

Exploring intentions to discriminate against patients living with HIV/AIDS among future healthcare providers in Malaysia

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Abstract

OBJECTIVES Stigma towards people living with HIV/AIDS (PLWHA) is strong in Malaysia. Although stigma has been understudied, it may be a barrier to treating the approximately 81 000 Malaysian PLWHA. The current study explores correlates of intentions to discriminate against PLWHA among medical and dental students, the future healthcare providers of Malaysia.

METHODS An online, cross-sectional survey of 1296 medical and dental students was conducted in 2012 at seven Malaysian universities; 1165 (89.9%) completed the survey and were analysed. Socio-demographic characteristics, stigma-related constructs and intentions to discriminate against PLWHA were measured. Linear mixed models were conducted, controlling for clustering by university.

RESULTS The final multivariate model demonstrated that students who intended to discriminate more against PLWHA were female, less advanced in their training, and studying dentistry. They further endorsed more negative attitudes towards PLWHA, internalised greater HIV-related shame, reported more HIV-related fear and disagreed more strongly that PLWHA deserve good care. The final model accounted for 38% of the variance in discrimination intent, with 10% accounted for by socio-demographic characteristics and 28% accounted for by stigma-related constructs.

CONCLUSIONS It is critical to reduce stigma among medical and dental students to eliminate intentions to discriminate and achieve equitable care for Malaysian PLWHA. Stigma-reduction interventions should be multipronged, addressing attitudes, internalised shame, fear and perceptions of deservingness of care.

keywords discrimination, HIV/AIDS, homosexuality, Malaysia, professional healthcare students, stigma, substance abuse

Introduction

Stigma towards people living with HIV/AIDS (PLWHA) and populations affected by HIV [i.e. people who inject drugs (PWID) and men who have sex with men (MSM)] is pervasive in Malaysia (Suleiman 2012; Jin *et al.* 2014). This stigma, or social devaluation and discrediting (Goffman 1963), is structurally reinforced by discriminatory laws that restrict travel for PLWHA, criminalise same-sex activities, enforce compulsory HIV testing and treatment for PWID as well as the death penalty for drug trafficking (UNAIDS 2011). Although the role of stigma in the Malaysian HIV epidemic is understudied, recent evidence suggests that it is a key barrier to HIV testing (Wong 2013). Stigma endorsed by medical providers and mani-

festated as discrimination (i.e. poor or unfair treatment; Earnshaw & Chaudoir 2009) towards PLWHA in health-care settings may also be a barrier to treating the approximately 81 000 Malaysian PLWHA (UNAIDS 2011). Such treatment is crucial in Malaysia where tuberculosis/HIV co-infection has been on the rise, 63% of PLWHA are not on antiretroviral therapy (ART), and thousands of people die from AIDS annually (UNAIDS 2011; Suleiman 2012). Although HIV reached Malaysia later, in 2011, the HIV-related mortality in Malaysia was more than 4.5 times that (6.8% *vs.* 1.5%) of the United States (UNAIDS 2011). Multiple factors contribute to this increased mortality; however, only healthcare providers can treat HIV/AIDS and contribute to reducing health disparities among Malaysian PLWHA.

It is important to understand why Malaysian healthcare providers may discriminate against PLWHA to create and expand interventions to ameliorate discriminatory treatment. It is particularly important to understand this phenomenon now as the WHO recently released new guidelines to increase the number of PLWHA who receive treatment (WHO 2013), and therefore more PLWHA should be coming into contact with healthcare providers. The current study explores socio-demographic and stigma-related correlates of intentions to discriminate against PLWHA among Malaysian medical and dental students, the future healthcare providers of Malaysia.

Socio-demographic correlates of discrimination

Stigma, including discriminatory treatment of PLWHA, often varies by a range of socio-demographic characteristics. Malaysia is a multicultural society (Wong 2013). The state religion is Islam, and the majority of the population is Muslim with some identifying as Buddhist, Hindu or Christian. Although HIV stigma is understudied in Islamic countries (Wong 2013) there is some indication that HIV stigma may be stronger in Islamic cultures due to religious sanctions associated with illicit sexual activities and drug use (Hasnain 2005). In terms of ethnicity, the majority of the population identifies as Malay (required by law to be Muslim), with most others identifying as Chinese or Indian. Some qualitative work among the general public suggests that Malays hold more sympathetic, or less stigmatising, attitudes towards PLWHA than Chinese and Indians (Wong & Nur Syuhada 2011), whereas other quantitative work among students reveals no differences by ethnicity in attitudes towards PLWHA (Rahnama *et al.* 2011; Jin *et al.* 2014). Gender and age may also contribute to stigma. Among student samples in Malaysia, there is some evidence that men hold less stigmatising attitudes towards PLWHA (Jin *et al.* 2014) but that stigmatising attitudes towards PLWHA do not vary by age (perhaps due to the limited age range of students; Jin *et al.* 2014; Rahnama *et al.* 2011).

Clinical characteristics of students may also relate to discriminatory treatment of PLWHA. As healthcare students progress through their professional training, they may gain more knowledge about and experience with HIV, which is often related to decreased stigma (Naing *et al.* 2010) and possibly less discrimination. Students who have interacted with PLWHA via clinical training may also be less likely to endorse stigma after this interpersonal contact (Allport 1954; Jin *et al.* 2014). Finally, stigma may vary by students' area of study. There is a long, fairly universal history of both medical doctors and dentists discriminating against PLWHA (Aggleton & Par-

ker 2002; Seacat *et al.* 2009). Some evidence suggests that dental students endorse more stigma towards PLWHA than medical students in Malaysia (Jin *et al.* 2014).

Stigma-related correlates of discrimination

Beyond socio-demographic characteristics, other aspects of stigma may be associated with discrimination towards PLWHA. In addition to discrimination, stigma is manifested as prejudice and stereotypes (Earnshaw & Chaudoir 2009). Prejudice includes negative emotions and attitudes towards PLWHA, and stereotypes include group-based beliefs about PLWHA. A long tradition of social psychological research demonstrates that both the affective and cognitive aspects of stigma relate to discriminatory behaviour across a variety of devalued characteristics such as race and gender (Brewer 2007). Although these associations have been arguably understudied within the HIV epidemic (Earnshaw & Chaudoir 2009), it is possible that these same processes extend to HIV discrimination. Further, it is possible that attitudes not only towards PLWHA but also towards populations at increased risk of HIV (i.e. PWID and MSM) may shape discriminatory behaviour towards PLWHA (Herek 1999).

Among medical and dental providers acting in clinical contexts specifically, several other stigma-related constructs may be associated with discrimination towards PLWHA. Providers may feel courtesy stigma (Goffman 1963) or stigma by association from working with PLWHA. They may feel ashamed of working with PLWHA, and this shame may be associated with discriminatory treatment of PLWHA. Providers may also be afraid of contracting HIV from PLWHA. Throughout the course of the HIV epidemic, fear has been a powerful predictor of discriminatory treatment towards PLWHA in healthcare and other contexts (Aggleton & Parker 2002). Healthcare providers may also perceive that PLWHA do not deserve good care, which may lead them to provide poorer care to this population. Past work suggests that these three constructs – internalised shame, fear and perceptions of deservingness of good care – are associated with intentions to discriminate against PLWHA by healthcare providers (Stein & Li 2007).

We examined socio-demographic and stigma-related correlates of intentions to discriminate against PLWHA by Malaysian medical and dental students. We also assessed the percentage of variance accounted for by socio-demographic *vs.* stigma-related correlates to determine which suite of constructs may be more strongly related to discrimination in healthcare settings.

Methods

Procedures and participants

Data are drawn from a cross-sectional anonymous survey conducted between May and October 2012 at seven Malaysian universities where all clinical and pre-clinical training is conducted in English, comprising University of Malaya, National University of Malaysia, International Islamic University Malaysia, University Malaysia Sarawak, Penang International Dental College, Universiti Teknologi MARA Malaysia and Universiti Sains Malaysia. Administrative offices at each university emailed a link to the online survey to all undergraduate level medical and dental students pursuing a Bachelor of Medicine Bachelor of Surgery or a Bachelor of Dental Surgery degree. All students were informed that their participation was voluntary and that their answers would be kept anonymous and would not jeopardise their student status. No incentives were provided, but students were encouraged to participate because their responses may contribute to improving Malaysian healthcare and education. The online survey required <30 min to complete. The study was approved by institutional review boards at Yale University and all participating Malaysian universities.

A total of 3191 students were emailed the link to the online survey, 1296 accessed the link and 1165 (36.5%) completed the survey. As shown in Table 1, participants

were 22.4 years old on average, and the majority were female. Most identified as Malay or Chinese, and as Muslim or Buddhist. On average, participants were in their third year of study but ranged from first to sixth years. Over half of the participants were dental students, and a similar proportion had reached the clinical component of their curriculum (i.e. had experience seeing patients).

Measures

At the time of survey, no known scales measuring HIV stigma-related constructs among healthcare professionals had been psychometrically evaluated in Malaysia. The multidimensional HIV stigma scale developed by Stein and Li (2007) was chosen for the current study because (i) it was designed to measure attitudes about PLWHA as well as perceptions of appropriate medical care for and responsibilities towards PLWHA among healthcare professionals; (ii) it had been developed and evaluated in China, a socio-cultural context arguably more similar to Malaysia than others in which HIV stigma scales have been developed (e.g. Africa, North America); and (iii) it had been developed relatively recently in the course of the HIV epidemic (i.e. 2005). The scale was reviewed and judged appropriate by Malaysian representatives of the research team. Because education and training is conducted in English at all of the participating universities, the survey was administered in English.

Table 1 Socio-demographic characteristics of sample, $n = 1165$

	% (n)	Mean (SD)
Age		22.4 (1.65)
Gender		
Male	31.7 (368)	
Female	68.3 (793)	
Ethnicity		
Malay	62.1 (719)	
Chinese	29.6 (342)	
Other	8.3 (96)	
Religion		
Muslim	64.1 (744)	
Buddhist	22.1 (257)	
Other	13.8 (160)	
Year of study		3.3 (1.43)
Clinical status		
Clinical	65.8 (760)	
Pre-clinical	34.2 (395)	
Area of Study		
Dental	57.2 (658)	
Medical	42.2 (486)	
Nursing	0.6 (7)	

Percentages may not total to 100 due to missing data.

HIV discrimination intent

Intention to discriminate against PLWHA was measured using the discrimination intent at work subscale of the multidimensional HIV stigma scale (Stein & Li 2007). The scale includes four items, which participants rated on a Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Example items include the following: 'I am willing to treat HIV+ patients' and 'I am willing to provide the same care to HIV+ patients as other patients' (Cronbach's $\alpha = 0.89$).

Stigma-related constructs

Participants also completed the other subscales of the multidimensional HIV stigma scale (Stein & Li 2007). All items were rated on a Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). The prejudiced attitudes subscale consisted of four items including, 'HIV+ people who got infected through drug use deserve sympathy' (Cronbach's $\alpha = 0.43$). The

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internalised shame subscale consisted of three items including, 'If I work with HIV+ patients, I would want to change jobs' (Cronbach's $\alpha = 0.72$). The fear of AIDS subscale consisted of three items including, 'I am afraid of people living with HIV/AIDS' (Cronbach's $\alpha = 0.76$). The good care for HIV patients subscale consisted of three items including, 'People who got HIV/AIDS through commercial sex deserve good care' (Cronbach's $\alpha = 0.69$).

In addition to the multidimensional HIV stigma scale, measures were added to gauge other stigma-related constructs. Attitudes towards PLWHA as well as people representing other HIV risk groups (i.e. PWID, MSM) were measured using three feelings thermometers. Participants were asked to indicate their attitude towards PLWHA, PWID and MSM on scales ranging from *very negative* (1) to *very positive* (100). Given that greater stigma is reflected by poorer attitudes (Allport 1954; Brewer 2007), greater stigma is indicated by lower scores on the feelings thermometers. Stereotypes about PLWHA were measured using a scale used in previous work on HIV stigma (Earnshaw *et al.* 2012). The scale includes four items, 'Most people who have HIV/AIDS are... injection drug users, prostitutes, promiscuous, homosexuals'. Participants rated items on a Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5) (Cronbach's $\alpha = 0.87$).

Data analysis

First, we analysed correlations to explore bivariate associations between stigma-related constructs and discrimination intent. Second, we conducted linear mixed models to examine bivariate and multivariate associations with discrimination intent, controlling for the effect of clustering by university. Third, we conducted a sequential linear regression analysis including discrimination intent as the dependent variable. Socio-demographic characteristics (age, gender, ethnicity, religion, year of study, clinical status and area of study) were included in the first step of the analysis and stigma-related constructs (PLWHA thermometer, PWID thermometer, MSM thermometer, HIV prejudice, HIV internalised shame, HIV fear, HIV deserve good care, HIV stereotypes) included in the second step to determine the percentage of variance accounted for in discrimination intent by each group of independent variables. Analyses were conducted in SPSS version 21.

Results

Statistics describing stigma-related constructs, as well as bivariate correlations between stigma-related constructs and discrimination intent, are included in Table 2. Stigma-related constructs were correlated with both each other and discrimination intent in expected directions. The only exception was HIV stereotypes, which were

Table 2 Correlations between stigma-related constructs

	Mean (SD)	PLWHA thermometer	PWID thermometer	MSM thermometer	HIV prejudice	HIV internalised shame	HIV fear	HIV deserve good care	HIV stereotypes
PLWHA thermometer	54.09 (20.94)	–							
PWID thermometer	37.50 (24.41)	0.46**	–						
MSM thermometer	32.13 (29.33)	0.31**	0.42**	–					
HIV prejudice	3.18 (0.59)	–0.20**	–0.24**	–0.29**	–				
HIV internalised shame	2.08 (0.69)	–0.33**	–0.17**	–0.25**	0.23**	–			
HIV fear	3.00 (0.85)	–0.35**	–0.17**	–0.15**	0.24**	0.47**	–		
HIV deserve good care	3.72 (0.71)	0.22**	0.16**	0.15**	–0.36**	–0.26**	–0.18**	–	
HIV stereotypes	3.19 (0.81)	–0.05	–0.02	–0.11**	0.14**	0.10**	0.14**	0.03	
HIV discrimination intent	2.14 (0.71)	–0.38**	–0.19**	–0.16**	0.15**	0.43**	0.41**	–0.38**	–0.02

PWID, people who inject drugs; MSM, men who have sex with men.

** $P \leq 0.001$.

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negatively correlated only with the MSM thermometer and positively correlated with HIV prejudice, HIV internalised shame and HIV fear. Unexpectedly, HIV stereotypes were uncorrelated with the PLWHA and PWID thermometers, perceptions that PLWHA deserve good care, and discrimination intent.

The mean score for discrimination intent was 2.14 (SD = 0.71), indicating that students on average ‘disagreed’ that they would discriminate against PLWHA. Scores ranged from 1 to 5, revealing that at least some students ‘agreed’ or ‘strongly agreed’ that they would discriminate against PLWHA. The intraclass correlation between universities for HIV discrimination intent was 0.10, demonstrating some variation by university in HIV discrimination intent.

Results of the bivariate linear mixed model analyses are shown in Table 3. Of the socio-demographic characteristics, gender and area of study were associated with discrimination intent. Both female and dental students reported greater discrimination intent. Age, ethnicity, religion, year of study and clinical status were unrelated to discrimination intent. Of the stigma-related constructs, the PLWHA thermometer, PWID thermometer, MSM thermometer, HIV prejudice, HIV internalised shame, HIV fear and HIV-infected patients deserve good care were all associated with discrimination intent. Students

who endorsed more negative feelings towards PLWHA, PWIDs and MSM intended to discriminate more against PLWHA. Students who endorsed more prejudice towards PLWHA, who internalised greater HIV shame, and who held more fear of HIV reported greater discrimination intent. Students who disagreed that PLWHA deserve good care also reported greater discrimination intent. Endorsement of HIV stereotypes was unrelated to discrimination intent.

Associations between socio-demographic characteristics and stigma-related constructs with intention to discriminate against PLWHA changed slightly in the final multivariate analysis (Table 3). Of the socio-demographic characteristics, year of study became associated with increased discrimination intent such that students in earlier years reported greater discrimination intent. All other associations remained unchanged. Of the stigma-related constructs, the PLWHA thermometer remained associated with discrimination intent, whereas the PWID and MSM thermometers became unassociated. HIV internalised shame, HIV fear and HIV patients deserve good care remained associated with discrimination intent. HIV stereotypes remained unassociated with discrimination intent. Unexpectedly, HIV prejudice became negatively associated with discrimination intent within this multivariate analysis. We therefore eliminated HIV prejudice from

Table 3 Regressions with HIV discrimination intent as dependent variable

	Bivariate regressions			Multivariate regression		
	<i>B</i>	SE	<i>t</i>	<i>B</i>	SE	<i>t</i>
Socio-demographic characteristics						
Age	−0.01	0.01	−0.33	0.02	0.02	1.03
Male	−0.16	0.04	−3.59**	−0.12	0.04	−2.99*
Malay	0.06	0.05	1.17	0.19	0.13	1.49
Chinese	−0.02	0.05	−0.38	0.06	0.09	0.65
Muslim	0.04	0.06	0.75	−0.10	0.14	−0.74
Buddhist	0.01	0.06	0.19	−0.04	0.08	−0.49
Year of study	−0.02	0.16	−1.26	−0.06	0.03	−2.36†
Clinical status	0.01	0.05	0.24	0.08	0.07	1.23
Dental student	0.47	0.06	7.52**	0.21	0.05	4.17**
Stigma-related constructs						
PLWHA thermometer	−0.01	0.01	−13.07**	−0.01	0.00	−5.12**
PWID thermometer	−0.01	0.00	−6.00**	−0.00	0.00	−0.87
MSM thermometer	−0.01	0.00	−4.54**	0.00	0.00	1.47
HIV prejudice	0.18	0.03	5.06**	−0.07	0.04	−2.10†
HIV internalised shame	0.43	0.03	15.40**	0.23	0.03	7.28**
HIV fear	0.33	0.02	14.48**	0.18	0.03	6.99**
HIV deserve good care	−0.35	0.03	−13.05**	−0.24	0.03	−8.63**
HIV stereotypes	−0.01	0.03	−0.23	−0.02	0.02	−1.04

PWID, people who inject drugs; and MSM, men who have sex with men.

† $P \leq 0.05$; * $P \leq 0.01$; ** $P \leq 0.001$.

our analysis to determine the percentage of variance accounted for by the variables in discrimination intent.

As shown in Table 4, the variables included in the model accounted for 38% of the variance in HIV discrimination intent. Socio-demographic characteristics as a group (including age, gender, ethnicity, religion, year of study, clinical status and area of study) accounted for 10%, whereas stigma-related constructs as a group (including PLWHA thermometer, PWID thermometer, MSM thermometer, HIV internalised shame, HIV fear, HIV deserve good care, HIV stereotypes) accounted for 28% of the variance.

Discussion

The current study explored socio-demographic and stigma-related correlates of intentions to discriminate against patients with HIV/AIDS among 1165 Malaysian medical and dental students – the future healthcare providers in Malaysia, a middle-income country with an HIV epidemic predominantly among PWIDs, but with evidence of an emerging epidemic among MSM. Findings demonstrate that stigma-related constructs play a larger role in HIV discrimination intent than socio-demographics. Students who reported poorer attitudes towards PLWHA, greater shame regarding treating PLWHA, greater fear of HIV and greater disagreement that PLWHA deserve good care held greater intentions to discriminate against PLWHA. Socio-demographic characteristics played a significant but relatively smaller role in HIV discrimination intent. Results demonstrated that female students, students in a less advanced year of study and dental students held greater intentions to discriminate against PLWHA.

This study contributes to a small but increasing body of research on HIV stigma in Malaysia specifically and to research on the growing HIV epidemic in Asia more broadly. By seeking to better understand intentions of medical and dental students to discriminate against PLWHA, it extends this research into centres of higher

education and healthcare settings. We included data from a remarkably large sample of healthcare students from seven Malaysian universities, representing a diversity of ethnicities, religions, stages of professional education and areas of study. Further, the study differentiates between a suite of stigma-related constructs to better understand which are associated with intentions to discriminate against PLWHA. Such nuanced measurement of stigma is critical to pinpoint specific areas of intervention to ultimately reduce discrimination in healthcare settings.

Several limitations should be considered, however, when interpreting and applying our results. Although we used a validated subscale to measure HIV prejudice (Stein & Li 2007), results revealed potential weaknesses with this subscale. The subscale demonstrated poor reliability in the current sample. It demonstrated the expected association with HIV discrimination intent in the bivariate analysis: a positive relationship such that greater prejudice was associated with greater discrimination intent. In the multivariate analysis, however, it switched to an unexpected association: a negative relationship suggesting that greater prejudice was associated with less discrimination intent. Taken together, our results suggest that the HIV prejudice subscale of the multidimensional HIV stigma scale was unreliable and therefore potentially not useful within our sample. Relatedly, HIV stereotypes were unrelated to HIV discrimination intent in the current study. This may be because HIV discrimination intent is less driven by cognitive (i.e. stereotypes) than affective (i.e. attitudes, fear) aspects of stigma among Malaysian medical and dental students. These non-significant findings could also be because our measure of HIV stereotypes may not adequately represent HIV stereotypes in Malaysia. To date, this specific measure has been used in research on HIV stereotypes in the United States (Earnshaw *et al.* 2012), but not in Malaysia or elsewhere in Asia, where cultural differences exist. Our study focused on explicit stigma (i.e. conscious and intentional), but stigma can also be implicit (i.e. unconscious and

Table 4 Percentage of variance accounted for in HIV discrimination intent by socio-demographic characteristics and stigma-related constructs

	R	R ²	R ² change	F change
Step 1: socio-demographic characteristics	0.33	0.10	0.10	12.95**
Step 2: stigma-related constructs	0.62	0.38	0.28	63.84**

Socio-demographic characteristics include age, gender, ethnicity, religion, year of study, clinical status and area of study; stigma-related constructs include PLWHA thermometer, PWID thermometer, MSM thermometer, HIV internalised shame, HIV fear, HIV deserve good care, HIV stereotypes.

** $P \leq 0.001$.

unintentional), and research demonstrates that implicit stigma is associated with discrimination in healthcare settings (for a review, see Dovidio *et al.* 2008). It is critical for future research to examine the psychometric properties of and validate both explicit and implicit HIV stigma measures in Malaysia and other Asian contexts and develop new measures when needed, in order for HIV stigma research in Malaysia specifically and Asia more generally to continue to progress.

We examined medical and dental students' intentions to discriminate against PLWHA. It is possible that actual discrimination may be different than intentions to discriminate. There is both theoretical rationale and empirical evidence, however, suggesting that behavioural intentions are appropriate proxies for actual behaviour. The Theory of Reasoned Action (Fishbein & Ajzen 1975) and the Theory of Planned Behaviour (Ajzen 1991), for example, both suggest that behavioural intentions map onto actual behaviour. Empirical evidence supports these claims by demonstrating that behavioural intentions relate to subsequent actual behaviour (Ajzen & Fishbein 1973; Schifter & Ajzen 1985; Hagger & Chatzisarantis 2009). We explored HIV discrimination intent among a sample of students rather than actual healthcare providers. Although these students are the future Malaysian healthcare providers and therefore important to study to understand stigma within healthcare contexts in the coming years, the extent to which their results generalise to actual providers is unknown. Future research should examine the extent to which these correlates relate to actual discrimination among medical and dental healthcare providers.

As understandings of HIV stigma in Malaysian healthcare settings continue to grow, future research may also explore experiences of HIV discrimination from the perspectives of PLWHA. PLWHA may perceive discrimination from providers who are not aware that they are discriminating against patients, or who would not explicitly admit to discriminating or intending to discriminate against them. Indeed, there is a rich literature on experiences of discrimination in healthcare settings from the perspective of PLWHA in other areas of the world (e.g. Giuliani *et al.* 2005; Rungsiyanont *et al.* 2012). These perceptions of discrimination may have a direct impact on care: PLWHA who perceive discrimination may be less likely to access care, accept that antiretroviral medications are safe and effective, adhere to their medication, and trust their physicians (Earnshaw *et al.* 2013). Therefore, it is important to study both healthcare providers and patients to fully understand discrimination towards PLWHA in Malaysian healthcare settings.

Conclusions

The results of the current work suggest that interventions to reduce intentions to discriminate against PLWHA among future healthcare providers in Malaysia should focus on changing the extent to which stigma-related constructs, particularly those that are affective in nature, are endorsed by medical and dental students. Such constructs appear to play an important role in intentions to discriminate. Stigma-reduction interventions should be multipronged, addressing attitudes, internalised shame, fear and perceptions of deservingness of care. Such interventions could be adapted from existing stigma-reduction interventions (e.g. those designed to enhance cross-cultural education and strengthen cross-cultural communication) and integrated into medical and dental training, which represents an ideal setting for reducing bias among future healthcare providers (Smedley *et al.* 2003). Theory-based interventions that incorporate information, skills building and personal contact with PLWHA show promise for reducing HIV stigma (Bos *et al.* 2008). Such interventions should be a collaboration between health promoters, key decision makers (e.g. university administration) and communities with or at risk of HIV (e.g. PLWHA, PWID, MSM) (Bos *et al.* 2008). The finding that less advanced students had higher intentions to discriminate also suggests that such interventions should be introduced early in the curriculum. It is critical to reduce stigma and eliminate intentions to discriminate against PLWHA among medical and dental students to achieve equitable care for Malaysian PLWHA.

Acknowledgements

Funding for this research was provided by the Wilbur G. Downs International Health Student Travel Fellowship [HJ], the National Institutes on Drug Abuse [R01 DA025943 for FLA and JAW; K24 DA017072 for FLA], the National Institute of Mental Health [T32 MH020031 for VAE; P30 MH062294 for FLA, VA, and JAW], and the Ministry of Higher Education High Impact Research Grant [UM.C/625/1/HIR/01/H-20001-00-E00001 for AK; UM.C/HIR/MOHE/DENT/07 for JJ].

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