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# Role of ethical beliefs and attitudes of dental students in providing care for HIV/AIDS patients



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## KEYWORDS

HIV/AIDS;  
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**Abstract** *Introduction:* Dental care has remained as an unmet need for people living with HIV/AIDS (PLWHAs). Dental students are considered as future healthcare workforce and having beliefs which are discriminating may have negative attitudes towards providing care to these individuals (Azodo et al., 2010). The study aimed to assess the ethical beliefs and attitudes of dental students towards PLWHAs for providing care.

*Methods:* It is a descriptive correlational and cross sectional study. Nine public and private dental schools in Malaysia participated in the study. Data was collected using a validated self-administered questionnaire.

*Results:* A total of 481 dental students participated in this study, yielding response rate of 78%. Majority of the participants (74%) believed that patients' HIV status should be disclosed to patients' sexual partner without permission. Approximately 60% of the participants reported that rooms/beds of HIV patients should be clearly marked. Regarding patient disease status 28% of the students reported that it is appropriate to test a patient for HIV/AIDS without patient's permission. Only Fifty five percent of the students expressed the willingness to treat HIV patients and 49% reported to held fear of getting infected while treating patients with HIV/AIDS. Sixty four percent of the participants reported to be more comfortable giving care to non-HIV patients than HIV-positive patients.

*Conclusion:* Dental students' ethical beliefs about HIV/AIDS were not consistent with the ethical principles as stated in the code of ethics and they held negative attitudes towards PLWHAs. Ethical beliefs were found to be a determinant that may influence future attitudes of these students towards individuals with HIV/AIDS when providing care.

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## 1. Introduction

Human immunodeficiency virus (HIV) infection and its subsequent progression to acquired immune deficiency syndrome (AIDS) is a devastating public health problem with high morbidity and mortality rates (Grover et al., 2014; WHO, 2014). By the end of 2010 the number of people living with HIV worldwide was estimated to be 34 million (UNAIDS, 2012).

Within Asia, Malaysia is reported to have a high incidence of disease transmission and individuals living with AIDS. In Malaysia, the first 3 cases of HIV were diagnosed in 1986. The number of HIV cases had increased from 4 cases in the year of 1990 to a cumulative figure of 94841 cases in 2011 (MOH, 2014). The provision of oral healthcare is important for people living with HIV/AIDS (PLWHAs) as oral manifestations of the disease can be debilitating and may affect the quality of life of the patients. Early detection and management of the oral manifestations can prevent further exacerbation of the disease with subsequent improvement of the patients' quality of life (Hodgson et al., 2006). However, dental care has remained an unmet need for PLWHAs as they experience greater barriers accessing oral healthcare (Jones et al., 2012). Stigma and discrimination towards PLWHAs contribute to undermining the healthcare efforts to control the disease and prevent its transmission (Relf et al., 2009), Individuals' behaviours and reactions are determined by their beliefs and attitudes that are acquired during their life experiences (Röndahl et al., 2003). According to Fishbein and Ajzen, beliefs are formed from direct experiences, interactions with others and on the basis of information provided from an external source (Fishbein and Ajzen, 1975). Ethical beliefs refers to the belief system of ethical principles and standard applications on provision of healthcare where other beliefs refer to the beliefs regarding the advantages and disadvantages associated with the external norms (Black, 2007; Beauchamp and Childress, 2001). Belief about the likely outcome of an event, either good or bad, provides the basis for the formation of attitude towards that particular event (Röndahl et al., 2003). Negative attitudes towards PLWHAs are common and are implicitly associated with stigmatization or immoral behaviours (Parker et al., 2002). When the negative attitude exists within healthcare professionals towards PLWHAs, there is a high risk that they may discriminate or treat them differently (Maio and Augoustinos, 2005; Brehm et al., 2002; Sadeghi and Hakimi, 2009; Williams, 2007; BPS, 2006).

Ethical codes and conducts in dentistry comprise of principles which strengthens the professional practice in providing dental treatment (Williams, 2007). Ethical principle reflects the fundamental beliefs that govern the decision making and behaviour (BPS, 2006). Dental professionals are obliged to practice in accordance with the fundamental principles that support the code of ethics (Darby and Walsh, 2014). Dental students are an integral part of the future healthcare workforce, having beliefs which are discriminating in providing care to PLWHAs may result in unethical professional conduct and clinical practices. The aim of the study is to determine whether the dental students' ethical beliefs affect their attitudes towards providing care for PLWHAs.

## 2. Methods

The study was conducted in nine dental schools in Malaysia. All dental schools were initially approached by e-mail, explaining the purpose of the study. Out of twelve public and private dental schools- one dental school was excluded; because it was a new dental school and it did not meet the inclusion criteria of having students in clinical year's. All clinical year students (4th and 5th year) were included in the study. Out of the 11 dental schools approached 9 of them agreed to participate in the

study. Stratified random sampling was used for selection of study population. The stratification was based whether University was stated funded or privately run and its locations. Five public universities<sup>1</sup> were located in Selangor, Kuala Lumpur and Kelantan, while four private universities<sup>2</sup> were located in Selangor, Kuala Lumpur and Kedah. The questionnaire was distributed by hand to the dental schools located in Kuala Lumpur and Selangor regions, while posted to the schools located outside these regions. Informed consent was obtained from the participants prior to the administration of the questionnaire.

A validated self-administered questionnaire in English – which is the medium of instruction – was distributed to clinical year dental students (fourth and fifth year). The questionnaire was modified from the UNAIDS model questionnaire for attitudes, beliefs and practices survey about HIV/AIDS (Relf et al., 2009). Minor modifications were made by four content experts (academic staff) by the Dental University funding the research. The questionnaire was piloted on 20 students to validate content and determine clarity and applicability to local context. No modifications were made to the questionnaire following the pilot test. The study received ethical approval (B01-09-Res 052012) from the Medical University Joint Research and Ethics Committee.

The questionnaire comprised of three sections; the first section addressed the demographics and the learning experience of the students in relation to HIV/AIDS topics. The learning experience was determined through 8 dichotomous (yes/no) items; the second section assessed the ethical beliefs of the students towards providing care to PLWHAs through 31 likert-scale items. The ethical beliefs section included the belief towards testing for HIV/AIDS, confidentiality, policies in healthcare setup and beliefs towards the disease and its transmission. The final part of the questionnaire assessed the students' attitudes towards providing care to PLWHAs. The instrument used showed the reliability of the questionnaire with a Cronbach alpha value of 0.7.

Data were analyzed using SPSS v20 (SPSS Inc. Chicago, Illinois, USA), Descriptive statistics were calculated for all data. Data obtained from the attitudes section were binned into a new variable represented by the total score of the attitudes and divided the students' attitudes into negative and positive attitudes. Spearman's correlation test was used to look for correlations between the total score of attitudes and the ethical beliefs of the students.

## 3. Results

Of the total 616 students in their fourth and fifth years of the dental program, 481 responded (overall response-rate of 78%). Demographic characteristics of the participants were as following; males 134 (28%), females 347 (72%). Public Universities 373 (77%), Private 108 (23%). Three main ethnic groups; Malay 294 (61%), Chinese 149 (31%), Indian 24 (5%) and other 14 (3%). Two hundred fifteen (45%) dental students were enrolled in fourth year of education while 266 (55%) were in fifth year of dental education.

Regarding the learning experiences of the students in relation to HIV/AIDS topics, 72% of the participants reported that the HIV/AIDS topic was covered as part of their dental schools curricula while only 18% reported that they had received HIV/AIDS case studies.

<sup>1</sup> Public: UKM, USM, UiTM, USIM, IUM.

<sup>2</sup> Private: IMU, AIMST, MAHSA, Melaka Manipal.

Sixty percent of the students agreed that they were not trained effectively to treat individuals with HIV/AIDS and 3% of them had ever provided care for PLWHAs. Results obtained under the learning experience section of the questionnaire are presented in [Table 1](#).

### 3.1. Dental students' attitudes towards PLWHAs

Provision of care for individuals with HIV/AIDS was addressed using 9 items presented in [Table 3](#). Out of 481 dental students; 259 (54%) showed tendency of having negative attitudes towards HIV/AIDS patients while 222 (46%) exhibited more positive attitudes. Eight percent reported that they will refuse to treat HIV/AIDS patient and forty five percent of the students were willing to treat those patients, while 38% of the students were not sure about providing treatment. Twelve percent of the students reported that they may avoid providing care for PLWHAs while 37% were not sure about their future attitude towards avoiding to provide care. Forty nine percent of the students has fear of becoming infected while and 31% were uncertain about their fears. Sixty four percent of the participants reported being more comfortable

giving care to non-HIV patients than HIV-positive patients while 23% of them felt uncomfortable around people who are infected with HIV/AIDS. However, only 10% would feel uncomfortable when providing care for HIV-infected family members. Nineteen percent of the participants were concerned about being stigmatized by family if they have to provide care for HIV/AIDS patients ([Table 2](#)).

### 3.2. Dental students beliefs towards PLWHAs

Findings of ethical principles addressing HIV testing, confidentiality, and environmental care towards PLWHAs presented in [Table 3](#). Fifty five percent of the participants agreed that routine HIV testing must be conducted for all patients upon admission. Twenty eight percent of the participants believed that it is appropriate to test a patient for HIV even without patient's permission. The ethical beliefs about routine HIV testing as well as the testing of HIV without permission were found to be positive but weakly correlated with attitudes ( $r = 0.14$ ,  $p = 0.002$ ;  $r = 0.11$ ,  $p = 0.012$ ).

Ethical beliefs regarding patients' confidentiality demonstrated that 74% of the participants believed that sexual partners of HIV-infected patients should be notified about patients' HIV status even without taking patient's consent. Forty three percent of the participants believed that relatives should be notified of patients' HIV status. The beliefs about disclosing patients' HIV status to sexual partners and relatives were found to be positively but weakly correlated with attitudes ( $r = 0.15$ ,  $p = 0.001$ ;  $r = 0.23$ ,  $p < 0.01$ ).

In relation to the environmental care, majority of the participants believed that rooms/beds (60%) and charts (78%) of HIV patients should be clearly marked. There were positive correlations between both the aforementioned items with attitudes ( $r = 0.17$ ,  $p < 0.001$ ;  $r = 0.08$ ,  $p = 0.10$ ).

[Table 4](#) represents ethical beliefs towards policies in healthcare setup which may affect the level care provided for HIV/AIDS patients. Ninety percent of the participants felt that healthcare professionals should be informed if a patient is HIV-positive. Only twenty one percent of dental students agreed that HIV-infected healthcare professionals should be allowed to work in area which requires direct patient contact.

Dental students (37%) believed that individuals with HIV/AIDS received lesser quality of care and 36% reported that PLWHAs were treated like outcasts. Fifty four percent of the participants agreed that HIV/AIDS individuals were stigmatized while 47% of them believed that HIV/AIDS patients should be admitted in separate wards. Only

**Table 1** Educational learning experiences related to HIV/AIDS topic.

Items	Participants who responded 'yes' (N = 481)
	N (%)
Covered HIV/AIDS as a topic in dental program	348 (72)
Browsed internet sources about HIV/AIDS	310 (64)
Read books in my own time about HIV/AIDS	219 (45)
Effectively trained to provide care to a person with HIV/AIDS	194 (40)
Reviewed HIV/AIDS case studies	86 (18)
Attended conferences on HIV/AIDS	70 (15)
Participated in activities/events related to HIV/AIDS topic	44 (9)
Provided care for someone with HIV/AIDS	15 (3)

**Table 2** Attitudes towards Individuals with HIV/AIDS (N = 481).

Items	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
Not effectively trained to counsel a patient with HIV/AIDS	70 (14.6)	241 (50.1)	141 (29.3)	25 (5.2)	4 (0.8)
Concerned about being stigmatized by my family if had to provide care for HIV/AIDS patients	6 (1.2)	86 (17.9)	210 (43.7)	148 (30.8)	31 (6.4)
Concerned about being stigmatized by friends if had to provide care for HIV/AIDS patients	8 (1.7)	78 (16.2)	203 (42.1)	160 (33.3)	32 (6.7)
More comfortable giving care to non HIV patients than to HIV-positive/AIDS patients	71 (14.8)	233 (48.4)	136 (28.2)	33 (6.9)	8 (1.7)
Refuse to treat HIV-infected patients to protect myself and family	8 (1.7)	30 (6.2)	181 (37.6)	210 (43.7)	52 (10.8)
May try to avoid caring for HIV/AIDS patients	7 (1.5)	52 (10.8)	178 (37.0)	204 (42.4)	40 (8.3)
Feel uncomfortable around people who are infected with HIV/AIDS	9 (1.9)	103 (21.4)	215 (44.6)	121 (25.2)	33 (6.9)
Feel uncomfortable to provide care for a family member sick with HIV/AIDS	6 (1.2)	42 (8.7)	181 (37.7)	205 (42.6)	47 (9.8)
Fear of becoming infected with HIV infections	43 (8.9)	192 (39.9)	149 (31.0)	77 (16.0)	20 (4.2)

**Table 3** Ethical beliefs related to HIV/AIDS and its correlation with attitudes ( $N = 481$ ).

Items	Strongly agree $N$ (%)	Agree $N$ (%)	Neutral $N$ (%)	Disagree $N$ (%)	Strongly disagree $N$ (%)	$P$ value (correlation coefficient)
Ethical beliefs about HIV testing						
Appropriate to test a patient for HIV/AIDS without the patient's permission	21 (4.4)	115 (23.9)	113 (23.4)	147 (30.6)	85 (17.7)	0.002 (0.14)
All healthcare workers should be routinely tested for HIV/AIDS	188 (39.1)	215 (44.7)	66 (13.7)	11 (2.3)	1 (0.2)	0.290 (0.05)
HIV/AIDS testing should be routinely performed as part of the admission process	71 (14.8)	193 (40.1)	149 (31.0)	55 (11.4)	13 (2.7)	0.010 (0.11)
Ethical beliefs about confidentiality/disclosure						
Notification to patients' relatives even without patient's permission	65 (13.5)	143 (29.7)	109 (22.7)	128 (26.6)	36 (7.5)	0.001 (0.23)
Notification to patients' sexual partner even without patients' permission	138 (28.7)	219 (45.5)	67 (13.9)	46 (9.6)	11 (2.3)	0.001 (0.15)
Health care personnel have the responsibility to inform a spouse/partner or boyfriend/girlfriend of the patient's HIV status	107 (22.2)	255 (53.0)	91 (19.0)	24 (5.0)	4 (0.8)	0.020 (0.10)
Ethical beliefs about HIV-related environmental care						
Rooms/beds of HIV/AIDS patients should be clearly marked	85 (17.7)	203 (42.2)	102 (21.2)	82 (17.0)	9 (1.9)	0.001 (0.17)
Charts of patients with HIV/AIDS should be clearly marked	113 (23.5)	263 (54.7)	65 (13.5)	36 (7.5)	4 (0.8)	0.100 (0.08)

**Table 4** Beliefs towards policies in healthcare setup and its correlation with attitudes ( $N = 481$ ).

Items	Strongly disagree $N$ (%)	Disagree $N$ (%)	Neutral $N$ (%)	Agree $N$ (%)	Strongly agree $N$ (%)	$P$ value (correlation coefficient)
Healthcare professionals should be told when a patient has HIV/AIDS	2 (0.4)	7 (1.5)	41 (8.5)	218 (45.3)	213 (44.3)	0.006 (-0.124)
Healthcare professionals with HIV/AIDS should be allowed to work in area that requires direct patient contact	103 (21.4)	134 (27.9)	142 (29.5)	91 (18.9)	11 (2.3)	0.011 (-0.116)
HIV infected healthcare professionals should be allowed to perform invasive procedures such as drawing blood or giving an injection	152 (31.6)	166 (34.5)	101 (21.0)	49 (10.2)	13 (2.7)	0.101 (-0.075)

7% of the participants believed that individuals with HIV/AIDS patients behaved immorally. There were positive correlations between these items and attitudes (Table 5).

Beliefs regarding HIV transmission showed that 10% of the students reported that HIV infection could be transmitted through mosquitoes or sharing food/drink. Sixty percent of the participants believed that condoms are effective in preventing HIV transmission while 78% of them were aware that a pregnant woman with HIV/AIDS can transmit HIV to her unborn child (Table 6).

#### 4. Discussion

The purpose of this study was to investigate frequency of positive or negative ethical beliefs and attitudes of dental students towards PLWHAs and its possible association. Students in their final years of the dental programs were chosen for this study because they are considered an integral part of the dental workforce. Providing care for PLWHAs by dental students requires the student to obtain a group of competencies. Professionalism, infection control, patient right and confidentiality are identified as a major competency for graduating dental

students where the graduate should display appropriate caring behaviour towards patients and be competent to provide humane and compassionate care (Cowpe et al., 2010).

Academic learning experiences in relation to HIV/AIDS were addressed in this study through eight items. Teaching and learning methods commonly used for HIV/AIDS topics were didactic lectures, seminars, online resources and textbooks. Majority of the students covered topics related to HIV/AIDS as part of their curricula and reported that they have surfed the Internet to obtain HIV/AIDS-related information, whereas the use of textbooks to obtain information was reported the least (Selwyn, 2008).

The internet sources of information used by the students cannot be validated and can be library-based or internet-based hence the quality of the information obtained cannot be trusted (Burton and Chadwick, 2000). The utilization of various web-based resources can be a reason for some misconceptions and wrong information obtained by the students in relation to the disease (Burton and Chadwick, 2000; Bauermeister et al., 2012). Utilization of HIV/AIDS related case studies as a teaching methodology in the dental schools

**Table 5** Beliefs towards individuals with HIV/AIDS and its correlation with attitudes ( $N = 481$ ).

Items	Strongly agree $N$ (%)	Agree $N$ (%)	Neutral $N$ (%)	Disagree $N$ (%)	Strongly disagree $N$ (%)	$P$ value (correlation coefficient)
Individuals with HIV/AIDS behave immorally and deserve to have the disease	4 (0.8)	28 (5.8)	146 (30.4)	204 (42.4)	99 (20.6)	0.001 (0.24)
HIV/AIDS patients should be on a separate ward	34 (7.1)	191 (39.7)	152 (31.5)	95 (19.8)	9 (1.9)	0.001 (0.28)
HIV/AIDS status can be determined by physical appearance	3 (0.6)	103 (21.4)	114 (23.7)	210 (43.7)	51 (10.6)	0.010 (0.11)
A healthy looking person can be infected with HIV/AIDS	5 (1.0)	16 (3.3)	34 (7.1)	330 (68.6)	96 (20.0)	0.250 (-0.06)
Treating someone with HIV/AIDS is a waste of resources	0 (0.0)	8 (1.7)	65 (13.4)	285 (59.3)	123 (25.6)	0.001 (0.23)
Individuals with HIV/AIDS are treated like outcasts	16 (3.3)	156 (32.4)	206 (42.9)	86 (17.9)	17 (3.5)	0.030 (0.10)
Individuals with HIV/AIDS are stigmatized in my community	37 (7.7)	223 (46.4)	165 (34.2)	46 (9.6)	10 (2.1)	0.180 (0.06)
HIV/AIDS patients receive lesser quality of healthcare	15 (3.1)	164 (34.1)	180 (37.4)	108 (22.5)	14 (2.9)	0.010 (0.12)
The quality of life of HIV/AIDS patients can be improved with counselling	65 (13.5)	317 (65.9)	79 (16.5)	16 (3.3)	4 (0.8)	0.450 (0.04)
Medications to treat opportunistic infections may prolong the life of a patient with HIV/AIDS	76 (15.8)	332 (69.0)	62 (12.9)	8 (1.7)	3 (0.6)	0.920 (-0.004)

**Table 6** Beliefs towards HIV/AIDS as a disease and transmission and its correlation with attitudes ( $N = 481$ ).

Items	Strongly agree $N$ (%)	Agree $N$ (%)	Neutral $N$ (%)	Disagree $N$ (%)	Strongly disagree $N$ (%)	$P$ value (correlation coefficient)
HIV/AIDS is a man-made disease	38 (7.9)	158 (32.8)	169 (35.2)	82 (17.0)	34 (7.1)	0.001 (0.19)
A person can get HIV/AIDS through witchcraft	2 (0.4)	37 (7.7)	159 (33.1)	125 (26.0)	158 (32.8)	0.120 (0.07)
Condom use can prevent getting HIV/AIDS	43 (8.9)	249 (51.8)	115 (23.9)	60 (12.5)	14 (2.9)	0.460 (0.03)
Can prevent HIV/AIDS by being faithful to one sexual partner	82 (17.0)	239 (49.7)	96 (20.0)	54 (11.2)	10 (2.1)	0.050 (-0.09)
Abstinence is the only way to prevent getting HIV/AIDS	16 (3.3)	70 (14.6)	200 (41.6)	155 (32.2)	40 (8.3)	0.070 (0.08)
Mosquito can transmit HIV/AIDS	4 (0.8)	43 (8.9)	84 (17.5)	188 (39.1)	162 (33.7)	0.004 (0.13)
A woman with HIV/AIDS can become HIV-negative by giving birth to a HIV-positive baby	8 (1.7)	40 (8.3)	101 (21.0)	168 (34.9)	164 (34.1)	0.030 (0.10)
A pregnant woman with HIV/AIDS can transmit HIV to her unborn child	93 (19.3)	284 (59.0)	60 (12.6)	26 (5.4)	18 (3.7)	0.790 (-0.01)
Contract HIV by sharing food or drink with a person who has HIV/AIDS	7 (1.5)	44 (9.1)	77 (16.1)	221 (45.9)	132 (27.4)	0.001 (0.15)
A person can test HIV negative, but still be infected with HIV	54 (11.2)	226 (47.0)	139 (28.9)	45 (9.4)	17 (3.5)	0.040 (-0.04)

was reported by a small group of the students. This finding clearly indicates that HIV/AIDS clinical teaching is not a strong part of the dental curricula. Attendance of scientific conferences, participation in activities related to HIV/AIDS and caring for PLWHAs was reported by less than 20% of the students. Similar findings were reported by a study conducted in Iran to assess the knowledge of the dental students and their attitudes towards HIV/AIDS (Sadeghi and Hakimi, 2009).

Ethical beliefs refers to the beliefs of ethical principles that include autonomy, beneficence/non-maleficence and justice (Black, 2007; Beauchamp and Childress, 2001). It was impor-

tant to identify the ethical beliefs of the students in relation to HIV/AIDS and PLWHAs in an attempt to explain their attitudes and their future dealing with this group of vulnerable population. The first part of the ethical beliefs questionnaire addressed the students' beliefs towards HIV/AIDS testing, confidentiality/disclosure and environment of care provided for PLWHAs. Testing for HIV is essential to facilitate early diagnosis and management of the condition in order to prolong lifespan of the patient and to prevent the transmission of the disease. However, the stigma associated with HIV/AIDS and the confidentiality concerns have become a barrier to test-

ing with subsequent missing of opportunities to receive early treatment (Mudhovozi et al., 2012). In this study, approximately one-third of the participants believed that it is appropriate to test a patient for HIV even without the patient's permission. This could be attributed to the students' intentions to know about patients' HIV status so that they can protect themselves. Testing for HIV without consent is considered as a breach of autonomy that states that HIV testing is voluntary and it is ethically mandatory to obtain informed consent from the patient prior to it (UNAIDS, 2004; Huang and Hussein, 2004). The response of the students in regards to this item reflects that almost one third of the students' were unfamiliar with the ethical protocol related to HIV testing. Confidentiality of HIV/AIDS patient was not being considered by more than half of the students where they agreed to inform relatives and sexual partners about the condition of the patient without patient's consent. General Dental Council (GDC) has issued recommendation that dentists should not disclose patients' information without consent (CouncilGDC GD, 1997). This could be due to the reason that partners' notification is an effective strategy to prevent HIV transmission to sexual partners and to prompt treatment for those who were infected with HIV (Hogben et al., 2007). On the other hand it can be caused by the feel of obligation to notify the partners. However, partners' notification without consent can incur undesirable consequences such as marital disharmony and divorce (VanDevanter et al., 2012; Deribe et al., 2008). Despite facing ethical dilemmas between respecting patients' confidentiality and disclosing HIV status to their sexual partners, dental students should not breach patients' confidentiality in their future practices. Instead, they should try to encourage or counsel HIV patients on the importance of disclosing HIV status to their sexual partner. As such, these practices protect patients' right to privacy and decision making with regards to disclosure of patients' HIV status (CouncilGDC GD, 1997). In regards to the environmental care offered to HIV/AIDS patients, more than half of the students reported the preference to clearly mark the rooms /beds and the charts of the patients. Literature revealed that such disclosure practices in healthcare setup may not decrease stigmatization, as stigma is affected by the way the patients contract the disease rather than having segregated units for the HIV/AIDS patients. Similar findings and preference of segregation was reported by nurses in several studies (Surlis and Hyde, 2001; Schietinger and Daniels, 1996). If the segregation and the isolation of patients were actualised in the dental practice, it may result in unethical behaviours and discriminatory practices with subsequent violation of equality and justice resulting in an infringement of HIV-infected individuals' human rights. Another effect of segregation can be the non-disclosure of HIV status (Relf et al., 2009; Petrak et al., 2001).

Dental students' ethical beliefs towards HIV testing, disclosure/confidentiality, and environmental care did not comply with the principles of autonomy, beneficence and justice which stated that a dentist has a duty to respect patients' rights and confidentiality to promote the welfare of all patients. These beliefs were found to contribute to students' negative attitudes towards providing care for PLWHAs. However, the correlation between the items and students beliefs and attitude showed weak correlation. This correlation needs to be investigated further. Within the limitation this study has not attempted to conduct bivariate or regression analysis which

can helpful in finding the factors which may affect the attitudes as an outcome variable.

Ethical beliefs towards policies in healthcare setup revealed that majority of the students felt that the healthcare professional should be informed if the patient is HIV-positive. More than half of the students reported that if health care workers are HIV-infected they should not be allowed to work in the field or carry-on invasive procedures requiring direct patient contact. Guidelines in regards to HIV-infected dentists and whether they are allowed to practice after being diagnosed with the disease is under reviewing and varies worldwide. UK advisory panel for health care workers infected with blood-borne viruses (UKAP) - under department of health UK - in 2007 banned HIV- infected dentists from treating patients as it defined all dental procedures as exposure-prone procedures (EPPS) where a risk of injury to the worker may result in exposure of the patient's open tissues to the blood of the worker (McGoldrick, 2012). In 2009 The British Dental Association (BDA) endorsed the Beijing Declaration and announced that the ruling is "unfair and unlawful" giving the reason that dentistry in general, does not involve situations where the blood from clinician and patient mixes (Erridge, 2007). While in U.S and according to Centers for Disease Control and Prevention (CDC) the guidelines regarding the HIV-infected health care workers (HCW) including the dentists are state-based where every state has its own regulation (CDC, 2008) The states seemed to recognize that the risk of transmission from HCWs to patients was extremely low, especially when the universal precautions already in place are followed (Henderson et al., 2010).

More than one third of the participants felt that PLWHAs received less quality of care and treated like outcasts. In spite of the general agreement that PLWHAs did not behave immorally and they do not deserve to have the disease, more than half of the students believed that the patients should be admitted to separate wards. This finding supports the preference of segregation described earlier by the students and highlights the stigmatization and the fear of transmission of the disease.

In regards to disease transmission, a small percentage of the students believed that mosquitoes or sharing food/drinks with the patient can be one of the modes of transmission of the disease, and that condoms might not be effective in preventing the transmission. Although the misconceptions related to the disease transmission was displayed by a small number of students, but this reflected lack of knowledge about the disease and its transmission and can lead to unnecessary fear of the disease transmission.

Negative attitudes towards individuals with HIV/AIDS may affect dental professionals' intentions to treat HIV-positive patients (Azodo et al., 2010). The fear of HIV infection was cited as one of the most important reasons for developing negative attitudes (Jain et al., 2008). Despite the relatively low risk of HIV transmission in dental settings (Erasmus et al., 2005) results showed that approximately half of the participants demonstrated the fear of becoming infected with HIV infection. This would lead to the likelihood of refusal to treat HIV-positive patients (Shan et al., 2011). Therefore, it was not surprising to note that only half of the participants expressed the willingness to provide care for HIV/AIDS patients. A similar study conducted in United Kingdom reported to have 84% of participants who were willing to provide care for HIV/AIDS patients (Nuttall and Gilbertt, 1993).

This level of willingness was much higher as compared to our study. This could be attributed to the adequate teaching about cross-infection precautions and sterilization procedures received by the dental students from the United Kingdom (Gilbertt and Nuttall, 1994). Besides, majority of the participants were more comfortable giving care to non HIV patients than to HIV-positive patients. Nevertheless, only 10% of them reported discomfort if they had to provide care for HIV-infected family members. This level of discomfort was lower as compared to a study reported in Botswana (Letamo, 2003). This can be attributed to that Malaysian culture where a great emphasis is put on strong family values (Majid, 2008).

Healthcare professionals' negative attitudes are driven by beliefs and myths about HIV and AIDS (Nyblade et al., 2009). Individuals who hold positive beliefs about HIV/AIDS are expected to express more favourable attitudes (Perrin, 2010). In this study, ethical beliefs about HIV testing, confidentiality and environmental care were found to be positively correlated with attitudes. This study highlighted that attitudes were influenced by the beliefs amongst the beliefs adopted by the students was that all HIV/AIDS individuals behaved immorally and that they should be admitted in a separate ward. This was not consistent with the Ministry of Health Malaysia Guidelines which stated that HIV patients should not be isolated unless they are immunocompromised (MOH, 2011). Having separate wards for HIV/AIDS patients may relegate them to receive lesser quality of care and can lead to further stigmatization (Nyblade et al., 2009).

Lack of knowledge and understanding about the disease can influence negative attitudes and willingness to treat HIV-positive patients (Perrin, 2010; Gilbertt and Nuttall, 1994). Appropriate training of dental students in the aspects of treating HIV patients and the integration of HIV clinical experiences had been proved to have positive outcomes in terms of the provision of care for individuals with HIV/AIDS (Mulligan et al., 2006; Seacat et al., 2009; Kuthy et al., 2007). The findings of the study showed the need for innovative curricula that can address the various aspects of the disease and the development of programs and assessments that can strengthen the students' knowledge and practice in regards to the disease (Rogers et al., 2011).

## 5. Conclusion

Within the limitations of this study provides evidences that ethical beliefs have significant influences on attitudes of dental students towards providing care. The dental students' ethical beliefs related to HIV/AIDS varied with the ethical principles stated in the codes of ethics. There is a need to incorporate outcome based education models to assess ethical beliefs influencing the decision making of dental students, aiming enhance positive beliefs which may influence their attitudes towards providing care to PLWHAs.

## Conflict of interest

The authors have declared no conflict of interest.

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