



ORIGINAL ARTICLE

Identifying Barriers to Human Immunodeficiency Virus Testing for Men Who Have Sex with Men in South Korea

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Abstract

Objectives: The principal objective of this study was to identify the barriers to testing for men who have sex with men (MSM) in Korea, something that might prove useful in future studies of this nature.

Methods: This study was conducted at gay bars nationwide in Korea. After considering several offline locations (gay bars) where MSM candidates are commonly located, random recruitment was performed using time–location sampling. A total of 944 individuals participated in this survey. A total sample of 921 cases (23 cases were excluded) was used for analysis. A self-administered questionnaire measuring the individuals' demographics, human immunodeficiency virus (HIV)/AIDS knowledge, stigma, phobia, optimism bias, self-efficacy for condom use, and sexual practices was used.

Results: About 61.8% ($N = 569$) of respondents reported having been tested at least once in their lifetime, and 38.9% ($N = 358$) acknowledged being tested within the past 12 months. After adjusting for age, education, and number of partners in a logistic regression analysis, awareness of testing place [odds ratio (OR) = 4.04], exposure to HIV prevention campaign (1.54), fear (OR = 1.13), and discrimination toward people with HIV/AIDS (OR = 0.94) were the main factors associated with HIV testing.

Conclusion: To accomplish widespread HIV testing for Korean MSM, the accessibility of testing centers and advertisement of voluntary counseling and testing to MSM are needed.

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1. Introduction

Since the human immunodeficiency virus (HIV) was first discovered nearly 30 years ago, 2,500,000 new cases have been discovered as of 2011, and 3,420,000 people worldwide are reported to be living with the disease. In 2010, a total of 1,800,000 people died from AIDS-related illnesses, and from the time HIV/AIDS was first discovered until now, the total estimated death toll is approximately 3,000,000 people. Consequently, HIV/AIDS has become an even more significant international health issue, even more so than more common diseases such as tuberculosis and malaria. Nonetheless, within the past 10 years, HIV transmission rates have appeared to be on the decline, positive evidence of worldwide efforts aimed at global prevention and cure. By contrast, the prevalence of HIV among the men who have sex with men (MSM) population continues to increase, particularly in certain parts of Asia [1–3]. This includes the Republic of Korea and is partly attributable to the number of HIV transmissions among MSM, which has increased from just two cases in 1985 to >1000 new cases (1114) per year in 2013 [4]. In Korea, transmission is believed to be most likely due to direct sexual contact rather than other causes such as intravenous drug use or mother-to-child transmission, both of which are commonly observed in other countries. Contrary to popular belief, the heterosexual community in Korea is in no way exempt from risk of transmission. In fact, although a certain level of incidence is seen in both homosexual and heterosexual communities, social discrimination greatly contributes to the low level of cases observed in the homosexual community because of underreporting. Excluding foreign individuals, incidence rates for Korean men were shown to be 11.6 times higher than that of Korean women. Moreover, although the highest infection rates were once found among individuals in their 30s, they are now more frequently seen among individuals in their 20s [4].

Throughout Asia, the topic of sexual behavior among MSM has become one of significant interest and concern to society, owing mainly to an increased recognition of the increased risk of HIV infection among MSM [3]. However, although many studies among the general population have been conducted and published, information about MSM in South Korea is largely unknown. Discussion of the topics of homosexuality and HIV/AIDS is considered uncomfortable. As a result, research on HIV/AIDS and MSM is at a relatively underdeveloped state in Korea. In 2011, out of 552 new cases of HIV infection, HIV infection caused by homosexual sexual encounters accounted for 42% of all cases whereas heterosexual sex accounted for 58% [5]. These figures, however, are based on infected individuals' self-reported sexual orientation whether homosexual or heterosexual. Owing to the social stigma surrounding

homosexuality, there is a much greater likelihood that individuals will conceal their homosexuality. MSM are now regarded as one of the main target groups for HIV prevention programs. For individuals vulnerable to the virus, such as those within the MSM community, implementation and promotion of HIV testing has become increasingly important. HIV testing directed toward key populations at higher risk such as MSM may assist individuals with maintenance and monitoring of their serostatus and lead to earlier treatment and prevention of further transmission to others [3]. However, there is currently little information available with regard to HIV testing among the MSM population in South Korea. This may be attributable, at least in part, to difficulties in identifying and contacting MSM. Therefore, the principal objective of this study was to identify the barriers to testing for MSM in Korea, something that might prove useful in future studies of this nature. This study is one of the first major studies to identify barriers to HIV testing among the MSM population in South Korea.

There remains a question of why more research is not being conducted to combat the spread of infection and encourage better testing behavior. Furthermore, another important point regarding the scarcity of additional information on the subject, whether in academic or public arenas, is the lack of efforts being made to generate more positive feelings toward testing and homosexuality as a whole.

Following a review of 24 different research articles discussing the barriers to HIV testing in Europe, the results of meta-analysis showed that handling barriers was perceived as low risk. HIV/AIDS-related fear, fear of being outed, access to healthcare, and other factors were all commonly noted [6]. A low perceived risk of one's potential for contracting HIV was conceptualized by Neil D. Weinstein as something called optimistic bias and notion [7]. In other words, many people tend to report a much lower perceived risk. This, however, is definitely not attributable to a low perception of one's potential risk of infection. Even with knowledge of the danger of HIV/AIDS itself, if there is an optimistic bias, the associated risk is not perceived. In Korea, several research studies on HIV/AIDS as it relates to optimistic bias have been reported [8,9]. It is a fact that fears associated with HIV/AIDS interfere with HIV testing. Because in the past, HIV/AIDS-related fears have contributed negatively to the likelihood of death, prejudice and discrimination are currently becoming more important contributing factors—that is to say that confirmation of a positive test result subjects individuals to discrimination from those around them. Forty-one individuals in San Francisco, CA, USA, who reported having been infected with the virus within the past year stated that, prior to contracting the virus, they themselves had never been tested, the main reason being the fear of actually finding out that they were indeed

infected with HIV [10]. HIV testing is avoided under circumstances of heightened fear [10–12]. In addition, once the results of the test are made known to others, there is a fear of becoming a potential object of discrimination, which then causes people to avoid HIV testing. For two locations in China, where the rate of infection is highest, a representative sample of 1012 people were educated regarding voluntary counseling and testing (VCT). For 2 months after implementation, participants were surveyed in order to determine how many times they had undergone testing. Although 459 individuals expressed intent to undergo testing, only 193 were actually tested, with just 42 who reported having been tested within that specified 2-month period. The main reasons for avoiding testing included the following: they saw little risk of infection, fear of exposure, fear of branding, and fear of discrimination [13].

With the exception of these common factors, there are many other factors that can serve as barriers. Fears associated with testing also seem to be on the downward slope. For many emigrants from Africa and the Middle East living in Paris, France, socioeconomic status along with residential area were reported as barriers to HIV testing. Access to testing for both residents and immigrant workers in areas where the rate of HIV infection is high is becoming a central issue [6].

2. Materials and methods

2.1. Sample and data collection procedures

This study was conducted in Seoul, Busan, Daegu, and Gwangju City in Korea, which are the largest Korean cities with the largest number of MSM. Two criteria were used to determine eligibility for participation in this study. Participants had to be men between the ages of 19 years and 59 years having either insertive or receptive sexual intercourse with other men.

Because homosexuality and bisexuality are so heavily stigmatized in South Korean society, surveying or even contacting those within its populations is very difficult. Very few, if any at all, ever “come out.” This contributes heavily to the nearly nonexistent LGBT (lesbian, gay, bisexual, and transgender) community in South Korea. Thus, alternative strategies such as this one are ideal for surveying “hidden populations.” After considering several offline locations (gay bars) where MSM candidates are commonly located, random recruitment was performed using time–location sampling (TLS). In doing so, time and location (MSM clubs and bars) were randomly selected rather than individuals.

Prior to the launch of the survey, individuals who also identified as gay were trained as interviewers on the TLS method and were provided with wireless iPads as well as gifts for the participants. Interviewers were

asked to contact the owners or managers of known gay clubs and bars and asked them to promote the study to their gay customers and encourage their participation. Local gay interviewers were also asked to approach the individual in order to verify the eligibility and explain the study purpose. The participants were ensured of the confidentiality of all information submitted during their participation and were asked to sign a consent form in order to participate in the study. Participants were asked to fill out a confidential self-administered iPad questionnaire in a quiet place at gay bars or clubs. The survey was conducted during the months of August and September, 2012. The iPad survey method was used and was met with considerable positivity and interest, and allowed for confirmation of both time and place of the interview. The questionnaire took approximately 15 minutes to complete and participants were provided with a lubricant (equivalent to US \$20) as an incentive. A total of 944 individuals participated in this survey. Twenty-three invalid questionnaires (i.e., men who had not had any relationships with other men and others who were not from the correct age group) were excluded, and 921 individuals remained in the final analysis.

The ethical considerations of this study were approved by the Seoul National University Institutional Review Board, and an Institutional Review Board number was issued to conduct the study.

2.2. Instruments

After an in-depth consultation with several leading members of various professional HIV/AIDS groups in the community, the Ministry of Health and Social Welfare, as well as other LGBT organizations within Korea, a brief survey consisting of 70 questions was developed. Participants were able to complete the questionnaire in just 7–8 minutes. It included questions regarding the individuals’ demographics, HIV/AIDS knowledge, HIV/AIDS stigma, HIV/AIDS-related discrimination and HIV/AIDS phobia scale, optimism bias, self-efficacy for condom use, and sexual practices. Many of the questions used were taken from the National HIV/AIDS Knowledge Attitudes and Practices Survey.

2.2.1. Sociodemographics factors

Participants were asked to specify their age (19–59 years), education (high school graduate, 2-year college graduate, or 4-year college graduate), occupation (office worker, sales, self-employed, or other), income, and sexual identity (bisexual, homosexual, or other).

2.2.2. HIV/AIDS-related knowledge

HIV-related knowledge was assessed using five questions. Each item called for one of three possible responses (True, False, or Don’t know) with the correct response scored as 1 and incorrect response as 0. For

respondents who answered “Don’t know,” answers were combined with incorrect answers on the scale questions. Participants were asked questions about whether they thought it possible for an HIV/AIDS-positive individual to appear healthy; whether they thought that avoiding sexual intercourse with such individuals could lessen the risk of transmission; whether they felt condom use made any difference in the risk of transmission; whether they believed that, with proper treatment, HIV/AIDS-positive individuals could live for up to 20 years beyond onset of infection; whether they felt it was possible to become infected following a mosquito bite; as well as whether use of the same glass as an infected individual could result in virus transmission. The sum score was used as a composite index ranging from 0 to 5, with a high score indicating a high level of HIV knowledge.

2.2.3. Stigmatizing attitudes toward people with HIV/AIDS

Reasons behind not getting tested can often stem from stigmatizing attitudes toward people with HIV/AIDS (PWHAs) themselves. HIV/AIDS stigmatizing attitudes were measured using a 5-point Likert scale, ranging from “strongly agree (5)” to “strongly disagree (1).” It included questions such as “HIV/AIDS makes me feel disgusting” and “I can share a meal with a person infected with HIV.” The scale stigmatizing attitudes toward PWHAs consisted of seven items. All questions now equate higher scores with higher stigmatizing attitudes. The Cronbach α value was 0.78, suggesting a satisfactory level.

2.2.4. Fear of HIV disease

To create the HIV/AIDS phobia scale, three questions were taken from the Multicomponent AIDS Phobia Scale [14] and translated into Korean. Questions were graded on a 5-point Likert scale, and answers ranged from 1 (Strongly disagree) to 5 (Strongly agree). Answers were combined creating the HIV/AIDS phobia scale, with higher values indicating a higher degree of phobia. The Cronbach α value showed a moderate reliability of 0.66.

2.2.5. Exposure of public relations of HIV/AIDS prevention

A number of questions about condom use were also included. Questions were aimed at determining what effect, if any, previous condom reception had on participants’ sexual behavior.

2.2.6. Self-efficacy

Four questions were asked concerning the respondents’ degree of agreement regarding safe sex. Answers ranged from 1 (Strongly disagree) to 5 (Strongly agree). The question “Is it difficult to talk about condom use with one’s partner?” was reverse

coded, and answers to each item were combined to generate the scale toward self-efficacy for safer sex, with higher values indicating a higher level of self-efficacy. The Cronbach α value showed a moderate reliability of 0.67.

2.2.7. HIV testing related behavior

HIV testing related behavior was assessed by asking whether they had ever had an HIV test. If a participant answered “Yes,” they were asked further questions about the time, place, and reasons for not having had an HIV test, if any. Respondents were then asked to indicate whether they had been tested within the past year, past 2 years, or 2 or more years prior to being surveyed. Participants were asked to choose from five general reasons—Voluntarily, Treatment/Operation, Health Checkup, Blood Donation, or Other—to determine their reasons behind getting tested. Participants were asked about their willingness to undergo HIV testing in the future.

2.2.8. Accessibility of HIV test

Accessibility of Health Services was appraised by asking participants if they knew of a place where they could access an HIV test.

2.3. Statistical analysis

All data were analyzed using Stata 12.0 by Stata-Corp LP (USA). For descriptive purposes, the portion, mean, and standard deviations of the study sample were all examined. Bivariate analyses were used to examine the differences in factors between MSM who had already had an HIV test and MSM who had never had an HIV test. Multivariable logistic regressions were used for analysis of factors affecting HIV testing behavior. Variables that were statistically significant in the bivariate regression analyses were retained in the multivariable logistic regression models. The final multivariable model controlled for age, education, marital status, and sexual identity variables showing significant ($p < 0.05$) association with the outcome of interest, were reported by presenting the adjusted odds ratios (ORs) and p values.

3. Results

3.1. Characteristics of respondents in South Korea

The mean age of the respondents was 33.2 (standard deviation = 10.1) years, and most respondents were younger, between the ages of 19 years and 29 years (52.0%). The majority of respondents had finished studying in a 4-year college or had gone on to pursue a higher level of education (54.4%). The majority of respondents were never married (89.7%) or married/divorced (10.3%). Most respondents self-

identified as homosexual (87.4%) or bisexual (0.9%). A certain percentage also identified as heterosexual (11.7%).

The number of participants who responded “other” or “don’t know” to survey questions was very small ($N = 42$). These individuals were most likely bisexual. Although the majority of respondents reported never having formally “come out” (80.1%), a much smaller percentage reported having come out voluntarily (16.7%). An even smaller percentage reported having been “outed” by others (3.2%). Finally, when asked whether they had received any form of HIV/AIDS prevention literature or had been exposed to any sort of educational publicity, 70.9% ($N = 653$) responded “yes,” whereas 29.1% ($N = 368$) reported having had little to no exposure at all (Table 1).

3.2. Sexual behavior

Up to 14.7% ($N = 136$) of individuals reported having had six or more partners within the 6-month period prior to their participation in this survey, whereas 35.3% ($N = 325$) of individuals reported having had between two and five different partners within the past 6 months. Individuals who reported having six or more partners made up 14.7% ($N = 136$) of the total. Among 685 individuals, 58.5% ($N = 401$) reported having used a condom during their last sexual encounter. When asked about their history of sexually transmitted infections (STIs), 11.2% ($N = 103$) reported having ever had an STI, whereas, among that same group, 1.2% ($N = 11$) reported actually having been diagnosed with HIV (Table 2).

3.3. HIV testing behavior

As shown in Table 3, approximately 61.8% ($N = 569$) of respondents reported having been tested at least once in their lifetime, and 38.9% ($N = 358$) indicated that they had been tested within the 12 months prior to their participation in the survey. Among that same group, a significant group of respondents reported having sought testing voluntarily (61.5%; $N = 350$). A smaller group reported having sought testing as part of a routine medical health checkup 19.3% ($N = 110$). The remaining groups reported having sought testing prior to receiving some form of medical treatment or operation 9.0% ($N = 51$), prior to giving blood 7.9% ($N = 45$), or for some other unstated reason 2.3% ($N = 13$).

A good majority of respondents reported being aware of a place where they could seek testing (88.4%; $N = 814$), whereas a significant number reported not knowing of a place where they might seek testing (11.6%; $N = 107$). When respondents of that same group were asked how willing they might be to actually go to a testing site and seek HIV testing, a smaller yet still significant group (82.8%) reported some level of willingness to do so: as before, a small percentage of this group comprised individuals (17.2%) who were unsure whether they would be willing to actually seek testing, despite having knowledge of a testing site.

3.4. Factors affecting HIV testing behavior

In the regression table shown below (Table 4), both demographic and contextual variables (age, education, number of partners, and history of condom use), attitude (discrimination, fear, and condom self-efficacy), and

Table 1. Sociodemographic data of MSM respondents in South Korea ($N = 921$).

Characteristics		N	%
Age (y)	Mean (SD)	33.2 (10.1)	
	19–29	479	52.0
	30–39	253	27.5
	40–49	142	15.4
	50–59	47	5.1
Education	High school and less	281	30.5
	2 y college	139	15.1
	4 y college and higher	501	54.4
Marital status (heterosexual)	Single (Never married)	826	89.7
	Married/Separated/Widowed	95	10.3
Sexual identity	Bisexual	92	10.0
	Homosexual	805	87.4
	Heterosexual/undecided	24	2.5
Coming out	Voluntarily	179	16.7
	By others	34	3.2
Exposure to HIV/AIDS Prevention Campaign	Haven’t come out	857	80.1
	Yes	653	70.9
	No	268	29.1
Total		921	100.0

HIV = human immunodeficiency virus; MSM = men who have sex with men; SD = standard deviation.

Table 2. HIV testing related behavior.

Characteristics		<i>N</i>	%
Number of partners (past 6 mo)	0	157	17.0
	1	303	32.9
	2–5	325	35.3
	6 and more	136	14.7
Condom use ^a (<i>N</i> = 685) (at last sexual encounter)	Yes	401	58.5
	No	284	41.5
Reported STIs	Yes	103	11.2
	No	818	88.8
Reported HIV	Yes	11	1.2
	No	838	91
	Not Sure	72	7.8
Total		921	100.0

^aPersons having had one and more partners in the past 6 months. HIV = human immunodeficiency virus; STI = sexually transmitted infection.

HIV knowledge (awareness of a testing location and exposure to HIV Prevention Campaigning) were assessed. First, in Model I, we find that the number of partners one has seems to play a significant role in one's tendency to seek testing; 1.63 times higher than that of individuals who reported having only one to two partners. Condom use was not found to be significant in prediction of individuals' tendency to seek testing. In Model II, individuals who had greater knowledge and had experienced less discrimination were 1.18 times more likely to seek testing, whereas those who were more aware of existing discrimination showed a negative correlation with testing. Furthermore, the greater the fear, the more likely individuals were to seek testing. No relation was found between individuals' condom self-

efficacy and their likelihood to seek testing. Finally, in Model III, individuals who reported actually knowing of a place where they could get tested for HIV were 4.04 times more likely to seek testing than individuals who were unaware of a testing location ($p < 0.001$). Moreover, individuals who had been exposed to some sort of HIV prevention campaigning were 1.54 times more likely to have sought or undergone testing ($p < 0.05$).

4. Discussion

This study, conducted as the first of its kind, comprised a large, randomly selected sample of MSM. These individuals were recruited using the TLS

Table 3. Sexual activity and HIV testing.

Characteristics		<i>N</i>	%
HIV testing (lifetime)	Yes	569	61.8
	No	352	38.2
HIV testing (past year)	Yes	358	38.9
	No	563	61.1
Reason for testing	Tested voluntarily	350	61.5
	Prior to surgery	51	9.0
	General health screening	110	19.3
	Blood donation	45	7.9
HIV testing site type	Other	13	2.3
	Hospital	244	42.9
	Health center	153	26.9
	HIV counseling center	106	18.6
	Red cross center	46	8.1
Awareness of testing site	Other	20	3.5
	Yes	814	88.4
Willingness to undergo HIV test	No	107	11.6
	Yes	763	82.8
	No	158	17.2

HIV = human immunodeficiency virus.

Table 4. Factors affecting HIV testing behavior.

		Model 1		Model 2		Model 3	
		β	OR	β	OR	β	OR
Age (y)	19–29 (ref.)						
	20–29	0.225	1.25	0.119	1.13	0.107	1.11
	30–39	0.074	1.08	–0.014	0.99	–0.128	0.88
	40–49	0.230	1.26	0.357	1.43	0.407	1.50
Education	High school and less (ref.)	—	—	—	—	—	—
	2 y of college	0.290	1.34	0.249	1.28	0.258	1.29
	4 y college and more	0.285	1.33	0.100	1.11	0.063	1.07
Number of partners	2 and less (ref.)	—	—	—	—	—	—
	3–5	–0.133	0.88	–0.177	0.84	–0.216	0.81
	6 and more	0.490	1.63 *	0.319	1.38	0.221	1.25
Condom use	No (ref.)	—	—	—	—	—	—
	Yes	0.139	1.15	0.017	1.02	–0.016	0.98
HIV knowledge				0.169	1.18 *	0.132	1.14
Discrimination				–0.074	0.93 ***	–0.065	0.94 ***
Fear				0.120	1.13 **	0.122	1.13 **
Condom self-efficacy				0.064	1.07	0.053	1.06
Awareness of testing place						1.397	4.04 ***
Exposure to HIV prevention campaigning						0.433	1.54 *

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. HIV = human immunodeficiency virus; OR = odds ratio; ref. = reference group.

sampling and survey method. As in any society, owing to stigmatization and the potential for discrimination, recruiting individuals from a hidden population such as this one is often very difficult. Therefore, rather than attempting to recruit individuals by sampling location, TLS was used to gather a statistically viable representative sample of MSM.

Similar to results found in previous studies, knowledge, attitude, number of sexual partners, and condom use were all found to have a significant effect on individuals' likelihood to seek testing. Related studies conducted on MSM where knowledge and attitude were assessed found that individuals were more likely to seek testing once they were made aware of a place where they could seek testing and once they were assured that the confidentiality of their result would be maintained. In addition, both discrimination and knowledge were contributing factors in individuals' decision to seek testing. Where knowledge is concerned, very low perception of individual risk was observed, and more than half of that group stated that they would have sought testing earlier had they known they were at risk [15].

This study further reiterates the desperate need for HIV/AIDS education for MSM and the minimization of discrimination within the Korean population. Any HIV/AIDS prevention programs should include information providing direction to testing centers where anonymous testing can be facilitated. Evidence of this can be seen in one systematic review where improved perception showed positive correlation with individuals' likelihood

to seek testing. Where knowledge and perception are lacking, testing behavior is much less often sought [16]. This, of course, leads to individuals' tendency to miss out on earlier treatment initiation, shorter life spans, and further transmission of the virus to other individuals.

Fear, too, is often a significant barrier in individuals' testing behavior. Individuals experience fears of being "outed," of further discrimination, and even a positive test result. This is evident in the 2004 Glasgow study, which assessed the intention of gay men in taking the HIV test. Here, for MSM who had recently engaged in unprotected anal sex, their intention to actually seek testing weakened in the presence of increased fear of a test result that is positive for HIV [12].

In this study, >17% of individuals expressed that they did not intend to seek testing, and only 61% of that same group reported that they had sought testing voluntarily. Although these numbers can be improved, because of obvious barriers such as stigma and discrimination toward MSM, individuals' likelihood to seek testing is naturally stifled. In 2012, a study was conducted to assess the effectiveness of VCT in Brazil. During this time, a trend of new cases had begun to be identified in individuals under the age of 25. Despite expected regional variance found across Brazil in regard to prevalence, recent infection was reported in 25% of all cases, indicating the importance of the availability of such VCT centers. Early detection leads to more rapid intervention and greater effectiveness of treatment. In many cases, although the virus has been identified, individuals fail to seek the necessary counseling to help

them transition into treatment and avoid further undue suppression of their immune system [17]. The current near-absence of VCT centers in Korea is one of the most obvious barriers to HIV testing in Korea. A greater availability of VCT centers in cities across Korea would no doubt have similar positive effects on local high-risk populations such as MSM.

Equal, if not greater, effects have been observed through the use of point-of-care testing (PCT) as in the 2008 UK study. The study was conducted on new incoming patients visiting local genitourinary medicine clinics who had otherwise refused HIV testing as part of their normal workup to determine why patients decline HIV testing at visitation. When anonymously surveyed regarding their reasons for refusal of testing, 77.1% of all high-risk patients reported a willingness to participate in PCT, an overwhelming number compared to the 65.8% among regular patients [18]. Upon provision of PCT for use as a form of rapid HIV testing in Korea, it is highly possible that high-risk patients at hospitals and clinics may show an equally positive response. Although this form of testing is not yet available in Korea, the country's first trial run is now underway to appraise its contextual effectiveness followed by an official release of the product OraQuick into pharmacies across the country. In this study, approximately 12% reported not even knowing where they could access HIV testing. Establishment of a point-of-care testing system in Korea then becomes a partial solution worthy of further exploration for high-risk groups otherwise refusing testing.

Although preparation has already been made for products such as OraQuick to be made available for purchase in countries such as the United Kingdom and the Philippines, pharmaceutical companies in Korea have yet to apply for the license to obtain such products. A version of this product was approved for use in the United States by trained technicians in clinical settings back in 2004 and made available for over-the-counter purchase by 2012 [19]. OraQuick, a product praised for its high sensitivity, not only has the ability to detect an individual's viral load within the 3-month "window period," but was reported to perform better than ordinary antibody tests [20]. Following the completion of the trial period, which has already begun in Korea, OraQuick may also become available for the first time in Korea in the near future.

Approximately 42% of the participants in this offline study reported not having used a condom in their last sexual encounter. Although failure to use a condom during sexual intercourse contributes to the likelihood of partner-to-partner HIV transmission, if appropriate education tactics are applied to such high-risk groups, it has been proven that the self-efficacy use of a condom can be greatly improved, effectively reducing the potential for transmission and subsequent infection [3].

Several recommendations can be made to improve the quality of perceived risk, knowledge, attitude, and self-efficacy of condom use for high-risk MSM individuals [21]. For improved knowledge of risk associated with unprotected sex as well as improved use of condoms for sexual intercourse among MSM, education informing MSM of the routes by which HIV can be transmitted, emphasizing the benefits of condom use, and the importance of seeking regular testing are key points to be addressed. This is supported by approximately 40% of participants who reported never having been tested in their lifetime, 12% in the offline study who reported having no idea where they could seek testing, and 42% who reported no intention to get tested—all evidence of a lack of intention and education. The effects of intentional targeting of these areas—perceived risk, knowledge, attitude, and condom self-efficacy—could lead to a healthier and safer community of MSM within Korea and a decrease in the overall number of infections per year.

Some of the limitations of this study included the exclusion of individuals who do not go to gay bars. Because a small percentage of MSM actually go out to gay venues where data were collected, results and conclusions of this study cannot be generalized for all MSM living in Korea. Another limitation is the characteristics of those who go out compared with those of individuals who do not go out. Once again, the characteristics of individuals who go out cannot be generalized for all MSM living in Korea because it only accounts for a small percentage of the MSM population living in Korea.

As a form of education, distribution of brochures and other forms of publicity in gay friendly and gay-populated areas containing information about counseling and testing is advisable. As a result, MSM can then be encouraged to seek testing at these locations, build relationships with staffers there, and grow more comfortable with the HIV testing process. To improve the accessibility of testing centers to high-risk groups such as MSM, the launch of more departments and centers where individuals can access HIV testing would result in better outcomes for MSM. Upon locating any of the advertised VCTs, further distribution can occur with regard to condoms and lube, and appropriate access to counseling can be provided.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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