

Social Predictors of HIV-testing Among Malaysian Individuals at Higher Risk of HIV Infection

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Abstract: Willingness to test for HIV is initial critical factor to break HIV transmission cycle. This study determined social predictors of willingness for HIV-testing among Malaysians at higher risk of HIV infection. A cross-sectional survey involving 369 individuals at higher risk of HIV was conducted in the Klang Valley, Malaysia. The study used a combination of snowball and respondent-driven sampling methods to approach 456 individuals yielded a response rate of 80.9%. Data were analysed using logistic regression. Almost one third (35.2%) of the respondents were willing to test for HIV. The odd ratios suggest that the odds of estimating correctly who is willing to take HIV-testing improve by 89% if one knows the subject's level of HIV-related self-stigma, by 11% if one knows the subject's level of HIV knowledge, and by 6% if one knows the subject's age. Successful intervention programs to increase HIV testing willingness among individuals at higher risk of HIV infection is contingent upon the subjects' HIV-related self-stigma, knowledge about HIV and age. The role of HIV-related self-stigma is more prominent to prevent individual at higher risk of HIV exposure from HIV testing. Further research is needed to investigate social context-specific predictors of HIV-related self-stigma.

Keywords: HIV-testing, At-risk Individuals, Health, Social Predictors, Malaysia

1. Introduction

Recent Malaysia AIDS Council Report showed that female sex workers (FSWs), injecting drug users (IDUs), men who have sex with men (MSM) and transgender individuals (TGs) account for the rise in new HIV cases in Malaysia [1]. Accordingly, the National Strategic Plan (NSP) for Ending AIDS 2016-2030 laid the foundation to control the spread of HIV among individuals at higher risk of HIV [2] through various initiatives including efforts to increase willingness to test for HIV. To this end, one of the fundamental steps is to identify predictors of willingness for HIV testing. HIV testing is 1) the only way to know somebody's HIV status, 2) a major step for HIV prevention programmes and accessing for health care services, and 3) effective in slowing the spread of the infection if the affected individuals are aware of their serological status as early as possible. Despite the importance of HIV-testing and accessibility testing services, HIV-testing among individuals at higher risk of HIV

infection remains a challenge [3].

Past studies have shown that intention for HIV testing is affected by a number of factors such as HIV knowledge, attitudes towards HIV, attitudes towards people living with HIV (PLWH), self-esteem, HIV-related stigma, and perceived social support from friends and family members. According to the theory of planned behavior (TPB) that has been extensively used in health behavioral studies [4-6], intention is a function of attitudes, subjective norms, and perceived behavioural control. Drawing from the theory's postulates relating intention with attitudes, it is assumed that individuals at-risk of HIV infection who have more negative attitudes towards HIV-testing are more likely to have lower willingness for HIV testing. Negative attitudes have been found to correlate with a number of behavioural outcomes. Savaser [8], for instance, found that negative attitudes towards HIV and PLWH may lead to behaviour such as avoiding HIV-testing, giving up hopes, committing suicide and ostracizing family members. In addition to attitude, the

theory also asserts that subjective norm is a predictor of behavioural intention. However, there are scholars who argue that perceived social support is a better predictor than subjective norm to predict behavioural intention [7]. Applied in HIV testing context, one is more likely to go for HIV-testing, if they believe that they get social support from significant others. Wang, Li, and Zheng [6] and Kagee [9] reported that individuals who found that they were infected with HIV are able to cope with the bad news knowing that the surrounding people will not isolate or discriminate them. Performing a particular behaviour also depends on how easy or difficult the performance of the behaviour is [8]. The TPB included perceived behavioural control (PBC) to account for additional variance in predicting behavioural intentions and behaviours that are not completely under individuals' volitional control [8]. PBC is usually measured by asking people how much control they have over performance of a behaviour (e.g. making a decision for HIV testing is easy or difficult for me). Ajzen [8] and Kagee [9] argued that PBC is comparable with Bandura's concept of self-efficacy. Self-efficacy and self-esteem are similar concepts [10]. Therefore, we measure social support instead of subjective norms and self-esteem instead of PBC. Three other variables including age, HIV knowledge and HIV-related self-stigma added to conceptual framework of this study formulated based on the TPB. HIV-related self-stigma acts as an obstacle to use HIV healthcare services [2], and prevent people to go for HIV testing [11-14]. According to the TPB and informed by the literature review, age and knowledge, as background factors of the TPB, do not directly affect intention but rather have an impact through beliefs and other determinants of the theory.

The proposed model was formulated to find out how much variance in the HIV-testing is explained by age, HIV knowledge, attitudes towards HIV-testing, self-esteem, HIV-related self-stigma, perceived social support from friend, family members and a special person.

2. Methods

2.1. Data

This cross-sectional survey was conducted in the Klang Valley, Malaysia. Data were gathered from 369 individuals at higher risk of HIV infection (aged 18-49 years, $M = 31.83$, $SD = 8.27$). The study used a combination of snowball and respondent-driven sampling methods to approach 456 individuals yielded a response rate of 80.9%. The first step in sampling was collaborating with NGOs working with the individuals in order to recruit initial participants known as 'seeds'. Seeds were selected based on their potential to recruit at least two other peers to participate in the study. After completing the questionnaire, the 'seeds' were given a small sum of money as incentive for the time spent on the questionnaire. They were also given coupons to encourage them to suggest two other potential participants for inclusion in the study. Each seed was limited to two coupons so that a wide group of subjects could be recruited. The 'seeds'

received an additional payment for each recruited participant who completed the questionnaire. An ethical clearance was secured from the Medical Research Ethics Committee of Faculty of Medicine and Health Science, Universiti Putra Malaysia for the survey.

A self-administered questionnaire consisted of 91 questions was employed. The original language of the questionnaire was English. It was then translated into Bahasa Malaysia (Official language in Malaysia). The translated version was verified by language experts to ensure that the Bahasa Malaysia version is equivalent to the English version and the translation was accurate. It took 15 to 20 minutes for the respondents to fill out the questionnaire.

2.2. Measures

Items to measure the variables under investigation were adopted from previous studies. Attitude towards HIV testing was measured using 20 items adopted from Muturi and An [15], Green [16] and Paruk and Mohamed [17]. Cronbach's Alpha for attitudes towards HIV-testing was .85.

Perception of social support was measured using the Multidimensional Scale of Perceived Social Support-MSPSS [18]. The scale assessed perceives availability of social support across family members, friends and a special person. Cronbach's Alpha for the perceived social support scale was .93.

Self-esteem was measured with ten items adopted Wright's validated and shortened 10-items Self-Esteem scale [19]. Self-esteem's Cronbach's Alpha was .71. To measure HIV-related self-stigma, HIV Stigma Scale was adopted [20]. Cronbach's Alpha for the HIV-related self-stigma scale was .90.

All scales were a 7-point scale, in which respondents were asked to indicate their level of agreement/disagreement to the Likert-items. The response options ranges from (1) strongly disagree to (7) strongly agree. Mean scores of these variables were computed by dividing the total scores by the number of items of the respective variables in which lower mean scores indicate unfavourable attitude, low perceived social support, low self-esteem and low self-stigma. The mean score of 4 is considered as neutral and higher mean scores suggest favourable attitude, high perceived social support, high self-esteem and high self-stigma.

HIV knowledge was assessed with 22 items adopted from Nachega, Lehman [21], Savaser [22], Maimaiti, Shamsuddin [23]. The response options were "YES" and "NO", with correct response given a score of 1 and incorrect a score of 0. The scores were added to yield a single aggregated knowledge score ranging from 0 to 22. Zero means there is no knowledge about HIV. Aggregated scores from 1 to 22 were divided into three categories: 1 to 7 consider poor, 8 to 15 indicate moderate and 16 to 22 suggest good level of HIV knowledge.

3. Results

The demographic profile of participated individuals is provided in Table 1. Almost half of the respondents (46.3%) were males, about 37% were females and the rest (16.6%)

were transgender individuals. In terms of religion, 43.8% were Muslims, 25.5% were Christians, 16.3% were Hindus and 14.4% belonged to other religions. Regarding employment status, slightly more than one-third of the respondents were employed (34.9%) and less than two-third (63.2%) were unemployed. In terms of knowing a health care facility for free HIV test, 66.4% did not know such health care facility and 33.1% knew about such facility. In relations

to be a member of any HIV/AIDS-related organization or group, a majority of the respondents (85.1%) were not a member of HIV/AIDS related organization or group. Half of the respondents knew someone infected with HIV. More than half of the respondents (57.5%) considered themselves not being at HIV risk and 42.5% reported that they are at risk of HIV infection.

Table 1. Distribution of Respondents' Profile (n = 369).

		Frequency	Percentage
Gender	Male	171	46.3
	Female	137	37.1
	Transgender	61	16.6
	Islam	162	43.8
Religion	Christian	94	25.5
	Hindu	60	16.3
	Others	53	14.4
	Yes	129	34.9
Employed Status	No	233	63.2
	No Answer	7	1.9
	No	245	66.4
Knowing a health care facility to be tested for HIV free of cost	Yes	122	33.1
	No Answer	2	00.5
	No	314	85.1
Being a member of any HIV/AIDS-related organization or group	Yes	53	14.4
	No Answer	2	00.5
	No	183	49.6
Knowing someone with HIV	Yes	182	49.3
	No Answer	4	1.1
	No	212	57.5
Being at HIV risk	Yes	157	42.5
	No	239	64.8
Willingness to test for HIV	No	239	64.8
	Yes	130	35.2

Descriptive statistics of the predictors and outcome variables are provided in Table 2. The average age of the respondents was 31.8 with a standard deviation of 8.27. The respondents had good knowledge of HIV ($M= 14.7$, $SD= 2.9$), such as HIV causes, transmission, prevention and difference between HIV and AIDS. On attitudes towards HIV testing, we found favorable attitudes ($M= 4.32$, $SD= 1.12$) suggesting that the respondent are more willingness to test for HIV. As shown in the table, almost two third (35.2%) of the respondents were willingness to test for HIV. The respondents also received

higher social supports from a "special person". A higher mean of perceived support from a "special person" ($M= 4.64$, $SD= 1.57$) compared to that of support from friends ($M= 4.60$, $SD= 1.38$) and family members ($M= 3.91$, $SD= 1.70$) suggests that perceived social supports was greater from a "special person" compared to friends and family members. As evident is the mean scores ($M= 4.09$, $SD= .94$), the respondents also had neither a high nor a low self-esteem. The results showed that the respondents had high mean scores of HIV-related self-stigma ($M= 5.23$, $SD= 1.26$).

Table 2. Mean and Standard Deviation of predictor variables (n = 369).

Variables	Min - Max	Mean	Standard Deviation
Age	18-61	31.83	8.27
HIV knowledge**	7 - 20	14.7	2.9
Attitude towards HIV-testing*	1 - 7	4.32	1.12
Perceived support from family members*	1 - 7	3.91	1.70
Perceived support from friends*	1 - 7	4.60	1.38
Perceived support from a special person*	1 - 7	4.64	1.57
Self-esteem*	2.4 - 5.9	4.09	.94
Self-stigma*	1-7	5.23	1.26

**HIV knowledge assessed with 22 items yielded an aggregated score from 0 to 22 that higher mean indicates more HIV knowledgeable.

*All variables measured on a seven-point scale that higher mean scores indicate favourable attitudes, higher perceived social support, self-esteem and self-stigma.

As a preliminary step to run logistic regression, correlation coefficients between the predictors and outcome variable was tested to see if there is any correlation between these

variables, to give some ideas which variables may or may not be included in the model, and to provide some ideas to expect the strength of model that this study comes up with. Table 3

presents the results of correlation coefficients analyses. HIV-related self-stigma was the highest correlated predictor with willingness to test for HIV ($r = -.495$, $p = .00$). The next high correlated variables were age ($r = .308$, $p = .00$), followed by social support from family members ($r = .224$, $p = .00$), knowledge about HIV ($r = .159$, $p = .00$), and attitudes towards HIV-testing ($r = .139$, $p = .02$). The higher correlation

coefficient indicates the variables are potentially better predictors of outcome variable. As shown in Table 3, social support from friends ($r = .054$, $p = .29$), self-esteem ($r = .042$, $p = .42$), and social support from a special person ($r = .005$, $p = .92$) were not significantly correlated with willingness to test for HIV.

Table 3. Correlation Coefficient of the Predictor Variables with HIV-testing among individuals at higher risk of HIV infection ($n = 369$).

Variables	HIV-testing	
	<i>r</i>	<i>P</i>
HIV-related self-stigma	-.495	.00
Age	.308	.00
Social support from Family members	.224	.00
Knowledge about HIV	.159	.00
Attitudes towards HIV-testing	.139	.02
Social support from friends	.054	.29
Self-esteem	.042	.42
Social support from Special person	.005	.92

Logistic regression was used to assess whether or not an individual at higher risk of HIV infection is willing to test for HIV. Preliminary analyses were conducted to ensure that there was no violation of the assumption for collinearity and outliers. Using “Enter” method, the eight predictor variables entered in the model in one single step.

Table 4 presents the results of logistic regression analysis. When all eight variables are considered together, they significantly predict an individual’s willingness to test for HIV, Chi square (χ^2) = 115.14, $df = 7$, $p < .001$. For the final output model, p-value, odds ratio, standard error and regression coefficients (Beta coefficient) are reported. As table 4 shows, HIV-related self-stigma, HIV knowledge and age of the respondents are significant determinants of willingness to test for HIV. This indicates HIV-related self-stigma, HIV knowledge and age are significant predictors of

willingness to test for HIV. The sign of beta coefficients for HIV-related self-stigma (-.110) showed that the variable is negatively associated with willingness to test for HIV. The positive sign of both HIV knowledge (.104) and age (.060) indicated that there is a positive relationship between these two variables with willingness to test for HIV. As table 4 presents, the odd ratios suggest that the odds of estimating correctly who is willing to take HIV-testing improve by 89% if one knows high risk individual’s HIV-related self-stigma, by 11% if one knows high risk individual’s HIV knowledge and by 6% if one knows high risk individual’s age. Attitudes towards HIV-testing, social support from family members, social support from friends, social support from a special person and self-esteem were not a significant predictor of willingness to test for HIV.

Table 4. Logistic Regression Predicting Who is Willing to Take HIV-testing.

Variable	B	SE*	Odds ratio	p
Constant	1.406	1.753	4.08	
HIV-related self-stigma	-.110	.016	.89	.000
HIV knowledge	.104	.050	1.11	.037
Age	.060	.018	1.06	.001
Attitudes towards HIV-testing	.028	.032	1.00	.337
Social support from Special person	.005	.028	1.00	.845
Social support from Family members	.031	.023	1.03	.175
Social support from friends	-.023	.030	.997	.431
Self-esteem	-.004	.017	.99	.809

Chi square (χ^2) = 115.14, $df = 7$, $p < .001$.

*Standard Error.

After excluding the non-significant variables, the final regression model predicting willingness to test for HIV is:

$$\text{Log} [P/(1-P)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e = 1.406 + .060 (\text{age}) + .104 (\text{HIV knowledge}) + -.110 (\text{HIV-related self-stigma})$$

4. Discussion and Conclusions

While the main aim of the present study sought to determine social predictors of HIV testing among individuals at higher risk of HIV infection in Malaysia cultural context,

the findings also clearly show that denial of risk of HIV among the high-risk individuals is quite prevalent. This is evident from the findings that 6 out of 10 individuals think that they are not at risk of infecting HIV. These findings are in line with Malaysia’s Integrated Biological and Behavioral Survey 2014 (24) that found understanding on prevention of

HIV through sexual transmission and rejecting major misconceptions about HIV transmission among the individuals was not satisfactory. These indicate that fulfilling Malaysia National Strategic Plan's goal to reach 90 per cent of the individuals tested for HIV by 2020 and 95 per cent by 2030 needs more efforts (2).

As it was found, only 4 out of 10 individuals at higher risk of HIV infection were willing to take HIV test. These findings are inconsistent with those of previous studies. For instance, Batona et al. [3] reported a strong intention to HIV test among a big portion of female sex workers (FSWs) in Benin. Findings of another study [25] conducted in the US reported that almost three quarter of young men who have sex with men were likely (either somewhat, very or likely) to test for HIV. As willingness to take HIV test is still a major barrier among the individuals to come forward for HIV testing, this suggests that despite of progress in achieving previous Malaysia's national strategic plans, challenges in key areas such as need for scaling up HIV testing among the individuals at higher risk of HIV infection need to be addressed (2).

Knowing social determinants of HIV testing is a key step to help increasing HIV-test rates. As evidenced, HIV-related self-stigma identified as the highest negative correlation coefficients with willingness to test for HIV. Negative and significant relationship between HIV-related self-stigma and willingness to test for HIV suggests reducing self-stigma can likely increase people's willingness to engage in HIV testing [26, 27]. Previous studies [27] reported that a project in Uganda focusing on stigma reduction and changing community norms to increase HIV testing, led to a four-fold increase in HIV testing compared to the control communities. In Malaysia where for the first time in 2014, Stigma Index was included in Integrated Biological and Behavioral Survey (IBBS) (24) among individuals at higher risk of HIV infection, it was found a high level of self-stigma among the individuals. This finding is consistent with the current study that found the respondents had high mean scores of HIV-related self-stigma. This indicates that reducing HIV-related self-stigma needs to seriously be addressed among the individuals in this country.

Age, social support from family members, HIV knowledge and attitudes towards HIV-testing were the other correlated predictor variables with willingness to test for HIV. Regarding social support from family members, Povey et al. [5] argued when social supports are available, individuals are more likely to perform an intended behavior. In this sense, perception of availability and quality of social support from family members might affect the willingness to test for HIV. Consistent with this study, Malaysia's Integrated Biological and Behavioral Survey [24] found that majority of individuals at higher risk of HIV infection did not significantly experienced stigma and discrimination in familial and community interactions. These supports the findings of a study by Maman, van Rooyen, and Groves [28] who found that people living with HIV prefer to disclose their HIV status to their family members, because they felt

that there was nothing more important than getting family support. Previous studies [29-31] have also shown the facilitating role of perceived social support from friends, family members and relevant organizations to increase HIV-testing. Although the inclusion of social support within the TPB literature is relatively new, its stronger influence than subjective norms led to suggestion that social support should be a permanent construct within the TPB, or even replace subjective norms [7]. The current study recommends the inclusion of social support to increase willingness for HIV testing and the other major health and social issues associated with the HIV epidemic.

Our findings indicate that HIV-related self-stigma, knowledge of HIV and age significantly contributed to predict willingness to test for HIV. HIV-related self-stigma that found to be a major predictor of HIV-testing was profound among the individuals. This suggests the urgent need to create self-stigma reduction programs to increase willingness to test among younger individuals at higher risk of HIV infection. Increasing knowledge about HIV is also an initial step to cope with self-stigma. As HIV knowledge was significantly associated with willingness to test for HIV and entered the final model, it implies that HIV knowledge is a major step to increase willingness to test for HIV. Positive relationship between age and willingness to test for HIV also indicates that as people getting older they are more likely to be tested for HIV. Similarly, Young et al. [27] found that older people were more likely to be tested. This finding is crucial, because a substantial number of new HIV infection (34%) in Malaysia belonged to the 13 to 29 years-old group [1].

As HIV testing considers an entry point for HIV prevention and using care services [3], increasing willingness to test for HIV among individuals at higher risk of infection in Malaysia as a crucial measure can lead to early diagnosis of HIV infection. Early detection helps to start treatment sooner, leading to better health outcomes, longer lives, and reducing the risk of spreading HIV to others. It may eventually help to break HIV transmission cycle.

To our knowledge, this is the first study conducted among individuals at higher risk of HIV infection in Malaysia using the TPB to identify social determinants of HIV testing. Previous published studies also applied the TPB among FSWs [3] or other groups [32]. These studies found a substantial variance of HIV testing explained by the theory. In Malaysia, most previous published studies focusing on HIV-related issues (e.g. 33) were not informed by any particular theories. These studies mainly either identify demographic characteristics and correlates of the uptake of HIV testing, willingness to be tested or barriers in HIV/AIDS prevention programs. Despite differences in various groups being studied, methodological and theoretical approaches, there are some similarities such as lack of willingness to be tested for HIV or no intention of getting an HIV test and low-risk perception between our findings and previous studies conducted in Malaysia (33, 24) regarding willingness for HIV testing.

Despite its important findings, this study has several limitations include self-reported measurements and cross-sectional design of the study that need to be noted. Self-reported measurements may yield to some biased responses. In spite of these limitations, there is no doubt that this cross-sectional study contributed to an understanding of the correlations of willingness to test for HIV that are required to create relevant and evidence-based interventions focusing on increasing HIV-testing rate. Furthermore, generalizability is limited and the findings may not be generalized to other individuals at higher risk of HIV infection living in the country.

In terms of practical implications, interventions to increase HIV-testing may need to take a variety of approaches. First, interventions may require focusing on reducing self-stigma surrounding HIV, promoting public awareness about benefits of HIV testing and increasing knowledge about HIV. Second, the strategies need to be implemented as early age of at-risk individuals as possible. The need to promote HIV testing among those less than 25 years highlighted in previous studies [34]. Finally, studying each subgroup of individuals at higher risk of HIV infection separately is crucial. It may assist to capture every nuance differences of at-risk individuals' willingness to test for HIV.

Competing Interests

Authors have declared that no competing interests exist.

Authors' Contributions

This work was carried out in collaboration between all authors.

Ethical approval

This study had approval of the Research Ethics Committee of Universiti Putra Malaysia (reff.:upm/fpsk/100-9/2-jkeupm (fbmk_nov (12) 21).

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