



Use of Smartphone to Seek Sexual Health Information Online Among Malaysian Men Who Have Sex with Men (MSM): Implications for mHealth Intervention to Increase HIV Testing and Reduce HIV Risks

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Abstract

In settings where stigma and discrimination toward men who have sex with men (MSM) are high or illegal, like in Malaysia, innovative methods to anonymously reach them are urgently needed. The near ubiquitous availability of mobile technology, including smartphones, has the potential to open new frontiers (such as mHealth) to prevent HIV and other sexually transmitted infections (STIs). The extent to which MSM use mHealth tools for HIV and STI prevention in the Malaysia context, however, is unknown. A cross-sectional online survey in 622 Malaysian MSM was conducted between July and November 2017. Participants were recruited via advertisements on mobile apps frequently used by MSM. In addition to demographic, smartphone access and utilization, and other information were assessed using logistic regression to determine factors associated with the use of a smartphone to search for online sexual health information. Nearly all (99.2%) participants owned a smartphone, with 63% reported having used one to seek sexual health information, including HIV/STIs. Overall, 96% used smartphones to find sexual partners, with high levels of HIV risk behavior reported. Independent correlates of smartphone use to seek online sexual health information included older age (aOR 0.943, $p=0.005$), higher education (aOR 2.14, $p=0.027$), recent (past year) HIV testing (aOR 3.91, $p=0.026$), and seeking sexual partners using geosocial networking apps (aOR 5.58, $p=0.006$). These findings suggest high smartphone use by high-risk MSM to seek sexual health information and suggests that mHealth strategies may be an effective strategy to engage MSM in HIV prevention activities.

Keywords HIV · Men who have sex with men · mHealth · Smartphone · Malaysia

Introduction

Despite reductions in HIV incidence globally, HIV transmission among men who have sex with men (MSM) continues to increase markedly [5, 45], especially where sex between men remains highly stigmatized or illegal [37–39]. Malaysia, a middle-income country with low (0.4%) overall HIV prevalence, has an evolving epidemic in MSM with new HIV cases increasing from 10% in 2008 to 54% in 2016 [33]. Biobehavioral surveys now suggest that HIV prevalence among MSM is now at an all-time high of 21.6%, and is concentrated in the country's capital, Kuala Lumpur, where HIV prevalence among MSM was 43% in 2018, up from 22% just four years before [34]. This growing epidemic among MSM has been associated with condomless sex (CS) and concomitant use of drugs and alcohol [21, 25, 26, 28].

In Malaysia, homosexuality is illegal in both secular and Sharia law. Even when criminal sanctions are not

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enforced, MSM are highly stigmatized and often discriminated against. Consequently, reaching MSM in general, and certainly, those not identifying as “gay”, has been especially challenging with HIV prevention services [25, 27]. Traditional outreach at venues where MSM congregate has been challenging. For example, gay clubs are unviable option because of highly publicized police raids of such establishments with the press airing footage of MSM being forced to submit to urine drug testing or even pronouncements against lesbian, gay, bisexual, and transgender (LGBT) persons by leading governmental authorities, including to smear leading public figures seeking election. Consequently, innovative strategies to prevent HIV in MSM must not only be tailored to the context but must be adequately scaled-to-need [4, 46].

The unprecedented expansion of mobile technologies, especially in emerging economies, as well as their potential application to reach groups who are not accessible using venue-based strategies, has opened new frontiers, including mHealth strategies, to promote personal healthcare engagement, including optimized prevention and treatment [8, 9, 19, 30]. The enthusiasm about mHealth stems from its ability to address perennial barriers to healthcare access like cost, infrastructure, and accessibility [2, 23]. mHealth strategies in systematic reviews have documented benefits for impact on medication adherence [1, 12, 35], appointment attendance [13, 18, 35], and health-promoting behaviors [13, 18, 22, 40] in various patient groups across diverse settings. Thus, if found to be acceptable and made accessible, mHealth interventions have the potential to overcome known barriers to accessing HIV prevention and treatment services among Malaysian MSM and overcome existing barriers to prevention.

Adoption of smartphones has grown rapidly with 75.9% of Malaysians owning one by 2017. Furthermore, in 2017, there were 24.5 million Internet users with smartphones being the most common device accessing the Internet (89.4%) [31, 32]. The extent to which MSM, especially high-risk MSM in Malaysia use smartphones and the internet, however, is unknown and assessment of their use and interest in using smartphones to access prevention information might provide new insights into reaching this hidden population in Malaysia. Specifically, there has not been an empirical study on the use of mHealth technology to seek sexual health information among Malaysia MSM. Understanding the characteristics of technology users will help us develop appropriate interventions for MSM who use smartphone technology to seek online HIV/sexually transmitted infection (STI) information. Therefore, we analyzed data from an online study among Malaysian MSM assessing HIV testing to investigate the characteristics of smartphone users and the use of a smartphone to seek online sexual health information, including HIV/STI.

Methods

Study Design and Participants

A cross-sectional study assessing HIV testing practices among MSM in Malaysia was conducted from July to November 2017. Inclusion criteria were: (i) 18 years or older; (ii) identifies as male; (iii) Malaysian citizen; (iv) reporting recent (last 12 months) condomless anal sex with another man; and (v) able to read and understand English or Bahasa Malaysia.

Study Procedures

A convenience sample of MSM was recruited via advertisements on Grindr, the most commonly used social networking apps that MSM use, by providing banner promoting the survey. Interested app users who clicked on advertisements were directed to an eligibility screener hosted by RedCap [17]. Each eligible participants voluntarily completed an online consent form by acknowledging that they understood the purpose, risks, and benefits of the study prior to completing the survey. On average, participants took 15–20 min to complete the anonymous online survey. The questionnaire was available in both English and Malay languages and was translated and back-translated to ensure culture meaning [7]. No payments were made for completing the surveys.

The primary study was approved by the Medical Ethics Committee of the University of Malaya.

Measures

Participant characteristics included age, ethnicity, educational status (university graduate), household status, employment status, disclosure of sexual orientation to family or friends, and self-reported history of HIV testing practices and current HIV status.

Sexual risk behaviors included the age of sexual debut, sex with regular and casual sex partners, serostatus of sex partners, consistent condom use, engagement in group sex, commercial sex and ‘chemsex’, and the use of alcohol before or during sex in a lifetime. Chemsex was defined as the use of a psychoactive substance (crystal methamphetamine/“Batu”/ice, ketamine, ecstasy, and gamma hydroxybutyrate “G”) before or during anal intercourse [11, 43, 44].

Perceived *social support* was measured by a 12-item short version of the original 24-items Social Provisions Scale, which assesses the perceived availability of tangible, informational, emotional, and esteem support [10]. The overall score was obtained by summing responses to

all items with higher scores indicating higher perceived social support ($\alpha = 0.89$).

Depressive symptoms over the previous week were assessed using the 20-item Center for Epidemiological Studies Depression (CES-D) scale [41]. The total sum score ranges from 0 to 60, with standard cut-offs of ≥ 16 associated with moderate to severe depression ($\alpha = 0.87$).

Interpersonal violence (IPV) was assessed by asking the participants whether have been the victim of IPV in lifetime, including if they had been ‘hurt, hit, or slapped by a steady or casual partner’, ‘being forced by a steady or casual partner to have sex’, ‘being forced by a person who is not a steady or casual partner to have sex’, or ‘being fondled or forced into unwanted sexual touching (e.g. touch or grope in a way that person does not want)’. Lifetime IPV was indicated by a positive answer to any of the above items.

Smartphone Access or Use

Participants were asked about their access to a smartphone and the utilization of the internet on a smartphone for various activities (e.g., general information search, information search related to sexual health, information search on clinic health care providers, communication with friends and family, to find sexual partner, entertainment, education purpose). Participants were further asked about their use of various social networking apps (e.g., Facebook, Twitter, Instagram) as well as geosocial networking apps (GSN) commonly used by MSM (e.g., Grindr, Blued, PlanetRomeo, Jack’d) on their phone. They were also asked if they used a smartphone to seek sexual health information online, including HIV and STIs.

Data Analysis

Analyses were performed using SPSS 23.0. The primary outcome was smartphone use to seek sexual health information. Estimates were evaluated for statistical significance based on 95% confidence intervals using $p < 0.05$. We computed descriptive statistics, including frequencies and percentages for categorical variables and means, standard deviations, and ranges for continuous variables. After conducting bivariate logistic analyses for significant associations with the primary outcome (use of a smartphone to seek sexual health information), we conducted parsimonious multivariate logistic regression analyses by including variables on bivariate associations significant at $p < 0.10$. Collinearity between variables was assessed using the variance inflation factor (VIF > 10).

Results

Participant Characteristics

Table 1 provides summary data for the 622 MSM (mean age = 28.2, range 18–64 years) who provided complete data, most of whom were Malay (66.7%), university graduates (78.6%), currently employed (75.7%), and reported to have disclosed their sexual orientation to family or friends. Overall, 239 (38.4%) participants had never tested for HIV, and 44.5% reported to have tested for HIV in the past 12 months. Of the total participants, 24.3% reported being HIV positive, and 60.8% met screening criteria for having moderate to severe depression.

In terms of sexual behaviors, 43.2% of participants reported having a regular sex partner in the past 3 months, with 7.4% of them being in an HIV serodiscordant relationship. Over two-thirds (66.7%) had casual sex partners, and over 45% have engaged in inconsistent condom use in the past 3 months. A minority (6.4%) reported having ever engaged in Chemsex, and 41% reported to have engaged in group sex. Interestingly, nearly all of the participants (96%) reported having ever used a GSN app to find sexual partners (Table 1).

Ownership of and Utilization of Smartphone

Figure 1 describes smartphone use characteristics. Nearly all participants (99.2%) reported owning a smartphone. Social networking apps (e.g., Facebook, Grindr, Blued, PlanetRomeo; 88.1%), followed by general information searches (86%) and communication with friends and family (80.2%) were the most common reasons for using the internet on a smartphone. Almost two-thirds (63%) of participants reported smartphone use to search for information on sexual health, including HIV/STIs, and 28.8% for information search on finding clinic or healthcare providers. In terms of the use of social networking apps, the majority of the participants reported the current use of Facebook (85.9%) and Instagram (73.5%). Similarly, the majority of participants (78.1%) used at least one GSN app to talk with or meet other men. Figure 2 shows GSN app use among participants who reported having ever used a GSN app. Grindr (72.5%) was the most commonly used app, followed by Blued (25.9%), PlanetRomeo (16.7%), and Jack’d (14.1%); increased use of Grindr may be related to recruitment.

Table 1 Characteristics of participants and sexual behaviors, stratified by smartphone use to seek sexual health information (N = 622)

Variables	Entire sample (N = 622) Frequency (%)	Use of smartphone to seek sexual health information		Unadjusted OR (95% CI)	p value
		No (n = 230)	Yes (n = 392)		
Characteristics of participants					
Age (years): mean (SD, range)	28.2 (6.9, 18–64)	29.1 (8.3)	27.6 (5.9)	0.971 (0.949, 0.994)	0.012
Ethnicity					
Malay	415 (66.7)	156 (25.1)	259 (41.6)	–	–
Indian	120 (3.0)	44 (7.1)	76 (12.2)	1.040 (0.683, 1.585)	0.854
Chinese	29 (4.7)	11 (1.8)	18 (2.9)	0.986 (0.454, 2.141)	0.971
Other	58 (9.3)	19 (3.1)	39 (6.3)	1.236 (0.690, 2.215)	0.476
University graduate^a					
No	133 (21.4)	64 (10.3)	69 (11.1)	–	–
Yes	489 (78.6)	166 (26.7)	323 (51.9)	1.805 (1.224, 2.661)	0.003
Household status					
Family	278 (44.7)	106 (17.0)	172 (27.7)	–	–
Friends	145 (23.3)	49 (7.9)	96 (15.4)	1.207 (0.793, 1.839)	0.380
Regular partner	67 (10.8)	28 (4.5)	39 (6.3)	0.858 (0.499, 1.477)	0.581
Alone/others	132 (21.2)	47 (7.6)	85 (13.7)	1.115 (0.725, 1.715)	0.622
Currently employed					
No	151 (24.3)	58 (9.3)	93 (15.0)	–	–
Yes	471 (75.7)	172 (27.7)	299 (48.1)	1.084 (0.743, 1.582)	0.675
Ever had HIV test					
No	239 (38.4)	113 (18.2)	126 (20.3)	–	–
Yes	383 (61.6)	117 (18.8)	266 (42.8)	2.039 (1.460, 2.848)	<0.001
HIV status n = 383					
Negative	290 (75.7)	105 (27.4)	185 (48.3)	–	–
Positive	93 (24.3)	12 (3.1)	81 (21.1)	3.831 (1.996, 7.352)	<0.001
Social support: mean (SD, range)	36.2 (6.3, 12–48)	36.1 (6.1)	36.3 (6.4)	1.005 (0.979, 1.031)	0.716
Moderate to severe depression					
No	244 (39.2)	94 (15.1)	150 (24.1)	–	–
Yes	378 (60.8)	136 (21.9)	242 (38.9)	1.115 (0.800, 1.555)	0.521
Victim of IPV					
No	469 (75.4)	183 (29.4)	286 (46.0)	–	–
Yes	153 (24.6)	47 (7.6)	106 (17.0)	1.443 (0.977, 2.132)	0.066
Disclosure of sexual orientation					
No	129 (20.7)	52 (8.4)	77 (12.4)	–	–
Yes	493 (79.3)	178 (28.6)	315 (50.6)	1.195 (0.804, 1.777)	0.379
Sexual behaviors					
Age of sexual debut: mean (SD, range)	17.3 (3.8, 7–21)	17.4 (3.7)	17.3 (3.8)	0.998 (0.956, 1.042)	0.924
Sex with regular partner					
No	353 (56.8)	138 (22.2)	215 (34.6)	–	–
Yes	269 (43.2)	92 (14.8)	177 (28.5)	1.235 (0.887, 1.718)	0.211
Serodiscordant relationship n = 269					
No	249 (92.6)	89 (33.1)	160 (59.5)	–	–
Yes	20 (7.4)	3 (1.1)	17 (6.3)	3.152 (0.899, 11.051)	0.073
Sex with casual partner (past 12 months)					
No	207 (33.3)	91 (14.6)	116 (18.6)	–	–
Yes	415 (66.7)	139 (22.3)	276 (44.4)	1.558 (1.107, 2.193)	0.011
Consistent condom use (past 3 months)					
No	338 (54.3)	132 (21.2)	206 (33.1)	–	–

Table 1 (continued)

Variables	Entire sample (N=622) Frequency (%)	Use of smartphone to seek sexual health information		Unadjusted OR (95% CI)	p value
		No (n=230)	Yes (n=392)		
Yes	284 (45.7)	98 (15.8)	186 (29.9)	1.216 (0.876, 1.688)	0.242
Condom use (last sex)					
No	368 (59.2)	143 (23.0)	225 (36.2)	–	–
Yes	254 (40.8)	87 (14.0)	167 (26.8)	1.220 (0.874, 1.703)	0.242
Ever engaged in group sex					
No	367 (59.0)	151 (24.3)	216 (34.7)	–	–
Yes	255 (41.0)	79 (12.7)	176 (28.3)	1.557 (1.112, 2.182)	0.010
Ever engaged in commercial sex					
No	468 (75.2)	175 (28.1)	293 (47.1)	–	–
Yes	154 (24.8)	55 (8.8)	99 (15.9)	1.075 (0.736, 1.571)	0.708
Meets sexual partners via GSN apps					
No	25 (4.0)	17 (2.7)	8 (1.3)	–	–
Yes	597 (96.0)	213 (34.2)	384 (61.7)	3.831 (1.626, 9.025)	0.002
Ever engaged in chemsex					
No	482 (77.5)	190 (30.5)	292 (46.9)	–	–
Yes	140 (6.4)	40 (6.4)	100 (16.1)	1.627 (1.080, 2.450)	0.020
Drink alcohol before or during sex					
No	486 (78.1)	179 (28.8)	307 (49.4)	–	–
Yes	136 (21.9)	51 (8.2)	85 (13.7)	0.972 (0.656, 1.440)	0.886

SD standard deviation, IPV intimate partner violence, GSN geosocial networking, OR Odds ratio, CI confidence interval

^aIncludes college, university, professional degree

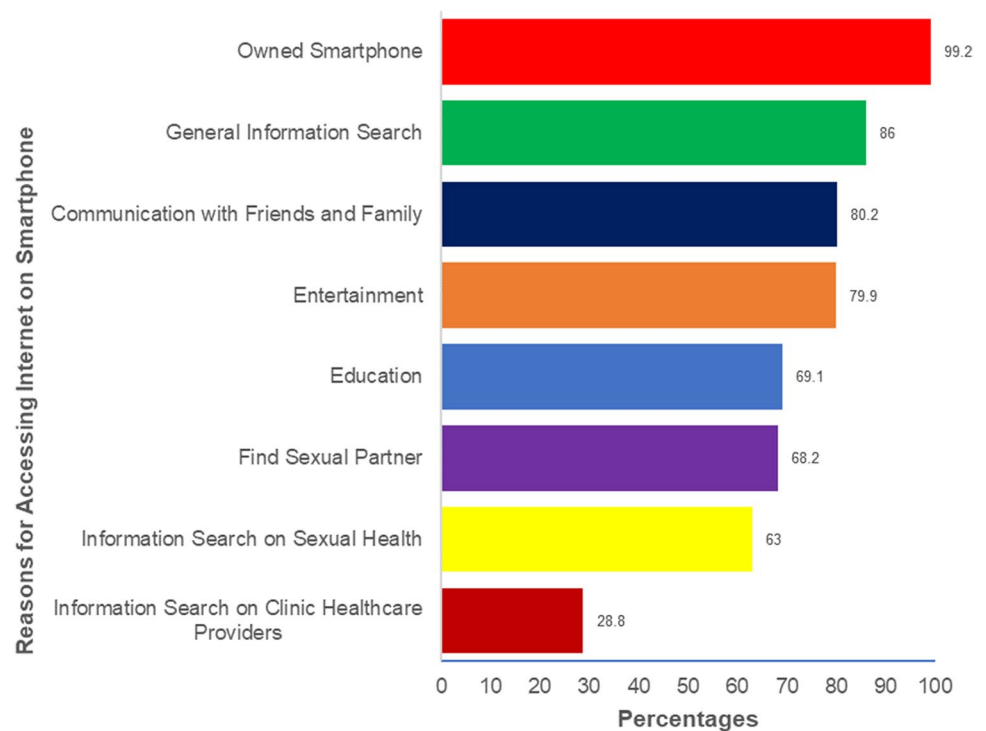
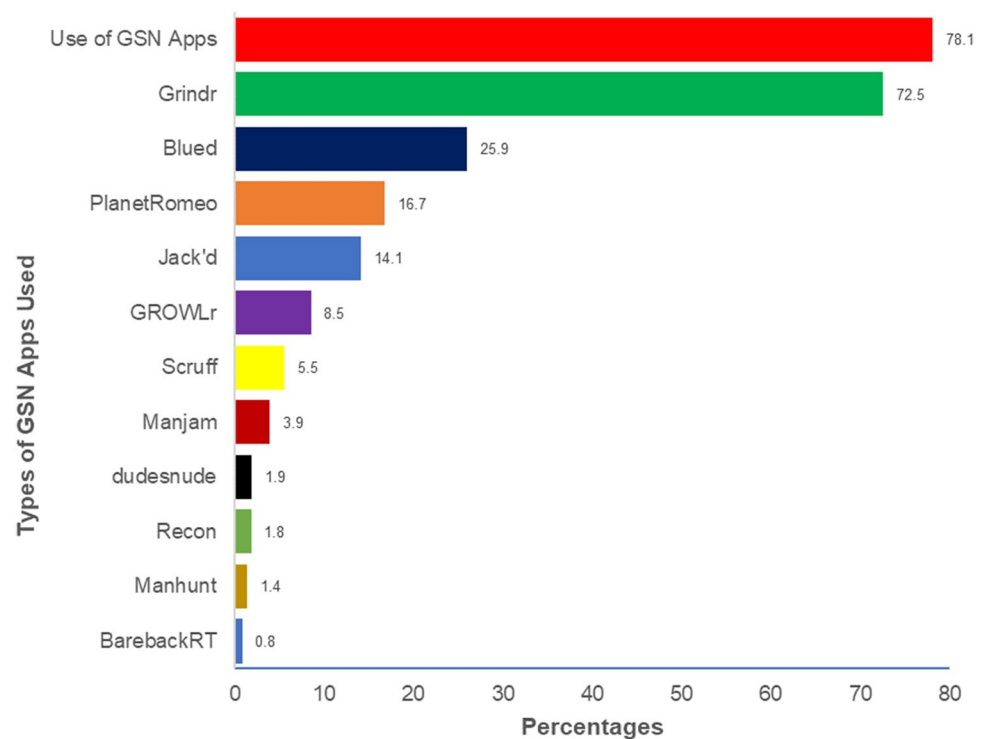
Fig. 1 Ownership of and utilization of smartphone among study participants (N=622)

Fig. 2 Use of different geosocial networking (GSN) apps by the study participants ($N=622$). GSN geosocial networking



Correlates of Smartphone Use to Find Sexual Health Information Online

Table 1 shows the bivariate correlates and odds ratio of sexual health information seeking through a smartphone. Of note, factors associated with using a smartphone to find sexual health information were being younger ($p=0.012$), a university graduate ($p=0.003$), having ever tested for HIV ($p<0.001$), having engaged in chemsex ($p=0.020$), and having sought sexual partners via an online app ($p=0.002$). In the multivariate logistic regression model, being a university graduate (aOR 2.13, $p=0.027$), having tested for HIV (aOR 3.91, $p=0.026$), and having met sexual partner via online GSN app (aOR 5.58, $p=0.006$) were more likely to use a smartphone to seek sexual health information online. Meanwhile, older age were associated with lower use of a smartphone to search for sexual health information (aOR 0.94, $p=0.005$) (Table 2).

Discussion

To our knowledge, this is the first study to assess smartphone use in Malaysian MSM, a setting where MSM are stigmatized and discriminated against and consequently difficult to reach with effective HIV prevention. This study provides important insights into the use of smartphone technology by MSM in Malaysia, specifically to seek sexual health information online about HIV and STIs. Specifically, the use of a

smartphone to find online sexual health information, including information on HIV and STIs, was a common practice among this sample. This finding is similar to that observed among MSM in Hanoi, Vietnam [36]. Our results further suggest the prevalent use of social networking apps to socialize and find sex partners among our sample – not surprising since MSM were recruited in part from GSN apps. This is much higher than those reported with MSM elsewhere [14, 15, 24, 42, 47, 48]. This finding is particularly important in the Malaysian context where there are limited physical venues for MSM to meet face-to-face, socialize and even to seek healthcare since homosexuality is illegal—a consequence of the increasingly hostile socio-political environment facing LGBT people in Malaysia. With a large proportion of Malaysian MSM utilizing smartphones to seek sexual partners and sexual health information, prevention programs need to be tailored to these contexts that increase the use of anonymous interfaces and reduce “in person” interventions.

Though reported previously [21, 26, 28, 29], MSM in our sample also faced several vulnerabilities to HIV, including inconsistent condom use during sex and engagement in commercial sex, chemsex, and group sex, but at higher levels than previously reported, supporting the evolving HIV epidemic in MSM. The large proportion of MSM at substantial risk for acquiring HIV infection and underutilization of available HIV prevention services, as evident in our sample, partly explain an increasing HIV incidence among MSM in Malaysia. These findings, thus, underscore the urgent need for enhanced primary prevention approaches aimed at more

Table 2 Independent correlates of smartphone use to seek sexual health information about HIV and sexually transmitted infections (N = 622)

Variables	Use of smartphone to seek sexual health information (HIV, STIs)		
	aOR	95% CI	p value
Age, years (continuous)	0.94	0.90 0.98	0.005
University graduate ^a			
No	Referent	–	–
Yes	2.13	1.09, 4.19	0.027
HIV testing (past 12 months)			
No	Referent	–	–
Yes	3.91	1.17, 13.01	0.026
HIV status			
Negative	Referent	–	–
Positive	1.66	0.90, 3.04	0.099
Experienced IPV			
No	Referent	–	–
Yes	1.43	0.72 2.85	0.297
Serodiscordant relationship			
No	Referent	–	–
Yes	2.27	0.49, 10.51	0.294
Ever engaged in group sex			
No	Referent	–	–
Yes	1.43	0.79, 2.58	0.226
Meets sexual partners via GSN app			
No	Referent	–	–
Yes	5.58	1.65, 18.86	0.006
Ever engaged in Chemsex			
No	Referent	–	–
Yes	1.09	0.57, 2.10	0.784

$R^2 = 19.99$

Hosmer and Lemeshow test: Chi square = 7.18; $p = 0.517$

IPV intimate partner violence, GSN Geosocial networking, aOR odds ratio, CI Confidence interval

^aIncludes college, university, professional degree

effectively and efficiently preventing HIV in this high-risk population.

The findings that younger and more educated MSM were using a smartphone to search for sexual health information online may be reflective of the population subgroups who have better access to smartphones in general and as described in previous research. Prior research has indicated that adolescents and young adults represent the ‘digital generation’ and utilize the internet as a primary source of information gathering, communication, and social networking [6, 48]. With such widespread access, younger MSM have been found to heavily utilize smartphones to gain information on sex behavior, sexuality, and sexual health [20, 24]. Furthermore, it may be that men with higher education are

more likely to have higher income [16], and that more affluent MSM are able to afford a smartphone as compared to their counterparts. These findings, along with the estimate that 35% of new infections in Malaysia occur among people 13–29 years of age [34], further emphasize the potential for smartphone-based interventions to reach the most vulnerable individuals.

Our findings reveal that a high proportion (38.4%) of Malaysian MSM in the study had never been tested for HIV prior to the study representing a gap in scale-up of HIV testing services among this vulnerable group. This finding suggests the need for interventions to scale-up routine HIV testing among MSM, including the expansion of community-based testing services and at-home HIV testing kits, and innovative online testing programs (e.g., online-to-offline model) [3]. As for MSM who had been tested for HIV, testing services could have enhanced their awareness about HIV and motivation to search for online information on prevention and care. Since specific temporal information was not collected; however, it is also plausible that having been HIV tested resulted in online health information-seeking behavior. Nonetheless, the fact that MSM who had never been tested for HIV were less likely to seek sexual health information related to HIV/STI online indicates the need for research on integrating health information, especially information related to HIV/AIDS, into the GSN apps, which are frequently used by MSM in Malaysia.

Our findings further revealed that the smartphone GSN apps are popular as a means for meeting sex partners among Malaysian MSM. This finding is consistent with previous studies, which investigated the role of GSN apps for meeting potential sex partners [14, 15, 24, 42, 47, 48]. Also, those who met a sexual partner via GSN apps were more likely to use a smartphone to search for HIV/STI information online. It is possible that individuals who seek sex partners online are making a rational judgment about their risk levels when considering whether to look for information on HIV/STI prevention and care online. Other possible reasons included their preference for online platforms via smartphone, instead of traditional venue-based approach, due to issues related to stigma and discrimination as discussed above. Regardless, our findings indicate the potential for the use of smartphone-based platforms to scale-up HIV prevention efforts among MSM in Malaysian settings.

Future Implications

While tremendous advances in HIV prevention and treatment have been achieved, these advances are still not reaching some of the most vulnerable populations. In Malaysia, the longstanding cultural and legal prohibitions of sex between men have further marginalized MSM and prevented

them from accessing HIV prevention services [e.g., HIV testing, pre-exposure prophylaxis (PrEP), HIV treatment as prevention (TasP)] due to issues related to stigma and discrimination. Our findings support the potential use of mHealth-based approaches, particularly smartphone-based apps, to promote HIV testing and deliver HIV interventions or to facilitate linkage to HIV prevention services among MSM in Malaysia. The existence of inadequate access to HIV prevention services (which are primarily facility-based), significant wait-time at existing clinics, stigma, and discrimination are more likely to dissuade MSM from seeking traditional venue-based HIV prevention services, especially if they have to discuss their sexual practices. Given the difficulties faced in targeting MSM to engage in traditional HIV prevention efforts, there may be opportunities via smartphone-based apps or via web-based approaches to facilitate HIV prevention efforts. For example, there are several smartphone app-based HIV prevention interventions in the United States aimed at improving both the HIV treatment cascade (e.g., PositiveLinks) and PrEP clinical care (e.g., Nurx) among diverse patient populations. Future research should, therefore, focus on adapting/developing similar app-based approaches and conducting feasibility and acceptability trials among MSM in Malaysian contexts.

Limitations

Several limitations of this study need to be acknowledged. First, we used a convenience sample of MSM recruited via gay social media (e.g., Grindr) rather than a representative sample of all MSM in Malaysia. The online methodology used in our study may have excluded MSM without access to the Internet on which the study was advertised. Second, the use of self-reported measures in the current study may have resulted in participants inaccurate reporting of socially undesirable behaviors (e.g., sex-related behaviors). Third, the use of cross-sectional study design limited our ability to make causal inferences.

Conclusion

Our study suggests high smartphone use by high-risk MSM to seek sexual health information. Smartphone use for seeking sexual health information is likely to increase in prevalence in the coming years among MSM in Malaysia, as it is currently common among younger age groups. These trends reinforce the potential value of engaging MSM in this setting through online smartphone-based interventions. The findings here suggest the need for further research to assess the feasibility and acceptability of smartphone-based

interventions as part of overall HIV prevention efforts to address the HIV epidemic among this high-risk, underserved group.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval The study protocol was approved by the Medical Ethics Committee of the University of Malaya, Malaysia.

Informed Consent The interviewees provided written informed consent before participating in the study.

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