Published in final edited form as:

J Psychol Human Sex. 2005 ; 17(1-2): 45–63. doi:10.1300/J056v17n01_04.

Impact of Social and Structural Influence Interventions on Condom Use and Sexually Transmitted Infections Among Establishment-Based Female Bar Workers in the Philippines

Donald E. Morisky, ScD, ScM, MSPH,
University of California, Los Angeles, CA

Chi Chiao, MSc, MSPH,
University of California, Los Angeles, CA

Judith A. Stein, PhD, and
University of California, Los Angeles, CA

Robert Malow, PhD
Florida International University, Miami, FL

SUMMARY

This quasi-experimental study evaluated the influence of structural intervention components (e.g., changing organizational and social influence factors) in reducing biological sexually transmitted infections (STIs) and reports of unprotected sex among female bar workers (FBWs) in the Philippines (N = 369 at baseline). Recruited from four large southern Philippines cities, FBWs were exposed to a standard care, a manager influence, a peer influence, or a combined manager/peer influence condition. After the two-year intervention period, FBWs in the combined peer and manager intervention condition showed greater reductions in STIs and unprotected sex relative to those in the standard care condition. FBWs in the combined and the manager only conditions also showed a decrease in STIs compared to those in the standard care condition. Managers in the standard care condition reported lower positive condom attitudes and lower attendance at HIV/AIDS related training sessions compared to those in the combined condition. The combined effect of managers and peers had a positive, synergistic effect on condom use behavior and STI reduction compared to the standard care. This research provides empirical evidence that structural changes such as rules, regulations, and increased accessibility of condoms must be in combination with normative changes (individuals' attitudes, beliefs and normative expectancies) in order to achieve the greatest benefit in condom use behavior and STI reduction/prevention.

Keywords

Female bar workers; HIV/AIDS risk; structural intervention; STIs; condom use

In the Asian sex industry, commercial sex related activity has been transitioning outside of the brothel as legal pressures escalate and as customers perceive this pressure. Thus, increasing proportions of female sex workers are now operating in such venues as beer gardens, bars, nightclubs, karaoke TV centers, massage parlors, or disco dance

establishments (Hanenberg & Rojanapithayakorn, 1998; WHO, 2001), where they have become known as indirect sex workers or as female bar workers (FBWs).

The FBWs' lifestyle tends to be particularly distinctive from that of brothel based sex workers who are commonly referred to as commercial sex workers (CSWs). This is especially true in the realm of heterosexual relationships (Bloom et al., 2002). Unlike brothel-based CSWs, FBWs predominantly host or entertain male customers within the confines of the establishment by serving drinks, conversing or other similar activities. FBWs receive only small salaries and/or commissions based on quantity of drinks and food items which they serve. FBWs generally negotiate sexual activities inside the work establishment, which typically take place off-premise. If the negotiated off-premise activities do occur during "working hours," the patron is generally expected to pay a "bar fine" to the establishment's manager for any of the FBWs "leave-time."

The FBWs' compensation for this negotiated off-premise sex work tends to be much greater than the meager establishment wages and is perceived as necessary to support basic individual and family survival needs. Unfortunately, these negotiated outside sexual activities often expose FBWs to a extraordinary risk of STI/HIV as well as other dangers within unseemly, unsupervised and coercive environments in which the power and financial dynamics are unsupportive of safe sex activities. This is likely to contribute to the epidemic spread of STIs, particularly HIV through the direct effects of these activities and through acquiring ulcerative STI which facilitates HIV transmission (Davis & Weller, 1999; WHO, 2002). Indeed, recent surveillance data documents a markedly higher level of STI/HIV seroprevalence among FBWs relative to the general population. For instance, in Thailand HIV seroprevalence among FBWs averages six times higher than in the general female adult population (WHO, 2001).

Since the initial AIDS case was reported in 1984 in the Philippines, the country has witnessed relatively low rates of HIV, and continues to be classified as a "low level" area (UNAIDS, 2001). The Joint United Nations Program on HIV/AIDS reported that approximately 10,000 individuals were living with HIV/AIDS in the Philippines at the end of 2001, yielding an adult infection rate of approximately .06 percent. Heterosexual transmission accounted for almost two-thirds of cases, followed by sex between men and bisexual contact. Less than .5 percent of transmissions occurred through injecting drug use (UNAIDS, 2001).

For 10 major Philippine cities, sentinel surveillance was undertaken to assess HIV/AIDS seroprevalence among registered female sex workers (RFSW), freelance female sex workers (FLSW), men who have sex with men (MSM), and injecting drug users. However, due to relatively minute seroprevalence of IDUs, a sufficiently sized sample was not obtainable, despite using all sentinel sites. The primary findings indicated that infection rates remained minuscule (< 1%), even among high-risk groups with the greatest prevalence among RFSW, who showed an aggregate prevalence rate ranging from 0.07% to 0.2% collectively for all sites (WHO, 1999).

Several underlying dynamics have maintained a relatively low STI/HIV prevalence in the Philippines. According to a United Nations Development Program report (WHO, 2002), favorable factors include: (1) circumcision which reduces transmission; (2) a lack of land borders combined with many islands that discourage intermixing; (3) a sexually conservative culture; (4) the most popular illicit drugs (e.g., marijuana and methamphetamine) are not injected so HIV transmission through sharing injection equipment is reduced; (5) national, multisector policies conducive toward reducing HIV/AIDS; (6) effective educational and information dissemination campaigns; and (7)

comparative low numbers of sex partners among RFSW (2.5 per week in the Philippines vs. 4.5 per day in Thailand) (Morisky et al., 1998).

Commercial sex workers (CSWs), including those operating in brothel as well as non-traditional settings (e.g., bars, nightclubs, beer gardens) remain a priority group for STI/HIV prevention. Consistent with common beliefs, accumulating data support the contention that CSWs are contributing to the spread of HIV to heterosexuals (Reed, Ford, & Wirawan, 2001). As such, a burgeoning literature in this area has emerged regarding risk and protective factors for STI/HIV transmission (Sugihantono et al., 2003).

Established individual-level informational and attitudinal correlates of high risk behavior have been the focus of HIV prevention interventions. However, economic, organizational, legal and other macro-level structural factors have been increasingly emphasized in preventing HIV (Liu & So, 1996; Sumartojo, 2000). For example, reductions in HIV risk implemented by CSWs have been attributed to social-structural and external environmental determinants, such as workplace availability of condoms (Fontanet et al., 1998), policies mandating condom use between CSW and clients (Sedyaningsih-Mamahit, 1996), HIV education programs (Ford et al., 1996), and the support of establishment owners and managers (Morisky et al., 1998; 2002).

The emerging literature on macro-level structural factors has prompted studies such as the present one which seeks to examine various non-brothel settings (see above) where commercial sex is negotiated. Because this area of research is neglected, the aim is to develop a better understanding of commercial sex exchange in non-brothel settings to guide the design of more tailored interventions to specifically reduce risk in this context.

The interventions used in this community longitudinal study are based on a combination of two theoretical frameworks, social cognitive theory at the individual level and social influence theory at the organizational level. STI prevention requires individuals to exercise influence over their own behaviors and their social environment. To achieve self-directed change, individuals need to be equipped not only with heightened awareness and knowledge but also with the behavioral means, resources and social support. Bandura (1986) has conceptualized the basic ingredients of social cognitive theory to consist of personal determinants in the form of cognitive, affective, biological factors, behavior, and the environment. This theoretical framework was applied to HIV/AIDS-related behaviors by not only teaching safer sex guidelines, but also equipping individuals with skills and self-beliefs that enable them to put the guidelines consistently into practice in the face of counteracting influences (Bandura, 1994).

The second theoretical framework used in this research consists of power and social influence. The social psychological study of power and influence finds its origin in the groundbreaking work of Kurt Lewin (1941). He considered power the possibility of inducing force on someone else, or, more formally, as the maximum force person A can induce on person B divided by the maximum resistance that B can offer. This conceptualization of power and social influence was further developed by French and Raven (1959), who defined influence as a force one person (the agent) exerts on someone else (the target) to induce a change in the target, including changes in behaviors, opinions, attitudes, goals, needs, and values. Social power was subsequently defined as the potential ability of an agent to influence a target. Raven further classified the six bases of power to include reward, coercive, legitimate, referent, expert and informational power (Raven, 1965). In a recent study, women who perceived that they have more power or share power reported significantly higher rates of condom use compared to those who perceived that their partners have more power (Harvey et al., 2002).

METHODS

Interventions

Four large cities (pop. > 200,000) located approximately 250 miles south of the Philippine capital (Manila) were identified as potential intervention sites. All organizations unanimously agreed to participate in the longitudinal study and were informed that they could have been assigned to an intervention group or a standard control group. Human subject approval was obtained from the Institutional Review Board of each participating university (UCLA and the University of the Philippines). The four participating sites were randomly assigned to one of the three intervention groups (peer counseling, manager training, or the combination of peer counseling and manager training) or to a standard control group.

The peer counseling intervention was implemented in all participating establishments in Site 1. In consultation with the manager/owner, two FBW from each establishment were selected and trained during a 5-day period at a nearby location. Travel allowances and a daily stipend were provided to defray expenses and lost work time. Content areas of the training program included basic information on STI and HIV, modes of transmission, interpersonal relationships with peers and clients in the work establishment, sexual negotiation, role playing and modeling, and normative expectancies. The manager training intervention in Site 2 consisted of the same topics as the peer counselors with additional training on their social influence role as a manager/supervisor by providing positive reinforcement of their employees' healthy sexual practices. Managers were encouraged to implement a continuum of educational policies, beginning with current practices, and gradually increasing to greater levels of involvement. These policies consisted of meeting regularly with their employees, monitoring their attendance at the SHC, providing educational materials on HIV/AIDS prevention, reinforcing positive STI prevention behaviors, attending monthly managers' advisory committee meetings, promoting AIDS awareness in the establishments (through posters, pamphlets, and brochures), providing educational materials to customers, making condoms available to FBW as well as to customers, and having a 100% condom use policy (oral and written). The combined intervention of peer counselors and manager training was implemented in two contiguous cities located in Site 3. Site 4, the standard control group, continued to receive standard treatment which consisted of regular examinations at the Social Hygiene Clinic (SHC). All sites are geographically dispersed throughout the southern Philippines, resulting in minimal potential for contamination.

Participants and Procedures

Four non-contiguous locations in the southern Philippines (southern Luzon, Cebu, Ilo-Ilo and northern Mindanao) were selected owing to few ongoing HIV/AIDS prevention programs. Participants were informed of the objectives of the study and the potential risks and benefits of participation. All of the individuals who agreed to participate in the research (greater than 98%) completed an informed consent form. The participants were selected on a voluntary basis and were recruited from all entertainment-related establishments in which FBWs were employed (e.g., bars, nightclubs, beer gardens, karaoke bar, massage parlor, and hotels). Through face-to-face interviews, 1383 CSWs were interviewed from 105 establishments, including 936 bar-based workers along with their employers at the time of the baseline assessment. At the time of the post-test assessment, responses were obtained from 1484 CSWs from 145 establishments, including 986 bar-based workers and their employers. In this current study, we focus on the subgroup of FBWs who reported having received payment for sexual relations with customers during a one month period prior to the survey and especially employed at bars, nightclubs, beer gardens, discos, and karaoke bars. From the baseline survey the sample included 369 FBWs from 60 establishments (15 in

Legaspi, 19 in Cagayan, 19 in Cebu, and 7 in Ilo-Ilo). From post-test interviews the sample included 371 FBWs from 75 establishments (13 in Legaspi, 21 in Cagayan, 30 in Cebu, and 11 in Ilo-Ilo). The repeated measure, cross sectional study did not necessarily have the same women participating in the baseline and post-test samples. FBWs' perception of the attitudes and beliefs of their establishment's managers were obtained at pre- and post-test assessment from 60 and 75 managers respectively.

Measures

The present research is part of a large-scale community survey using a participatory research approach. The study included two primary components: (1) a baseline and post-intervention survey 2 years interval for both FBWs and managers in the respective establishments; (2) a prospective assessment of STI rates among FBWs. The survey consisted of 134 items. Personal interviews were conducted in the native dialect with FBWs and their establishment managers, supervisors or owners in the establishments in which they are employed. All instruments were back translated into English, with over 98% agreement among FBWs and 100% among managers/supervisors.

The FBW survey covered demographics, knowledge, attitudes, beliefs, risk behavior, perception of own risk for HIV infection, self-efficacy for condom use, alcohol and drug use and social desirability. The survey instrument developed for managers also measured attitudes and beliefs as related to perceptions of risk-taking behaviors by employees and customers and the level of support provided to employees for condom use. The manager survey also assessed characteristics of the work environment that reinforce less risky sexual behaviors such as the provision of AIDS prevention classes or educational materials for workers; the existence of mandatory condom use policy; condom provision.

The measures used in this current study included reports from the FBWs about establishment practice, manager attitudes, manager training, condom use behaviors and biologically validated STI results from the SHC. Establishment practices were operationalized by three items addressing rules and communications operating within the establishment. These items included: (1) Whether a co-worker at her establishment had ever tried to convince her to use a condom with a customer; (2) whether her establishment has a rule that all workers must use condoms when having sex with customers; and (3) whether her boss ever talked to her about using condoms. All measures were dichotomous responses (yes/no). Four items (assessed from managers) represent their attitudes based on scaled statements about condoms ranging from strongly agree (1) to strongly disagree (5). These items included: (1) A bar would lose many customers, if it requires workers to use condoms; (2) the manager should require workers to use condoms, even though it is against their religion; (3) it is the customers' decision to use condoms; (4) it is bad for business to talk about AIDS prevention. Finally, three items obtained from the manager were used to quantify their AIDS training activities. These items addressed whether or not the manager attended an AIDS training/education class, participated in monthly community meeting with other managers, and whether or not the manager attended a condom use class.

Two major outcome indicators were condom use behavior and STI. The first indicator was assessed by a validated six-item scale, having an alpha reliability coefficient of .80 (Morisky, Ang, and Sneed, 2002). These items included scaled questions ranging from 1 (never) to 5 (always) that include examples of questions that ask how often FBWs "use a condom when engaging in vaginal sex," "suggest using a condom to their partner," "carry a condom on their person." A summated score was calculated after reversed-coded adjustment. The likelihood of using condoms was estimated by total scores divided by the maximum scores (30). The second indicator was whether the FBWs had been diagnosed with an STI in the past month. This variable was coded as yes (1) and no (0). This measure

was based on the results of a clinic chart review of all visits to the SHC during the month preceding the survey. The ratio of the number of SHC visits made during the month preceding the survey divided by the number of weeks the FBW was working in the establishment during this same period (Person Weeks) is used to assess potential STI selection biases.

Data Analysis

All analyses were performed with SPSS-PC version 10.0. Bivariate analyses with Chi-square tests for categorical variables were used to determine the statistical significance of all comparisons (individual socio-demographics and social influence impacts) among FBWs from four study groups. Chi-square tests were used to assess differentials concerning establishment practices and policies, attitudes towards condom use and enforcing a condom-use policy, and attendance at AIDS training programs in the community and STI. Analysis of variance was used to assess the relative effects of the different interventions on condom use behavior, followed by regression models, controlling for hypothesized confounding factors.

RESULTS

Background of FBWs

Table 1 presents data on social and demographic characteristics of study populations from the baseline interview and post-test assessment. At baseline the 369 FBWs employed at bar/club/beer garden (63%), discos (28%), and karaoke bar (9%) were included in analyses. The ages of these FBWs ranged from 15–39 years ($m = 22.4$) and they averaged 8.5 years of school. Their average work duration was 11.20 months. Ten percent of the FBWs were married and 53.8% reported having at least one child. Average weekly income was 1166.5 pesos (approximately \$50 US). In the post-test assessment, analyses included 371 FBWs working at bars/clubs/beer gardens (45%), discos (14%), and karaoke bars (42%). Participants ranged in age from 15–41 years ($m = 22.3$), worked an average of 11.3 months, and had an average of 8.3 years of education. Only 8% of the population was married, with 55.3% of participants reporting having at least one child. Average weekly income was 1372.5 pesos or approximately \$50/week, based on a devaluation of the Philippine peso between the two time intervals.

Comparisons of the FBWs from the baseline and those from post-test assessments indicate similar social and demographic characteristics, except for weekly income. The FBWs from the post-test assessment had higher incomes than the FBWs from the baseline interviews. However, there is significant variation across the four sites for most social and demographic characteristics at the baseline and post-test assessments.

Social Influence

Table 2 presents the relationship between social influence (establishment practice, manager attitude, and manager training) and the four study sites post intervention. A higher proportion of positive establishment practice concerning condom use behavior was found in the combination intervention site at post-test assessment. Almost all FBWs in this site reported their establishments had a rule (99%) and reported that their boss talked to them about using condoms (98%); in contrast to the standard care study site in Ilo-Ilo (82%; $\chi^2_{(3)} = 86.59$, $p < .001$; 65%; $\chi^2_{(3)} = 79.59$, $p < .001$, respectively).

Manager attitudes concerning condom use behaviors were significantly more positive in the combination site compared to other sites. For example, while none of the managers in the combination site agreed or strongly agreed that a bar would lose many customers if it

required workers to use condoms, 53% in the control site agreed. Furthermore, only 12% of the managers in the combined intervention site stated that it is the customers' decision to use condoms; 42% in the standard treatment site agreed. Managers from the combined intervention group were also less likely to agree or strongly agree that talking about AIDS prevention was bad for business, whereas 10% in the peer education site, 35% in manager site, and 52% in the control site agreed or strongly agreed ($\chi^2_{(3)} = 130.21$, $p < .001$). Finally, all managers in the combination site agreed or strongly agreed that their workers should be required to use condoms even though it may be against their religion; in contrast to 76% in the manager training site and 57% in the standard care site ($\chi^2_{(3)} = 107.27$, $p < .001$).

The managers in the combined intervention site were also significantly more likely to participate in training programs addressing HIV/AIDS prevention compared to managers in other sites. Approximately 91% of the managers in the combined intervention site, for instance, attended AIDS education classes, compared to 87% in the peer education site, 48% in the manager training site, and 58% in the standard care site ($\chi^2_{(3)} = 67.89$, $p < .001$). In the combined intervention site, establishment managers were more likely to participate in community meetings about AIDS (87%) compared to managers in the peer education site (70%), the manager training site (57%), and the standard treatment site (66%) ($\chi^2_{(3)} = 28.62$, $p < .001$).

Condom Use Behavior

The combined intervention site had the highest reported likelihood of consistent condom use behavior among FBWs (93%); in contrast to 80% in the peer education site, 73% in the manager training site, and 58% in the standard treatment site ($F = 128.5$, $df = 3$, $p < .001$). Table 3 presents the results for condom use behaviors of FBWs across four study sites at pre- and post-test. Models 1 and 3 measure variations in condom use behaviors by study groups at pre- and post-test, respectively, by using simple regression models. Models 2 and 4 adjust for confounding factors such as age, education, work duration and weekly wage on condom use behavior among the four study sites. In the four models, the condom use scale is measured by a composite score comprised of six variables with a range of 6 to 30, and the standard treatment site 4 is selected as the reference group. In Model 1 FBWs assigned to the peer education group and the combined intervention group reported higher means of condom use compared to the standard treatment group at pre-test assessment by 11% ($p < .05$) and 16% ($p < .0001$), respectively. After adjusting for individual characteristics, Model 2 continued to demonstrate higher means of condom use.

Model 3 displays the crude intervention effects at post-test assessment and finds that FBWs in the combined group reported approximately 60% higher mean condom use scores compared to the standard care group ($p < .0001$), followed by FBWs at the peer counseling site (37%; $p < .0001$) and the manager training groups (25%; $p < .0001$). After adjusting for individual sociodemographic characteristics in Model 4, the intervention effects remain significant compared to the standard care group.

In contrast to the standard care group, the predicted mean changes in condom use between pre- and post-test assessment were found across all three intervention groups when considering individual socioeconomic characteristics. The most significant change was found in the combined intervention group. A two sample t-test was conducted to assess pre-post differentials. As noted in Table 4, a means comparison of predicted values in condom use behavior demonstrated highly significant differences between pre- and post-test assessment, with a t-value of 30.73 ($p < .0001$) even after controlling for individual characteristics.

STI Status

In the post-test assessments, the combined intervention site (Cebu) had the lowest observed STI infection rate (27%) followed by 40% in the manager training site (Cagayan de Oro), 53% in the standard treatment site (Ilo-Ilo), and 67% in the peer education site (Legaspi City) ($\chi^2 = 29.3$, $df = 3$, $p < .001$). Figure 1 indicates that STI rates were significantly lower for FBWs in the manager training and combined intervention groups compared to those in the other groups. While 27% of FBWs in the combined intervention site and 40% in the manager training site had STI infection three months after intervention, 67% of FBWs in the peer education group and 53% in the standard treatment group were found to have an STI ($\chi^2 = 29.3$, $df = 3$, $p < .001$).

DISCUSSION

This study is one of the first analyses of the effects of a quasi-experimental behaviorally oriented intervention hypothesized to affect the social influence on condom use behavior and STI among a high-risk group of female bar workers who reported having received payment for sex. The interventions were directed at the individual level (social modeling factors) as well as the organizational level (social-structural and environment factors). Participants in the combined study site were found to benefit most from the structural interventions in terms of increased establishment practices addressing educational policy, greater level of manager involvement, and more positive manager attitudes towards condom use behavior. The fact that a high proportion of managers in the standard treatment site (53%) indicated that the bar would lose many customers if they required customers to use condoms reflects the negative attitudes and lack of positive reinforcement between managers and employees. Managers in the intervention sites were encouraged to become actively involved in the ongoing positive reinforcement of safe sexual practices among their employees. This included actively discussing negotiation and communication skills during weekly meetings, the importance of their employees' health and economic hardships for their family when considering non-condom use. FBWs were encouraged to discuss and negotiate sexual activities to take place after work hours in the establishment so they can avail of the positive support of their managers. Managers in turn were instructed to be supportive of safe sexual behaviors whenever customers would try to convince the FBW not to use condoms. This resulted in greater assurance on the part of the FBW that her manager would support her in safe sexual negotiations with potential clients.

It is interesting that consistent condom use behavior was found to rank second highest in the peer education site, however this did not translate into lower STI rates among the FBW. In fact, the STI rate was found to be highest in the peer education site. Further analysis into the proper use of condoms among FBWs in this intervention site was obtained by analyzing the question "during the past month, did you ever have a condom fall off inside you during sexual intercourse." Responses to this question revealed that the peer education site had the highest probability of condom use failure among intervention groups, with FBWs reporting a 24% failure rate compared to 13% in the manager training site, 14% in the combined intervention site, and 30% in the standard treatment site ($\chi^2 = 8.1$, $df = 3$, $p < .044$).

Most importantly, the results of the condom use behavior scale indicated significantly higher levels of consistent use among intervention sites, particularly in the combined intervention site. There was also a significant improvement in condom use behavior from pre to post test among all intervention sites, using the standard treatment site as a reference. This significant change over time was maintained even when controlling for possible confounding variables, including age, education, work duration and weekly average salary.

Study Limitations

The use of self reports to measure sensitive outcome behavior, such as condom use, was a potential source of bias in this study. This measure may be subject to error through a social desirability bias. However, the measure was assessed for any social desirability bias and no significant differences were found between individuals who stated they use condoms always or very often compared to individuals reporting using condoms less frequently (Morisky et al., 2002). Individuals who reported high condom use behavior were also found to have lower incidence of STI. Further research is recommended on quantifying this behavior in order to provide more reliable and valid measures. Another potential bias is the possibility that preexisting and uncontrollable site differences may have contributed to some of the results. However, considerable care was taken to select representative and comparable communities in the southern Philippines and randomly assign intervention approaches to each community.

Implications for Practice

This study identifies several important structural factors existing in the work environment that influence the use of condoms for female bar workers that are employed in a variety of entertainment establishments in the Philippines. The results suggest a need for the development of comprehensive educational policies in each of these identified establishments. Particularly important is the relationship between establishment managers and their employees. Holding regular meetings with employees provides opportunities to reinforce the importance of regular attendance at the SHC and promotes STI/HIV awareness. Having a policy that all workers must use condoms and providing free condoms in the workplace are key factors that positively influence condom use among FBWs. The most important implication for public health practice is the highly significant synergistic effects of the combination of the manager training component and the peer education intervention. The results highlight the inability of the managers to influence new social norms without somehow witnessing the interaction of their employees with designated peers. Structural changes, consisting of rules, regulations and educational policy, must work in combination with normative changes (individual changes in knowledge, positive beliefs and attitudes, and normative expectancies). This combined approach results in a participatory collaboration on the part of establishment managers and employees, leading to higher rates of consistent condom use behavior and reduced incidence of STIs. Finally, the participatory exchange can be expanded by encouraging city and municipal governments to enforce existing ordinances requiring FBWs to be registered at the SHC.

These findings present important implications for research and program planning in this field. As the setting and dynamics within which commercial sex occur have changed over time, so too must the development of STI and HIV prevention methodology and interventions to reflect the changing needs and reality of the women affected.

Acknowledgments

This research was supported by grant R01-AI33845 from the National Institutes of Allergy and Infectious Diseases to Donald E. Morisky, and grant PO1-DA-01070-30 to Judith A. Stein from the National Institute on Drug Abuse. The authors would like to thank Co-Investigator Teodora Tiglaio, Research Managers Daisy Mejilla and Charlie Mendoza, and Site Coordinators Dorcas Romen, Mildred Publico, Angie Casas, and Lolipil Gella.

References

- Bandura, A. Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall; 1986.

- Bandura, A. Social Cognitive Theory and Exercise of Control over HIV Infection. In: DiClemente, RJ.; Peterson, JL., editors. Preventing AIDS: Theories and Methods of Behavioral Interventions. New York: Plenum Press; 1994. p. 25-59.
- Bloom SS, Urassa M, Isingo R, Ng'weshemi J, Boerma JT. Community effects on the risk of HIV infection in rural Tanzania. *Sex Transm Infect.* 2002; 78(4):261–6. [PubMed: 12181463]
- Davis KR, Susan C Weller. The effectiveness of condoms in reducing heterosexual transmission of HIV. *Family Planning Perspectives.* 1999; 31(6):272–279. [PubMed: 10614517]
- Fontanet AL, Saba J, Chandelying V, Sakondhavat C, Bhiraueus P, Rugpao S, Chongsomchai C, Kiriwat O, Tovanabutra S, Dally L, Lange JM, Rojana-pithayakorn W. Protection against sexually transmitted diseases by granting sex workers in Thailand the choice of using the male or female condom: results from a randomized controlled trial. *AIDS.* 1998; 12 (14):1851–1859. [PubMed: 9792386]
- Ford K, Wirawan DN, Fajans P, Meliawan P, MacDonald K, Thorpe L. Behavioral interventions for reduction of sexually transmitted disease/HIV transmission among female commercial sex workers and clients in Bali, Indonesia. *AIDS.* 1996; 10:213–245. [PubMed: 8838711]
- French, JRP., Jr; Raven, BH. The bases of social power. In: Cartwright, D., editor. *Studies in social power.* Ann Arbor, MI: Institute for Social Research; 1959. p. 150-167.
- Hanenberg R, Rojanapithayakorn W. Changes in prostitution and the AIDS epidemic in Thailand. *AIDS Care.* 1998; 10:69–79. [PubMed: 9536203]
- Harvey SM, Bird ST, Galavotti C, Duncan EAW, Greenberg D. Relationship, power, sexual decision making and condom use among women at risk for HIV/STDs. *Women & Health.* 2002; 36 (4):69–84.
- Lewin, K. Analysis of the concepts whole, differentiation, and unity. Vol. 18. University of Iowa Studies in Child Welfare; 1941. p. 226-261.
- Liu TI, So R. Knowledge, Attitude, and Preventive Practice Survey Regarding AIDS Comparing Registered to Freelance Commercial Sex Workers in Iloilo City, Philippines. *Southeast Asian J Tropical Med Public Health.* 1996; 27:696–702.
- Morisky DE, Stein JA, Sneed CD, Tiglaio TV, Liu K, Detels R, Tempongko SB, Baltazar JC. Modeling personal and situational influences on condom use among establishment-based commercial sex workers in the Philippines. *AIDS & Behavior.* 2002; 6:163–172.
- Morisky DE, Tiglaio TV, Sneed CD, Tempongko SB, Baltazar JC, Detels R, Stein JA. The effects of establishment practices, knowledge and attitudes on condom use among Filipina sex workers. *AIDS Care.* 1998; 10:213–220. [PubMed: 9625904]
- Morisky DE, Ang A, Sneed CD. Validating the effects of social desirability on self-reported condom use behavior among commercial sex workers. *AIDS Education and Prevention.* 2002; 14(5):351–60. [PubMed: 12413181]
- The Philippines Health Department. Technical report. 1996.
- Raven, BH. Social influence and power. In: Steiner, ID.; Fishbein, M., editors. *Current studies in social psychology.* New York: Wiley; 1965. p. 399-444.
- Reed BD, Ford K, Wirawan DN. The Bali STD/AIDS study: association between vaginal hygiene practices and STDs among sex workers. *Sex Transm Infect.* 2001; (1):46–52. [PubMed: 11158691]
- Sedyaningsih-Mamahit ER. Clients and brothel managers in Kramat Tunggak, Jakarta, Indonesia: Interweaving qualitative with quantitative studies for planning STD/AIDS prevention programs. *Southeast Asian J Tropical Med Public Health.* 1996; 28:513–524.
- Sugihantono A, Slidell M, Syaifudin A, Pratjojo H, Utami IM, Sadjimin T, Mayer KH. Syphilis and HIV prevalence among commercial sex workers in Central Java, Indonesia: Risk-taking behavior and attitudes that may potentiate a wider epidemic. *AIDS Patient Care and STDs.* 2003; 17 (11): 595–600. [PubMed: 14746667]
- Sumartojo E. Structural factors in HIV prevention: concepts, examples, and implications for research. *AIDS.* 2000; 14:S3–S10. [PubMed: 10981469]
- WHO. 2002. http://www.who.int/hiv/pub/sti/en/who_hiv_2002_14.pdf
- WHO. 2001. http://www.wpro.who.int/pdf/sti/aids2001/part2_grp1.pdf

- WHO. Sex Work in Asia. 2001.
(<http://www.wpro.who.int/document/FINAL-Sex%20Work%20in%20Asia.doc>)
- UNAIDS. Country Profile: HIV/AIDS in the Philippines. 2001.
(http://www.synergyaids.com/documents/Philippines_profile.pdf)

FIGURE 1.
STI Rate by Study Group at Post-Test ($\chi^2 = 29.3$, $df. = 3$, $p < .001$)

Distribution (Mean [Std Dev]/Numbers [Percentage]) of Socio-Demographic Characteristics of the FBW Participants by Study Groups at Baseline and Post-Test Assessments

TABLE 1

	Peer Education (Legaspi)		Manager Training (Cagayan)		Combined Intervention (Cebu)		Standard Care (Ilo-Ilo)		Total		Statistic test	
	Pre (n = 80)	Post (n = 33)	Pre (n = 132)	Post (n = 57)	Pre (n = 115)	Post (n = 219)	Pre (n = 42)	Post (n = 62)	Pre (n = 369)	Post (n = 370)	Pre	Post
Mean age in years	24.29 (4.80)	23.03 (6.28)	22.27 (3.95)	23.75 (4.27)	22.06 (3.81)	22.02 (4.24)	20.07 (2.03)	21.42 (3.41)	22.39 (4.11)	22.27 (3.41)	$F_{3, 365} = 11.31^{***}$	$F_{3, 367} = 3.60^*$
Mean schooling in years	8.26 (1.95)	7.85 (2.05)	8.77 (1.82)	7.93 (2.37)	8.08 (2.06)	8.32 ^c (2.03) ^b	9.29 (1.42)	8.56 (2.06)	8.50 (1.92)	8.26 (2.10)	$F_{3, 365} = 5.36^*$	$F_{3, 366} = 1.39$
Work duration in months	8.23 (7.75)	10.30 (8.40)	13.20 (15.73)	12.95 (10.37)	8.65 (9.28)	9.07 (11.15)	8.79 (9.07)	18.13 (17.92)	10.20 (11.91)	11.29 (12.64)	$F_{3, 365} = 4.49^*$	$F_{3, 367} = 9.28^{***}$
Mean weekly wage in pesos	793.04 (599.61)	1460.67 (1331.36)	1087.73 (776.51)	921.58 (542.68)	1137.30 (903.13)	1400.94 (1067.79)	2221.95 (2011.41)	1639.52 (1419.11)	1166.54 (1070.54)	1372.47 (1116.29)	$F_{3, 365} = 19.26^{***}$	$F_{3, 367} = 4.52^*$
Marital status ^a												
Living alone	53 (66.30%)	22 ^c (68.80%)	86 (65.20%)	37 (64.90%)	94 (81.70%)	167 ^d (76.60%)	31 (73.80%)	31 (50.00%)	264 (71.50%)	257 (69.60%)	$\chi^2 = 9.73^*$ df = 3	$\chi^2 = 16.93^*$ df = 3
Married or single living with boyfriend	27 (33.80%)	10 ^c (31.30%)	46 (34.80%)	20 (35.10%)	21 (18.30%)	51 ^c (23.40%)	11 (26.20%)	31 (50.00%)	105 (28.50%)	112 (30.40%)		
Recruitment into sex work ^b												
by advertisement	31 (38.80%)	16 (48.50%)	82 (62.1%)	40 (70.20%)	48 (41.70%)	73 (33.30%)	17 ^e (43.60%)	12 (19.40%)	178 (48.60%)	141 (38.00%)	$\chi^2 = 15.33^*$ df = 3	$\chi^2 = 37.76^{***}$ df = 3
self/other	49 (61.30%)	17 (51.50%)	50 (37.90%)	17 (29.80%)	67 (58.30%)	146 (66.70%)	22 ^d (56.40%)	50 (80.60%)	188 (51.40%)	230 (62.00%)		

^aMarital status: FBWs categorized as living alone include single (never married), separated (living alone), and widowed. For those who were categorized as living with somebody else, they were single but living with their boyfriend and married (s/b).

^bRecruitment was categorized into 2 levels. One was recruited by answering an ad or applied by self. Another was recruited by other venues, including a friend, relative, or family member, a mamasan, an establishment owner, or employment agency.

^cOne case in Cebu did not respond to question regarding her schooling at the post-test assessment.

^dThere was one case in Legaspi and one case in Cebu, who did not respond to the question regarding marital status at post-test assessment.

^eThree cases in Ilo-Ilo site did not respond to the question regarding recruitments into sex work at the baseline assessment.

*** refers to p-value < .0001.

** refers to p-value < .001.

* refers to p-value < .05.

TABLE 2
Frequencies of Establishment Practice, Manager Attitude and Manager Training by Study Group at the Post-Test Assessment (n = 371)

	Peer Education (Legaspi)	Manager Training (Cagayan)	Combined Intervention (Cebu)	Standard Treatment (Ilo-Ilo)	$\chi^2_{(3)}$
<i>Establishment practice</i>					
1. Your co-workers try to convince you to use a condom with a customer.	68.80%	54.40%	58.70%	75.80%	8.01*
2. Your establishment has a rule that all workers must use condoms when having sex with customers.	86.70%	53.70%	98.60%	82.30%	86.59***
3. Your boss ever talked to you about using condoms.	73.30%	59.30%	98.20%	64.50%	79.59***
<i>Manager attitudes</i>					
<i>If you strongly agree or agree:</i>					
1. A bar would lose many customers, if it requires workers to use condoms	0.00%	22.00%	0.00%	53.20%	128.71 ^a ***
2. The manager should require workers to use condoms, even though it is against their religion.	100.00%	75.90%	100.00%	56.50%	107.27***
3. It is customers' decision to use condoms.	46.70%	46.30%	12.40%	41.90%	48.19***
4. It is bad for business to talk about AIDS prevention.	10.00%	35.20%	0.00%	51.60%	130.21 ^a ***
<i>Manager training</i>					
<i>You attended:</i>					
1. AIDS education classes.	86.70%	48.10%	91.30%	58.10%	67.89***
2. Community meetings about AIDS.	70.00%	57.40%	86.70%	66.10%	28.62***
3. Condom use classes in the past 6 months.	73.30%	70.40%	75.20%	61.30%	4.75

^a Likelihood ratio is used, instead of Pearson's Chi Square, since there is at least one cell that has expected count less than 5.

* p < .05;

** p < .001;

*** p < .0001

TABLE 3

Regressions of Condom Use Behavior on Intervention Effects Controlling for Individual Sociodemographic Characteristics [Unstandardized Coefficients (Std Dev)] from Baseline Interview and Post-Test Assessment

	Baseline (n = 369)		Post-test (n = 370)	
	Model 1 b (SE)	Model 2 b (SE)	Model 3 b (SE)	Model 4 b (SE)
<i>Intervention effect</i>				
Peer Education (Legaspi) ^a	2.34(1.05) *	4.14(1.16) ***	6.40(0.89) ***	6.45(0.92) ***
Manager Training (Cagayan) ^a	0.47(0.86)	1.37(0.95)	4.33(0.75) ***	4.68(0.79) ***
Combined Intervention (Cebu) ^a	3.40(0.86) ***	4.40(0.94) ***	10.48(0.58) ***	10.57(0.61) ***
<i>Individual Sociodemographic Characteristics</i>				
Age		-0.20(0.07) *		-0.12(0.05) *
Education		0.56(0.14) ***		0.11(0.10)
Work Duration		-0.01(0.02)		-0.00(0.02)
Weekly Wage		0.00(0.00)		-0.00(0.00)
Marital Status (ref = living alone) Living with sb		-0.22(0.58)		0.03(0.47)
Recruitment to work (ref = AD or self)		0.16(0.53)		-0.52(0.43)
Recruited by others				
INTERCEPT	20.91(0.74) ***	19.70(2.17) ***	17.52(0.53) ***	18.91(1.43) ***
R ²	0.11	0.20	0.54	0.56

^aReference group = Standard Care Group at Ilo-Ilo Site

*
p < .05;

**
p < .001;

p < .0001

TABLE 4

Predicted Values of Condom Use Behavior Adjusted for Individual Sociodemographic Characteristics at Baseline and Post-Test Assessments [Means (Std Dev)]

	Peer Education (Site 1)	Manager Training (Site 2)	Combined (Site 3)	Standard Treatment (Site 4)
Baseline Assessment	23.25(1.17)	21.38(2.56)	24.31(1.42)	20.86(2.15)
Post-test Assessment	23.88(3.15)	21.85(1.93)	27.99(0.78)	17.52(1.13)
Change from Baseline to Post-test ^a	+0.63	+0.47	+3.68	-3.34
t-test ^b	$t_{111} = 2.63^*$	$t_{187} = 1.24^*$	$t_{332} = 30.73^{***}$	$t_{109} = -11.23^{***}$

^a Positive sign means increase in condom use from baseline to follow-up assessment. Negative sign means decrease in condom use from baseline to follow-up assessment.

^b Independent t-test.

* $p < .05$;

** $p < .001$;

*** $p < .0001$