaction effects of sex, race, education, and age. *Social Psychiatry and Psychiatric Epidemiology*. 1973; 8:92–99.
- Kerrigan D, Moreno L, Rosario S, Gomez B, Jerez H, Barrington C, et al. Environmental-structural interventions to reduce HIV/STI risk among female sex workers in the Dominican Republic. *American Journal of Public Health*. 2006; 96:120–125. [PubMed: 16317215]
- Larios SE, Lozada R, Strathdee SA, Semple SJ, Roesch S, Staines H, et al. An exploration of contextual factors that influence HIV risk in female sex workers in Mexico: The Social Ecological Model applied to HIV risk behaviors. *AIDS Care*. 2009; 21:1335–1342. [PubMed: 19370470]
- Levine WC, Revollo R, Kaune V, Vega J, Tinajeros F, Garnica M, et al. Decline in sexually transmitted disease prevalence in female Bolivian sex workers: Impact of an HIV prevention project. *AIDS*. 1998; 12:1899–1906. [PubMed: 9792391]
- Li Q, Li X, Stanton B. Alcohol use and sexual risk behaviors and outcomes in China: A literature review. *AIDS and Behavior*.. 2009 Published online: 05 December, 2009. DOI 10:1007/s10461-009-9648-5.
- Lightfoot MA, Milburn NG. HIV prevention and African American youth: Examination of individual-level behaviour is not the only answer. *Culture, Health and Sexuality*. in press.
- Morisky DE, Ang A, Coly A, Tiglaio TV. A model HIV/AIDS risk reduction programme in the Philippines: A comprehensive community-based approach through participatory action research. *Health Promotion International*. 2004; 19:69–76. [PubMed: 14976174]
- Morisky DE, Stein JA, Chiao C, Ksobiech K, Malow R. Impact of a social influence intervention on condom use and sexually transmitted infections among establishment-based female sex workers in the Philippines: A multilevel analysis. *Health Psychology*. 2006; 25:595–603. [PubMed: 17014277]

- Morisky DE, Stein JA, Sneed CD, Tiglaio TV, Liu K, Detels R, et al. Modeling personal and situational influences on condom use among establishment-based commercial sex workers in the Philippines. *AIDS and Behavior*. 2002; 6:163–172.
- Ortega NL, Bicaldo BF, Sobritchea C, Tan ML. Exploring the realities of HIV/AIDS-related discrimination in Manila, Philippines. *AIDS Care*. 2005; 17:S153–S164. [PubMed: 16174626]
- Reece M, Dodge B. A study in sexual health applying the principles of community-based participatory research. *Archives of Sexual Behavior*. 2004; 33:235–247. [PubMed: 15129042]
- Remple VP, Patrick DM, Johnston C, Tyndall MW, Jolly AM. Clients of indoor sex workers: heterogeneity in patronage patterns and implications for HIV and STI propagation through sexual networks. *Sexually Transmitted Diseases*. 2007; 34:754–760. [PubMed: 17507836]
- Rhodes, SD.; Benfield, D. Community-based participatory research: An introduction for the clinician researcher.. In: Blessing, JD., editor. *Physician assistant's guide to research and medical literature*. 2nd ed.. Davis; Philadelphia: 2006. p. 105-118.
- Rhodes SD, Eng E, Hergenrather KC, Remnitz IM, Arceo R, Montano J, et al. Exploring Latino men's HIV risk using community-based participatory research. *American Journal of Health Behavior*. 2007; 31:146–158. [PubMed: 17269905]
- Rhodes SD, Hergenrather KC, Montano J, Remnitz IM, Arceo R, Bloom FR, et al. Using community-based participatory research to develop an intervention to reduce HIV and STD infections among Latino men. *AIDS Education and Prevention*. 2006; 18:375–389. [PubMed: 17067250]
- Rosenberg, M. *Society and the adolescent self-image*. Princeton University; Princeton, NJ: 1965.
- Shahmanesh M, Patel V, Mabey D, Cowan F. Effectiveness of interventions for the prevention of HIV and other sexually transmitted infections in female sex workers in resource poor setting: A systematic review. *Tropical Medicine and International Health*. 2008; 13:659–679. [PubMed: 18266784]
- Urada, L.; Thomas, T.; Morisky, DE.; Malow, RM. An expanded community-based HIV prevention program in the Philippines.. In: Stanton, B.; Galbraith, J.; Kaljee, L., editors. *The uncharted path from clinic-based to community-based research*. Nova; New York: 2008. p. 87-104.
- Vuttanont U, Greenhalgh T, Griffin M, Boynton P. “Smart boys” and “sweet girls” —sex education needs in Thai teenagers: A mixed-method study. *The Lancet*. 2006; 368:2068–2080.
- Wi T, Ramos ER, Steen R, Esguerra TA, Roces MC, Lim-Quizon MC, et al. STI declines among sex workers and clients following outreach, one time presumptive treatment, and regular screening of sex workers in the Philippines. *Sexually Transmitted Infections*. 2006; 82:386–391. [PubMed: 17012514]

TABLE 1

Percentage Having STI Test and Mean (Standard Deviation) of Consistent Condom Use by Intervention Condition at Follow-Up

	Legaspi: Peer Education (n = 150)	Cagayan de Oro: Manager Training (n = 202)	Cebu: Combined (n = 418)	Ilo-Ilo: Control (n = 141)	Statistical Test
Had, and received results of, HIV/STI test in past 6 months (%)	85.33	84.65	93.78	51.06	$\chi^2(3) = 120.04; p < .000$
Consistent condom use (never [0]-always [5])	1.61 (1.24)	1.79 (1.26)	3.04 (1.87)	1.70 (0.97)	$F = 51.07 p < .000$

Note. STI – sexually transmitted infection. Tests for difference conducted using  $\chi^2$  tests for categorical variables and  $F$ -tests for continuous variables.



TABLE 2

Mean (Standard Deviation) or Percentage of Individual Cognitive Variables, Process-Related Variables, and Manager-Related Variables by Intervention Condition

	Legaspi: Peer Education (n = 150)	Cagayan de Oro: Manager Training (n = 202)	Cebu: Combined (n = 418)	Ilo-Ilo: Control (n = 141)	Statistical Test
Cognitive variables					
HIV knowledge (0-9)	6.98 (1.29)	6.31 (1.45)	6.80 (1.39)	5.90 (1.43)	$F = 21.21; p < .000$
Self-esteem (10-50)	32.79 (4.68)	34.68 (3.47)	34.57 (4.08)	32.60 (3.91)	$F = 14.83; p < .000$
Intervention process-related variables					
Attended a regular establishment meeting (%)	71.33	85.15	94.74	85.11	$\chi^2(3) = 54.17; p < .000$
Discussed establishment condom use rules/regulations in the meeting (%)	5.33	31.19	55.74	36.17	$\chi^2(3) = 146.53; p < .000$
Attended an HIV prevention class (%)	42.67	28.22	45.69	27.66	$\chi^2(3) = 26.79; p < .000$
Felt that attended prevention class was useful (%)	98.00	96.04	92.58	76.60	$\chi^2(3) = 47.08; p < .000$
Felt that the attended prevention class increased their own condom use (%)	6.67	24.26	42.11	14.89	$\chi^2(3) = 97.10; p < .000$
Ever been taught to use condoms properly (%)	64.00	78.71	75.36	58.87	$\chi^2(3) = 22.84; p < .000$
Taught proper condom use by medical professionals (%)	40.67	65.35	61.00	41.13	$\chi^2(3) = 38.24; p < .000$
Manager-related variables					
The manager ever:					
Attended a community HIV meeting (%)	60.67	65.35	82.30	59.57	$\chi^2(3) = 47.20; p < .000$
Attended an HIV prevention class (%)	72.67	63.86	88.76	43.97	$\chi^2(3) = 123.02; p < .000$
Implemented an HIV prevention class for workers (%)	57.33	85.15	79.67	12.06	$\chi^2(3) = 258.39; p < .000$

Note. Tests for difference conducted using  $\chi^2$  tests for categorical variables and  $F$ -tests for continuous variable.

TABLE 3

Predicting Odds of Having an HIV/STI Test of FBWs by Intervention Condition

	Legaspi: Peer Education ( <i>n</i> = 150)	Cagayan de oro: Manager Training ( <i>n</i> = 202)	Cebu: Combined ( <i>n</i> = 418)	Ilo-Ilo: Control ( <i>n</i> = 141)
	AOR	AOR	AOR	AOR
Cognitive variables				
HIV knowledge (ref = low)	1.14	1.32	1.07	1.51
Self-esteem (ref = low)	1.06	1.07	0.99	1.08
Intervention process-related variables				
Attended a regular establishment meeting (ref = no)	3.96**	2.89**	0.51	0.84
Discussed establishment condom use rules/regulations in the meeting (ref = no)	1.05	2.17	1.50	1.64
Attended a prevention class (ref = no)	4.32	2.07	1.24	20.42**
Felt that attended prevention class was useful (ref = no)	3.31	1.02	2.77	0.82
Felt that the attended prevention class increased their own condom use (ref = no)	1.60	0.92	2.16*	2.88*
Ever been taught to use condoms properly (ref = no)	1.65	3.43*	2.33	12.03***
Taught proper condom use taught by medical professionals (ref = no)	2.63	2.09	1.55	44.53**
Manager-related variables				
The manager ever:				
Attended a community HIV meeting (ref = no)	2.58	1.61	1.23	2.94
Attended an HIV prevention class (ref = no)	0.44	1.11	0.34	5.65
Implemented an HIV prevention class for workers (ref = no)	1.95	0.84	0.45	1.41

Note. STI – sexually transmitted infection; FBWs – female bar workers; AOR: adjusted odds ratio.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

TABLE 4

## Predicting Consistent Condom Use of FBWs by Intervention Condition

	Legaspi: Peer Education ( <i>n</i> = 150)	Cagayan de oro: Manager Training ( <i>n</i> = 202)	Cebu: Combined ( <i>n</i> = 418)	Ilo-Ilo: Control ( <i>n</i> = 141)
	Coef.	Coef.	Coef.	Coef.
Cognitive Variables				
HIV knowledge (ref = low)	-0.09	-0.001	.19**	0.06
Self-esteem (ref = low)	-0.04	0.02	-0.06	0.02
Intervention process-related variables				
Attended a regular establishment meeting (ref = no)	.35*	-0.72	-0.18	0.12
Discussed establishment condom use rules/regulations in the meeting (ref = no)	-0.54	-0.40	0.21	0.07
Attended a prevention class (ref = no)	0.27	0.65	.53**	.96***
Felt that the attended prevention class was useful (ref = no)	.76*	.73*	-0.28	-0.04
Felt that the attended prevention class increased their own condom use (ref = no)	-0.25	0.09	1.49***	-0.10
Ever been taught to use condoms properly (ref = no)	.72*	.82***	1.29***	.85**
Proper condom use taught by medical professionals (ref = no)	1.00**	.57**	1.21***	1.02**
Manager-related variables				
The manager ever:				
Attended a community HIV meeting (ref = no)	0.13	0.28	0.37	0.16
Attended an HIV prevention class (ref = no)	-0.23	-0.27	0.20	0.36
Implemented an HIV prevention class for workers (ref = no)	-0.57	0.08	1.36*	-0.01

Note. FBWs – female bar workers.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

TABLE 5

## CBPR Concepts and Their Operationalization Within This Study

CBPR Concept	Implementation
Community members and researchers contribute equally and in all phases of research.	Partnership comprising community members, organizational representatives, and academic researchers had ongoing communication and held monthly meetings with managers and peer educators.
Trust, collaboration, shared decision making, and shared ownership of the research; findings and knowledge benefit all partners.	Worked closely as a partnership at the onset; monthly partnership meetings; continued training activities after the program ended
Researchers and community members recognize each other's expertise in multidirectional, colearning processes.	Shared decision making; transparent communication; blended sound science and health behavior theory, findings from the literature, and the real and lived experiences of community members (specifically FBWs)
Balance rigorous research and tangible community action.	Implementation of feasible and cost effective educational modalities to meet community priorities
Embrace skills, strengths, resources, and assets of community members and organizations.	Collected data explored community strengths and assets; intervention development was done iteratively by community members, organizational representatives, and academic researchers working shoulder to shoulder; established structures and processes for community voices to be heard and heeded.
Community is recognized as a unit of identity.	Interventions developed were based within existing social structures and were not artificial or contrived based on individual enrollment and randomization.
Emphasis is place on multiple determinants of health.	Combinations of educational learning opportunities were implemented; inclusion of peers, clients, and managers, and other environmental influences on risk; problem solving capacities were developed.
Partners commit to long-term research relationships.	Following this study, a similar program was implemented targeting male clients
Core elements include local capacity building, systems development, empowerment, and sustainability.	Diffusion of successful program components has been implemented in neighboring communities; interventions still very active in most of the original participating establishments; subsequent FBW-led initiatives have occurred (e.g., World AIDS Day marches).

*Note.* FBWs = female bar workers.