Engagement with Peer Health Educators Is Associated with Willingness to Use Pre-Exposure Prophylaxis Among Male Sex Workers in Ho Chi Minh City, Vietnam

Catherine E. Oldenburg, MPH,¹ Katie B. Biello, PhD, MPH,^{1,2} Donn Colby, MD,^{3,4}
Elizabeth F. Closson, MSc,² Thi Nguyen, MPH,³ Nguyen N.N. Trang, MPH,⁵ Hang X. Lan, MD,⁵
Kenneth H. Mayer, MD,^{2,6,7} and Matthew J. Mimiaga, ScD, MPH^{1,2,8}

MEN WHO HAVE SEX WITH MEN (MSM), including male sex workers (MSW), in Vietnam are at high risk for HIV transmission and acquisition, due to specific psychosocial and contextual factors including stigma and discrimination.^{1,2} MSW are particularly vulnerable due to the local legal environment, power dynamics (i.e., dependence on sex for livelihood), and individual-level risk.³ However, despite increasing HIV prevalence,⁴ few HIV prevention interventions have been specifically developed for this population. Identification of HIV prevention strategies that are tailored to the needs of MSW are urgently needed.

The iPrEx trial demonstrated the efficacy of taking daily oral pre-exposure prophylaxis (PrEP) to reduce HIV transmission among MSM.⁵ To date, little research has specifically considered the acceptability of PrEP among MSW in Vietnam. PrEP may be a particularly useful intervention for MSW as it is a user-controlled intervention. Peer educators (PE) are valuable sources of HIV prevention information for MSW in Vietnam,⁶ and may have a role to play in the development and administration of PrEP interventions. We assessed factors associated with access to PE and the association between contact with a PE and willingness to take PrEP as a potential strategy for implementation of PrEP interventions.

In 2010, a behavioral and psychosocial survey was undertaken with 300 MSW in Ho Chi Minh City (HCMC), Vietnam, which assessed past experience with HIV prevention activities and interest in PrEP. The survey was developed following an initial qualitative phase.⁶ Detailed methods have been described previously.⁷ Briefly, participants were recruited by PE from a Vietnamese NGO working with MSM, using venue-based sampling stratified on where participants met clients (i.e., street, brothel). Eligible participants were at least 15 years of age, biologically male, Vietnamese citizens who reported exchanging sex for money or goods at least once in the previous month. The

survey was anonymous, and participants gave verbal informed consent after receiving information about the study from one of the research staff. Study procedures were approved by the Institutional Review Boards at Beth Israel Deaconess Medical Center and the Ho Chi Minh City Provincial AIDS Committee.

The survey contained items pertaining to past participation in HIV prevention programs including if they had received HIV prevention materials (i.e., condoms, personal lubricant, or informational brochures), knowledge of HIV testing and counseling services, HIV/STI testing history, and contact with PE in the previous 12 months. Questions pertaining to willingness to participate in future HIV prevention interventions were adapted from prior studies by our group⁸ and asked if they would take a daily pill if it would protect against HIV and how likely they were to take the pill if it had side effects. Demographic and behavioral factors were also assessed.

Descriptive statistics were calculated for responses regarding past HIV prevention activities and willingness to take PrEP. Logistic regression models were used to analyze the association between demographic and behavioral factors and (1) past contact with a PE; and (2) being at least “somewhat likely” to take a daily pill for HIV prevention if it had side effects. A multivariable model for each outcome was built using backwards elimination starting with all potential covariates, with a *p* value cutoff of 0.2 to determine the final variables to retain in the model. An alpha level of 0.05 was considered significant. Stata 12.0 (StataCorp, College Station, TX) was used for all analyses.

Of 300 participants in the original study, 281 (93.7%) were HIV-uninfected and included in these analyses.⁹ Table 1 lists the proportion of participants who indicated previous participation in HIV prevention activities and interest in PrEP. More than 2/3 of participants had previous contact with a PE. Most (95.4%) participants indicated that they would take

Departments of ¹Epidemiology and ⁷Global Health and Population, Harvard School of Public Health, Boston, Massachusetts.

²The Fenway Institute, Fenway Community Health Boston, Massachusetts.

³Harvard Medical School AIDS Initiative in Vietnam, Ho Chi Minh City, Vietnam.

⁴Center for Applied Research on Men and Health, Ho Chi Minh City, Vietnam.

⁵Centre for Promotion of Quality of Life (Life Centre), Ho Chi Minh City, Vietnam.

⁶Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

⁸Department of Psychiatry, Harvard Medical School/Massachusetts General Hospital, Boston, Massachusetts.

TABLE 1. PROPORTION OF PARTICIPANTS WHO HAVE PARTICIPATED OR WOULD PARTICIPATE IN HIV PREVENTION INTERVENTIONS (N=281)

	N (%)	Exact binomial 95% CI
<i>Past participation in HIV prevention activities</i>		
Received free condoms in the past 12 months	208 (74.3%)	68.7–79.3%
Received free personal lubricant in past 12 months	199 (71.1%)	65.4–76.3%
Received HIV information brochures in past 12 months	200 (71.4%)	65.8–80.0%
Know where to go for HIV testing	210 (75.0%)	69.5–80.7%
Ever had HIV test	140 (49.8%)	43.8–55.8%
Ever had STI test	99 (35.4%)	29.8–41.3%
Contact with a peer health educator in the past 12 months	190 (68.1%)	62.3–73.5%
<i>Willingness to participate in pre-exposure prophylaxis programs</i>		
Would take daily pill if it would protect against HIV	267 (95.4%)	92.2–97.5%
How likely to take a pill if it had side effects		
Not likely	45 (16.3%)	12.1–21.1%
Somewhat unlikely	32 (11.6%)	8.0–15.9%
Neutral	43 (15.5%)	11.5–20.3%
Somewhat likely	147 (53.1%)	47.0–59.1%
Very likely	10 (3.6%)	1.7–6.5%
Would prefer a lubricant to a pill	77 (27.7%)	22.5–33.4%

PrEP, although substantially fewer indicated they would take PrEP given side effects (56.7%).

Table 2 displays bivariate and multivariable models assessing factors associated with (1) contact with a PE in the previous year, and (2) being at least “somewhat likely” to take PrEP if it had side effects. MSW who reported previous contact with a PE (AOR 2.28, 95% CI 1.25–4.14) indicated increased willingness to use PrEP. In a multivariable model, older age (AOR 1.09, 95% CI 1.01–1.16) was associated with increased contacts with PE, and identifying as *bóng lợ* (effeminate, AOR 0.29, 95% CI 0.11–0.75), or *trai thẳng* (“straight boy”, AOR 0.43, 95% CI 0.23–0.80) versus *bóng kín* (masculine) was associated with decreased contact with PE.

Participants who had previous contact with a PE more frequently indicated that they would take PrEP than those who had not. As PrEP becomes available for MSM in Vietnam, PE will likely play a large role in recruiting and educating participants about the efficacy of PrEP, adherence, and safer sex practices, and counseling related to stigma, side effects, and local resources. Training PE may increase the acceptability of PrEP for Vietnamese MSM, and their role in the expansion of PrEP services in Vietnam should be carefully considered. Given the high penetrance of PE in this population, leveraging this existing infrastructure may improve the feasibility and success of future HIV prevention interventions such as PrEP.

Strategies to increase access to PE among key subpopulations are important to improve the scope and quality of programs based on this model. In this study, older men were more likely to have been reached by PE in the past year. This could reflect differences in social networks,¹⁰ and they are likely to have had more opportunities to be reached by peers, compared to younger men who have recently “come out.” Younger participants are a particularly vulnerable group, and future work should consider how to engage them in HIV prevention services.¹¹ Participants identifying as *bóng lợ* or *trai thẳng* versus *bóng kín* less frequently indicated engagement with PE. While

bóng lợ are more visible than other MSM identities in Vietnam,¹² due to this visibility, they may also be more susceptible to stigma and therefore less likely to be willing to engage in peer education services in public settings. Similarly, *trai thẳng* may not want to be seen in public or be less willing to engage in peer education since they identify as “straight”.¹² Investments should be made to identify strategies to facilitate engagement with PE by *bóng lợ* or *trai thẳng*.

This study has several potential limitations. Data collection relied on self-report, which could result in under- or over-reporting of sensitive behaviors. Questionnaires were administered by interviewers, which could result in social desirability bias. Finally, questions regarding side effects related to PrEP did not specify the specific side effects may be, or how severe they could be. More in-depth questions could elucidate which side effects would be barriers to taking PrEP among this population.

PE may have the ability to access vulnerable hidden populations that are not reached by mainstream HIV prevention messages, which could maximize uptake of interventions such as PrEP. The results of this study indicate that integrating PE into future PrEP interventions may be an effective way to engage MSW in PrEP. The development of interventions that reach MSW and ensuring they are aware of choices and strategies for HIV prevention will be an important component of a comprehensive HIV prevention strategy in for MSW in Vietnam.

Acknowledgments

Funding: This study was conducted with the support of a pilot grant from Harvard Catalyst–The Harvard Clinical and Translational Science Center (PIs: Colby and Mimiaga). CEO is supported by National Institute of Allergy and Infectious Disease T32AI007535 (PI: Seage).

Author Disclosure Statement

None of the authors have any conflicts of interest to report.

TABLE 2. BIVARIATE AND MULTIVARIABLE LOGISTIC REGRESSION MODELS ASSESSING FACTORS ASSOCIATED WITH CONTACT WITH PEER EDUCATOR IN LAST 12 MONTHS AND WILLINGNESS TO TAKE PRE-EXPOSURE PROPHYLAXIS (PrEP) IF IT INVOLVED SIDE EFFECTS

<i>Covariate</i>	<i>Previous contact with peer health educator (Past 12 months)</i>			<i>Would be at least “somewhat likely” to take PrEP if it had side effects</i>		
	<i>OR (95% CI)</i>	<i>p</i>	<i>AOR^a (95% CI)</i>	<i>OR (95% CI)</i>	<i>p</i>	<i>AOR^a (95% CI)</i>
Age	1.07 (1.01–1.14)	0.03	1.08 (1.01–1.16)	1.05 (1.00–1.11)	0.054	1.05 (0.99–1.12)
Education (high school or above)	1.49 (0.89–2.47)	0.13	**	1.47 (0.90–2.38)	0.12	1.92 (1.05–3.49)
Married (married or divorced vs. never married)	1.43 (0.38–5.40)	0.60	**	0.75 (0.24–2.40)	0.63	**
Time spent on internet/week	1.06 (0.93–1.21)	0.03	1.12 (0.95–1.32)	1.06 (0.93–1.20)	0.37	**
Average monthly income (×100,000 VND)	1.01 (1.00–1.01)	0.26	**	1.00 (0.99–1.01)	0.78	**
Gender identity						
Bóng lỘ vs. bóng kín	0.45 (0.19–1.04)	0.06	0.29 (0.11–0.75)	1.11 (0.49–2.58)	0.81	**
Trại thẳng vs. bóng kín	0.37 (0.21–0.65)	<0.001	0.43 (0.23–0.80)	0.58 (0.34–0.99)	0.04	
Overall		0.001			0.20	
Sexual orientation						
Bisexual vs. homosexual	0.66 (0.37–1.17)	0.15	**	0.35 (0.20–0.62)	<0.001	0.39 (0.21–0.74)
Heterosexual vs. homosexual	0.60 (0.30–1.20)	0.15		0.47 (0.24–0.92)	0.03	0.81 (0.38–1.71)
Overall		0.21			0.0008	0.01
Past contact with peer health educator		–	–	2.01 (1.22–3.31)	0.006	2.28 (1.25–4.14)
Ever disclosed sexual orientation to other MSWs	2.19 (1.10–4.33)	0.03	2.66 (1.23–5.75)	1.53 (0.77–3.03)	0.22	**
Ever disclosed sexual orientation to non-MSW friends	1.28 (0.76–2.16)	0.35	**	1.08 (0.66–1.78)	0.75	**
Ever disclosed sexual orientation to family member	0.98 (0.55–1.74)	0.94	**	1.49 (0.85–2.60)	0.16	1.77 (0.93–3.36)
Ever disclosed sexual orientation to healthcare worker	1.67 (0.96–2.90)	0.07	**	1.58 (0.95–2.64)	0.08	**
UAS with a male client in past 3 months	1.35 (0.74–2.47)	0.33	**	0.99 (0.57–1.72)	0.98	**
UAS with male non-commercial partner in past 3 months	2.11 (1.06–4.21)	0.035	**	1.51 (0.83–2.73)	0.18	**

AOR adjusted odds ratio; CI confidence interval; OR odds ratio; UAS unprotected anal sex.
^aFinal multivariable logistic regression model selected via backwards elimination with a *p* value cutoff of 0.2.
 **, not retained in multivariable model.
 –, not included in model.

References

1. Colby D, Cao NH. Men who have sex with men and HIV in Vietnam: A review. *AIDS Edu Prevent* 2004;16:45–54.
2. Nguyen TA, Nguyen HT, Le GT, Detels R. Prevalence and risk factors associated with HIV infection among men having sex with men in Ho Chi Minh City, Vietnam. *AIDS Behav* 2007;12:476–482.
3. Baral S, Logie CH, Grosso A, Wirtz AL, Beyrer C. Modified social ecological model: A tool to guide the assessment of the risks and risk contexts of HIV epidemics. *BMC Public Health* 2013;13:482.
4. Hoang TV, Tuan NA, Vi LNL, et al. Results from the HIV/STI integrated biological and behavioral surveillance (IBBS) in Vietnam—Round II 2009. Ministry of Health in Vietnam, 2009.
5. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587–2599.
6. Mimiaga MJ, Reisner SL, Closson EF, et al. Self-perceived HIV risk and the use of risk reduction strategies among men who engage in transactional sex with other men in Ho Chi Minh City, Vietnam. *AIDS Care* 2013; 25:1029–1044.
7. Biello KB, Colby D, Closson E, Mimiaga MJ. The syndemic condition of psychosocial problems and HIV risk among male sex workers in Ho Chi Minh City, Vietnam. *AIDS Behav* 2013. doi:10.1007/s10461-013-0632-8.
8. Mimiaga MJ, Case P, Johnson CV, Safren SA, Mayer KH. Preexposure antiretroviral prophylaxis attitudes in high-risk Boston area men who report having sex with men: Limited knowledge and experience but potential for increased utilization after education. *J Acquir Immune Defic Syndr* 2009;50:77–83.
9. Colby D, Trang NNN, Lan HTX, et al. Prevalence of sexually transmitted diseases, HIV, and hepatitis among male sex workers in Ho Chi Minh City, Vietnam. *Int J Infect Dis* 2012;16:e332.
10. Young I, Li J, McDaid L. Awareness and willingness to use HIV pre-exposure prophylaxis amongst gay and bisexual men in Scotland: Implications for biomedical HIV prevention. *PLoS ONE* 2013;8:e64038.
11. Valleroy LA, MacKellar DA, Karon JM, et al. HIV prevalence and associated risks in young men who have sex with men. *JAMA* 2000;284:198–204.
12. Ngo DA, Ross MW, Phan H, Ratliff EA, Trinh T, Sherburne L. Male homosexual identities, relationships, and practices among young men who have sex with men in Vietnam: Implications for HIV prevention. *AIDS Edu Prevent* 2009;21:251–265.

Address correspondence to:
Matthew J. Mimiaga, ScD, MPH
1 Bowdoin Square, 7th Floor
Boston, MA 02114

E-mail: mmimiaga@hsph.harvard.edu