

Knowledge, attitude and practice on standard precautions for prevention of HIV infection among clinical year medical students

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ABSTRACT

Background: Human Immunodeficiency Virus (HIV) can be transmitted through blood, vaginal secretion, infected semen, breast milk as well as blood containing saliva, vomitus and urine. Health care workers (HCWs) are at risk of HIV infection; and standard precautions is a guideline to be followed by HCWs to prevent it.

Objective: This study was aimed to evaluate the level of knowledge, attitude and practice on standard precautions for prevention of HIV infection; and its associated factors.

Materials and Methods: This cross-sectional study was conducted among 200 clinical year medical students from a public university in Malaysia. The clinical year medical students were arranged into strata according to year of study and were randomly selected via stratified random sampling. Each respondent were provided a self-administered questionnaire. There were four sections in the questionnaire to obtain information on socio-demographic characteristics, knowledge, attitude and practice on standard precautions. Both descriptive and analytical analyses such as Chi-squared test were performed.

Results: A total of 162 respondents participated in this study, contributed to the response rate of 81%. The study demonstrated that there was no significant association between level of practice with socio-demographic characteristics such as gender, ethnicity, age, religion, year of study and total family income. However, there was a significant association between level of practice with level of knowledge and attitude ($p < 0.05$). For every one year increase in age, the respondents were 1.7 times ($p = 0.001$) and 1.5 times ($p = 0.012$) more likely to have knowledge score between 50th and 75th percentile and above 75th percentile compared to below 50th percentile, respectively.

Conclusion: It could be interpreted from the findings, that there is a need for further improvement in the knowledge and attitude level among the respondents; which will eventually improve their practice.

KEY WORDS:

HIV; knowledge; attitude; practice; clinical year medical students

INTRODUCTION

Since the first case of HIV infection was recognized in the United States in 1981, HIV has spread rapidly throughout the world. The cause of HIV infection is through the contact of blood. HIV is spread by direct contact with infected body fluids, such as blood, semen, vaginal secretions and breast milk.¹

The most common mode of transmission differs according to countries. According to World Health Organization, an expert group has demonstrated that unsafe sexual practices are responsible for the HIV infections in Sub-Saharan Africa.² However, according to Ministry of Health, Malaysia, the most common mode of transmission of HIV is through intravenous drug injection.³

In Malaysia, the number of HIV infections since 1986 was 76,389. Number of AIDS related deaths since 1986 was 9,155. Females were increasingly infected with HIV and comprise 21% of newly infected individuals nationally in 2011. Approximately 26% reported infections were amongst young individuals aged between 13 to 29 years old. Children aged below 13 years contributed approximately 1% of cumulative total of HIV infections from 1986 to December 2011.⁴ Approximately 79,000 of Malaysians was living with HIV/AIDS.⁵

Malaysia was categorized as a HIV “concentrated epidemic” country according to a comparatively low rate of infection in the general population, as the prevalence of HIV is less than 0.1% from mandatory testing on antenatal mothers in hospital. However, the prevalence of HIV infection ranges from 7% to 19% among high risk group.⁶

In Malaysia, people at risk of getting HIV infection were firstly intravenous drug user (75.1%), followed by heterosexual with multiple sex partners including sex workers (13.6%), homosexual (1.3%), blood products contact like blood receiver, organ donor, organ receiver, needle prick injuries among health care workers with percentage of approximately 0.4%; while baby getting infected by vertical transmission was approximately 0.7%.⁷

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It has been reported that medical doctors, nurse, physician, and hospital staff which had been infected with HIV led to AIDS. In United States 2006, 57 reported HIV infection cases were observed among HCWs in the workplace.⁸ Hence, it is crucial to discover whether they were practicing universal precautions on prevention of HIV infection. The study aimed to investigate the association between the practice on universal precautions on prevention of HIV infection with socio-demographic characteristics and the level of knowledge and attitude towards HIV prevention among clinical year medical students in a public university, Malaysia.

MATERIALS AND METHODS

The study was conducted in a public university, Malaysia. There are six courses of undergraduate offered in the faculty, namely, Doctor of Medicine, Biomedical Science, Nutrition and Community Health, Nursing, Dietetics as well as Environmental and Occupational Health.

This cross-sectional study was conducted among 200 clinical year medical students from a public university in Malaysia due to convenience sampling. The cross-sectional study design aimed to assess the level of knowledge, attitude and practice on standard precautions for prevention of HIV prevention among the medical students from a public university. The clinical year medical students were arranged into strata according to year of study and were randomly selected via stratified random sampling. Medical students in the public university in clinical year (third, fourth and fifth year) were recruited. Malaysian medical students who agreed to participate and available during data collection were included. Students on long medical leave during data collection were excluded. The data collection was conducted for six months duration. Each respondent were provided a pre-tested self-administered questionnaire. The questionnaire has been content validated, in which it was examined by experts from the supervisory committee.

The calculation was shown as below using the following formula.⁹

$$N = \frac{Z^2_{1-\alpha/2} P (1-P)}{d^2}$$

Z_{1-α/2} = 1.96

P = 0.5

d = 0.10, margin of error

$$N = \frac{Z^2_{1-\alpha/2} P (1-P)}{d^2}$$

$$N = (1.96)^2 (0.5) (0.5) / (0.10)^2$$

$$= 3.8416 (0.25) / 0.01$$

$$= 96 \text{ students}$$

To improve the precision of the result, we doubled the size of sample size, so:

$$= (96) (2)$$

$$= 192$$

~ 200 students

The questionnaire comprises five sections, primarily focus on the socio-demographic characteristics (age, gender, race, religion, year of study and total family income); the general knowledge of the respondents on the HIV infection; the

attitude to the practices on universal precautions; and information on whether the respondents are practicing the guidelines in the universal precautions.

The questions for knowledge section consisted of 10 questions on knowledge of HIV infection (standardized alpha of 0.541) and 15 questions on knowledge on standard precautions (Standardized alpha of 0.692). Each correct answer was given one point; while wrong or not sure answer was given 0 point. Total scores in this section were 25 and lowest point was 0 point. Eventually, it would be divided into three groups. Respondents whose score were above the 3rd quartile of total knowledge score would be considered having high knowledge level; while in between 2nd and 3rd quartile would be moderate level of knowledge and below 2nd quartile would be considered as having low level of knowledge.

Attitude section had a total of 15 items that were ranked on a three-point scale with the standardized alpha of 0.890, from three as agree, two for not sure and one point for not agree. Respondents whose score were above 3rd quartile of total attitude score would be considered as having high attitude level; while in between 2nd and 3rd quartile would be moderate level of attitude level and below 2nd quartile would be considered as having low level of attitude.

Practice section had a total of 15 items that were ranked on a three-point scale with the standardized alpha of 0.837, from three as always, two points for sometimes and one point for never. Respondents whose score were above 3rd quartile of total practice score would be considered as having good practice level; while below 3rd quartile would be considered as having poor practice level. Level of practice would be classified into good or poor practice.

The study complied with the principles of the Helsinki Declaration, and was approved by the Ethics Committee of the public university [Reference No UPM/FPSK/100-9/2/M]KETikaPen (JKK_Jan(09)04); dated 28th March 2009]. A written consent was obtained from the respondents prior to data collection.

Data were entered manually and analyzed using the SPSS version 20. Descriptive analyses were performed to determine the distribution based on socio-demographic characteristics. Chi-square test was executed to determine the association between socio-demographic characteristics, and level of knowledge, attitude and practice of prevention on HIV infection. Pearson's correlation was used to determine the correlation of two continuous variables. The odds ratio of knowledge, attitude and practice levels was calculated using multiple logistic regression analysis. The level of significance was set at p < 0.05.

RESULTS

Table I demonstrates the distribution of respondents by socio-demographic characteristics. The majority of respondents are females (54.9%) and Malays (53.1%). The majority of the respondents (49.4%) aged between 22 to 23 years (Mean ± standard deviation: 22.67 ± 1.27 years). There were 86 (53%) Muslim respondents and 76 (47%) non-Muslim respondents.

Table I: Distribution of respondents by socio-demographic characteristics

Socio-demographic Characteristics	Distribution of Respondents	
	Frequency (n)	Percentage (%)
Gender		
Male	73	45.1
Female	89	54.9
Race		
Malay	86	53.0
Chinese	64	39.5
Indian	9	5.6
Others	3	1.9
Age		
20 to 21	35	21.6
22 to 23	80	49.4
24 to 25	47	29.0
Religion		
Islam	86	53.1
Buddhism	52	32.1
Christian	15	9.3
Hinduism	8	4.9
Others	1	0.6
Year of study		
Third year	62	38.3
Fourth year	30	18.5
Fifth year	70	43.2
Total family income		
Below RM1500	29	17.9
RM1501 to RM3500	64	39.5
Above RM3500	69	42.6

Table II: Category of respondents according to the total knowledge, attitude and practice scores

Knowledge on standard precautions for prevention of HIV infection	
Percentile	Score (Total = 25)
25th percentile	19
50th percentile	20
75th percentile	22
Attitude on standard precautions for prevention of HIV infection	
Percentile	Score (Total = 15)
25th percentile	12
50th percentile	13
75th percentile	14
Practice on standard precautions for prevention of HIV infection	
Percentile	Score (Total = 15)
25th percentile	10
50th percentile	12
75th percentile	14

In terms of knowledge on standard precautions for prevention of HIV infection, there were 54 (33.3%) respondents scored less than or equal to 19. In addition, 69 (42.6%) respondents scored 20 to 22; whereas 39 (24.1%) respondents scored more than or equal to 23.

On the other hand, there were 50 (30.9%) respondents obtained less than or equal to 12 for attitude scores. A total of 90 (55.6%) respondents scored 13 to 14; whereas 22 (13.6%) respondents obtained more than or equal to 15 for attitude scores.

Furthermore, there were 106 (65.4%) respondents scored less than or equal to 13; while 56(34.6%) respondents were scored more than or equal to 14 for practice on standard precautions for prevention of HIV infection.

Table III demonstrates that there was no significant association between the levels of practice on standard precautions for prevention of HIV infection with socio-demographic characteristics of respondents.

In addition, age was significantly correlated to total knowledge ($r=0.156$; $p=0.048$) and total practice ($r=0.195$; $p=0.013$) scores; while no significant correlation was observed

Table III: The association between levels of practice on standard precautions for prevention of HIV infection with socio-demographic characteristics of respondents

Level of Practice	Level of Practice			Chi-square value	P-value
	Below 75th percentile n (%)	Above 75th percentile n (%)			
Gender					
Male	49(47.8)	24(25.2)		0.168	0.682
Female	57(58.2)	32(30.8)			
Age					
20-21	23(22.9)	12(12.1)		1.104	0.576
22-23	55(52.3)	25(27.7)			
24-25	28(30.8)	19(16.2)			
Race					
Malay	61(56.3)	25(29.7)		2.450	0.118
Non Malay	45(49.7)	31(26.3)			
Religion					
Muslim	61(56.3)	25(29.7)		2.450	0.118
Non-Muslim	45(49.7)	31(26.3)			
Year of study					
Third year	45(40.6)	17(21.4)		2.372	0.305
Fourth year	19(19.6)	11(10.4)			
Fifth year	42(45.8)	28(24.2)			
Total family income					
Below RM 1500	18(19.0)	11(10.0)		0.541	0.763
RM 1501 – RM 3500	44(41.9)	20(22.1)			
Above RM 3500	44(45.1)	25(23.9)			

Table IV: The association between level of practice on standard precautions for prevention of HIV infection and level of knowledge and level of attitude on standard precautions

Level of Practice	Level of Knowledge			Chi-square value	P-value	Pearson's Correlation	P-value
	Below 50th percentile n (%)	Between 50th and 75th percentile n (%)	Above 75th percentile n (%)				
Below 75th percentile	45(32.7)	52(58.9)	9(14.4)	21.523	<0.001	0.472	0.162
Above 75th percentile	5(17.3)	38(31.1)	13(7.6)				
Level of Practice	Level of Attitude			Chi-square value	P-value	Pearson's Correlation	P-value
	Below 50th percentile n (%)	Between 50th and 75th percentile n (%)	Above 75th percentile n (%)				
Below 75th percentile	48(35.3)	50(45.1)	8(25.5)	49.435	<0.001	0.497	<0.001
Above 75th percentile	6(18.7)	19(23.9)	31(13.5)				

Table V: Odds ratio of having higher levels of knowledge, attitude and practice

Variables	Between 50th and 75th percentile Odds ratio (p-value)	Above 75th percentile Odds ratio (p-value)
	Knowledge	
Gender	1.588 (0.263)	0.743 (0.442)
Age	1.696 (0.001)	1.502 (0.012)
Ethnicity	1.764 (0.063)	1.702 (0.083)
Religion	1.317 (0.208)	1.466 (0.074)
Total family income	1.000 (1.000)	1.275 (0.359)
Attitude		
Gender	1.887 (0.091)	2.516 (0.023)
Age	0.832 (0.215)	0.979 (0.892)
Ethnicity	0.809 (0.431)	0.653 (0.161)
Religion	0.676 (0.061)	1.171 (0.476)
Total family income	1.689 (0.044)	1.537 (0.112)
Practice		
Gender	1.154 (0.689)	0.554 (0.159)
Age	0.776 (0.085)	1.035 (0.837)
Ethnicity	0.765 (0.312)	0.783 (0.419)
Religion	0.926 (0.679)	0.863 (0.500)
Total family income	1.138 (0.606)	0.799 (0.419)

between age and total attitude ($r=0.127$; $p=0.108$) score. On the other hand, total family income was significantly correlated to total attitude score ($r=-0.159$; $p=0.044$); while no significant correlation was observed between total family income and total knowledge ($r=0.038$; $p=0.630$) and total practice ($r=-0.043$; $p=0.586$) scores.

Table IV demonstrates that there was a significant association between the level of practice on standard precautions for prevention of HIV infection and level of knowledge on standard precautions ($p<0.05$). It also shows that there was a significant association between the level of practice on standard precautions for prevention of HIV infection and level of attitude on standard precautions ($p<0.05$).

DISCUSSION

The main objective of this study was to investigate the knowledge, attitude and practice of standard precautions for HIV prevention among clinical year medical students when taking care patient with HIV/AIDS; and the socio-demographic characteristics among the respondents. The total number of respondents participated in this study was 162 respondents, contributed to the response rate of 81%.

In terms of year of study, majority of the respondents were fifth year medical students with 43.2%; followed by third year medical students, 38.3%; and fourth year medical students with only 18.5%. The response rate for fifth year medical students was 100% and for third year medical students, the response rate was 91%. However, the response rate for the fourth year medical students was only 48%. It was principally because all the fourth year medical students were in their elective posting; whereas some of them were in the rural area with problem accessing to the internet. Hence, they were unable to answer our self-administered questionnaire through internet.

In terms of knowledge on standard precautions for prevention of HIV infection, the distribution revealed that most of the clinical medical students (42.6%) able to score between 80% and 88%. Comparing to the study on the knowledge and behaviour of nurses in Owerri, Imo State, Nigeria¹⁰ which revealed that nurse had moderate level of knowledge on HIV prevention with mean score of only 51.4%. On the other hand, the distribution in terms of attitude on standard precautions for prevention of HIV infection demonstrated that most of the clinical medical students (55.6%) able to score between 87% and 93%. In addition, the majority of the respondents (56.3%) scored between 80% and 93% for practice on standard precautions for prevention of HIV infection. Comparing to the study on knowledge and practice of HCWs and student on universal precautions in hospitals of Mazandaran Province which demonstrated that only 33.9% of student will wear gloves before caring for patient if they have wound, the finding was better among the clinical medical students in the present study.¹¹

Significant association between level of practice on standard precautions for prevention of HIV infection with the level of

knowledge on standard precautions for prevention of HIV infection was observed. In addition, significant association between level of practice on standard precautions for prevention of HIV infection with the level of attitude on standard precautions for prevention of HIV infection was found too. It could be interpreted from the findings, that there is a need for further improvement in the knowledge and attitude level among the respondents; which will eventually improve their practice. The level of knowledge and attitude among the respondents may be in tandem to the lacking of specific educational courses having been held.¹²

For every one year increase in age, the respondents were 1.7 times ($p=0.001$) and 1.5 times ($p=0.012$) more likely to have knowledge score between 50th and 75th percentile and above 75th percentile compared to below 50th percentile, respectively. These findings signify that the age at the onset of HIV infection has decreased considerably over the past decade. The need continues for concerted efforts to prevent HIV infection among adolescents and young adults. Research studies concentrating on the risk factors for transmission and scrutinizing the efficacy of educational campaigns or preventive vaccines should highlight the enrolment of young people.¹³ In addition, it is believed that young peoples' ability to protect themselves was low to moderate.¹⁴

This study was limited to the clinical year medical students in the present study. Thus, the result of this study could not represent the population of clinical year medical students in Malaysia. However, it is useful as a reference for other researchers to carry out this study in the national and international level. Besides, it is useful for HCWs to organize health promotion among clinical year medical students.

The study had some limitations that warrant indication. Findings from this study may only be able to be compared with other studies done among the HCWs and nursing students, but not much on the clinical year medical students due to the scarcity of studies available. Furthermore, the low response rate among fourth year medical students may lead to bias. In addition, different exposures of respondents to the information on HIV infection, standard precaution procedures or direct contact with HIV patients may be the potential confounder for this study.

Findings of the study suggest that campaign or workshop about HIV/AIDS and standard precautions for prevention of HIV infection should be conducted in order to improve the level of knowledge among clinical year medical students. Evaluation shall be made among clinical year medical students from time to time. In addition, the mass media may play a crucial role to improve the level of knowledge and attitude among clinical year medical students. Information about HIV/AIDS and standard precautions should be published more frequently in the pamphlet, magazine and newspaper. On the other hand, the level of attitude may be improved among the clinical year medical students by having group and peer intervention. Religion may be used as a channel to increase awareness about HIV and prevention. Peer should share information and experience together. As observed in the several country reports, religious beliefs are directly associated with representations of HIV/AIDS,

explicitly its causes and effects. The moral and spiritual attitudes related to these beliefs may be employed to develop responsibility towards oneself and others with regard to the infection, and may also develop solidarity toward sick and infected people. Such solidarities are more particularly active among specific spiritual leaders and religious communities, such as, Christian missionaries and Muslims Imams.¹⁵ Nonetheless, more surveys on HIV and standard precautions to investigate the level of practice among clinical year medical students should be conducted.

CONCLUSION

The majority of the respondents (42.6%) were categorized as having moderate level of knowledge on standard precautions for HIV prevention; and only 24.1% of the respondents were classified as having high level of knowledge on HIV/AIDS and standard precautions for HIV prevention. The majority of the respondents (50.6%) were having moderate attitude towards standard precautions; and only 13.6% of the respondents having high level of attitude on standard precautions. Hence, it could be interpreted from the findings, that there is a need for further improvement in the knowledge and attitude level among the respondents; which will eventually improve their practice.

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