

Knowledge of modes of HIV transmission among public secondary school students in urban and rural areas in Malaysia

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Abstract: The school students are of particular importance in the HIV/AIDS awareness policies at both local and international level. This study was conducted to assess the level of knowledge of the modes of HIV transmission among urban and rural public secondary school students in Malaysia. In this cross-sectional study, post local ethics approval, 600 self-administered questionnaires were randomly disseminated to students in 6 different secondary schools and areas (i.e. 3 urban schools and 3 rural schools). Data were descriptively and inferentially analyzed using Statistical Package of Social Sciences (SPSS®), version 17. The Pearson Chi-Square test was applied where applicable. Most respondents had heard about HIV (overall response rate: 96.2%). However, 8.9% of rural respondents (27/302) never heard about HIV and were excluded. Therefore, 275 urban students (Kuala Lumpur, Selangor, and Pahang) and 275 rural students (Terengganu) who successfully completed and returned the questionnaires were included in data analysis. Many respondents were female and within the age range of 15-16 years old. Most respondents in both areas knew that sharing needles can transmit HIV (93.5% urban; 97.1% rural). Out of 15 items concerning transmission modes of HIV, eight items showed significant values ($p < 0.05$) of rural vs. urban: saliva, urine, tears, using same swimming pool, blood transfusion, mosquito bites, sharing foods and donating blood to HIV patients. About 90.2% and 79.6% of respondents in urban and rural areas used television and newspapers as main source of knowledge on HIV, respectively. The implementation of incessant HIV and AIDS education programme could be useful in order to enhance and sustain awareness concerning HIV/AIDS among secondary school students.

Keywords: Mode of HIV transmission, knowledge, secondary school students.

INTRODUCTION

Human immunodeficiency virus (HIV) is a retrovirus that is accountable for acquired immunodeficiency syndrome (AIDS). AIDS has become pandemic disease that threatens people of all races today (Brook, 1999). Globally, according to the Joint United Nations Programme on HIV/AIDS (UNAIDS) (2009), the total number of adults and children deaths due to HIV was 2 million in 2008 as compared to 2001, which recorded 1.9 million of deaths. The estimated number of people living with HIV (PLWH) was about 33.4 million (31.1 to 35.8 million). This alarm prevalence of PLWH reported in 2008 was 20% higher than the case reported in 2000. In Malaysia, by December 2007, the estimated number of PLWH was 69,000, out of a total population of 25.3 million (Mesquita *et al.*, 2008; UNGASS, 2008).

The infection of HIV can be divided into four different stages that varied from primary infection to no return to backward stage of HIV even though the patient gets better (Déirdre Hollings worth *et al.*, 2008). There are 3 important modes of HIV transmission, which are sharing

HIV contaminated needles, sexual transmission and from HIV infected mother to child during pregnancy or breastfeeding (Wong *et al.*, 2008). HIV contaminated needles that usually used by drug abusers have been the major cause of parenteral transmission of HIV. The probability of HIV transmission from receptive vaginal intercourse is 0.1% to 0.2% and for receptive anorectal intercourse is 0.1% to 3% per sexual contact. For paediatric, HIV infection via vertical transmission is the most common cause. The risk of HIV infection from mother to child was 25% in absence of breast feeding or antiretroviral treatment. HIV does not transmit by sharing meals, mosquito bites, sharing toilet and public swimming pools (Dipiro *et al.*, 2009).

In Africa, heterosexual exposure is the main mode of transmission of HIV in sub Saharan Africa (UNAIDS, 2009). It was estimated that 94% of HIV infection caused by heterosexual exposure in Swaziland (Mngadi *et al.*, 2009). Injection drug user (IDU) is also a major factor contribute to the high risk of infection of HIV in sub Saharan. In Nairobi, Kenya, 36% of the IDUs were tested with positive HIV (Odek-Ogunde *et al.*, 2004). In some countries in Asia, IDUs is also one of the major modes of

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transmission of HIV (UNAIDS, 2009). About 30% to 50% of IDUs in Thailand were believed to have positive HIV (National AIDS Prevention and Alleviation Committee, 2008). In China, heterosexual transmission became the major mode of transmission of HIV, which previously dominated by IDUs (Wong *et al.*, 2008). On the other hand, Bangladesh previously known as having low level of epidemic of HIV transmission but now changed to one of the concentrated IDUs epidemics of HIV in Asia (Azim *et al.*, 2008).

The knowledge of HIV is still in the sub-optimal. In Malaysia, 35% of adult Malaysian admitted to have unprotected sex without knowing their partner sexual history, as claimed by Durex Global Sex Survey (2005). In Turkey, sexual education was rarely being discussed in the family and among their intimate themselves. As a result, their knowledge about sexual transmitted diseases like HIV was insufficient (Ungan & Yaman, 2003). The HIV/AIDS is no longer restricted to the high risk urban population but also has spread to rural areas (Meundi *et al.*, 2008). Study was done in Malawi, and they proved that although the use of condoms remained largely unsupported, people lived in urban areas had more knowledge about HIV compared to people live in rural areas. In rural, their knowledge about HIV was influenced by their cultural factors (Chiang *et al.*, 2009). Exposure to various knowledge resources on HIV/AIDS, ranging from mass media campaigns, leaflets, posters, booklets and also prevention activities, must be started and implemented at pedagogical education stage. For instance, in Greece, its national school of public had programmes of HIV prevention that conducted by training teachers delivered straight to the students. Thus, deficiencies of knowledge in HIV/AIDS were important points to be focused on (Lal *et al.*, 2000; Tapia-Aguirre *et al.*, 2004; Lal *et al.*, 2008). Therefore this study aimed to evaluate the level of knowledge on modes of HIV transmission among urban and rural public secondary school students in Malaysia.

MATERIALS AND METHODS

This cross-sectional survey design was conducted post ethics approval from the Research Ethics Committee of the Faculty of Pharmacy, University Technology MARA (UiTM) Puncak Alam Campus. Six public secondary schools were involved in this study that were further divided into two groups of rural and urban schools according to the definition in year 2000 by the Department of Statistics, Malaysia (2010), and Town and Country Planning Department of Malaysia (2010). Urban and rural areas are not legally defined administrative areas but are statistically defined to distinguish areas with certain socio-economic characteristics. The rural schools were from Terengganu which consisted of Sekolah Menengah Kebangsaan Cheneh Baru, Sekolah Menengah Binjai and Sekolah Menengah Kijal, while urban schools

were from Selangor, Kuala Lumpur and Pahang, which consisted of Sekolah Menengah Seksyen 7 Shah Alam, Sekolah Menengah Bandar Tun Abdul Razak, and Sekolah Menengah Agama Al-Ihsan, Kuantan, respectively.

The projected sample size of respondents needed was 550 public secondary school students based on a 95% confidence interval and margin of error of 5% with an estimated 50% response rate (Raosoft[®], 2010). Randomly selected students who attended school in that study day were recruited in this study. Inclusion criteria included age of respondents between 13 to 18 years old, attending public secondary schools, whilst exclusion criteria included teachers, nonacademic workers, and parents.

From 31st July to 21st August in 2010, the data were collected through direct dissemination of self-administered questionnaires which adopted from Brook (1999) and Laland co-workers (2000). The questionnaire consisted of three domains that recorded the demographic details of the respondents (part A), knowledge of modes of HIV transmission (part B) and source of knowledge of HIV (part C).

All the data obtained was then examined and the responses were coded. All data were checked twice to avoid any error in key-in data process. Data were analyzed using Statistical Package of Social Sciences (SPSS[®]), version 17. Descriptive and inferential analyses were used to present the result obtained. The Pearson Chi-Square test was applied where applicable. The *p* value of less than 0.05 was considered as statistically significant.

RESULTS

Out of 600 disseminated questionnaires, only 577 returned questionnaires were completely answered with overall response rate of 96.2%. Out of 302 respondents from rural areas, 27 of them were excluded because they did not ever hear about HIV and answered "No" for question 1. Thus, total respondent included in the analysis was 550 students. Out of 550 respondents participated in this survey, 275 respondents were from rural and urban areas each. Majority of the respondents were between 15 to 16 years old for both areas, followed by age of between 17 to 18 years old and 13 to 14 years old. Also majority of the respondents were female in both areas (Table 1).

DISCUSSION

The survey was conducted randomly in 6 schools from urban and rural areas. Majority of the recruited respondents were female due to higher ratio of female students studying in the public schools compared to males.

Table 1: Respondents (n, %) according to demographic data

Demographic data	Range of age (years old)	Urban (n = 275)	Rural (n = 275)
Age	13 to14	58 (21.1)	4 (1.5)
	15 to16	151 (54.9)	181 (65.8)
	17 to18	66 (24.0)	90 (32.7)
Sex	Male	100 (36.4)	49 (17.8)
	Female	175 (63.6)	226 (82.2)

There respondents from urban schools were more alert about HIV compared to respondents in rural due to urban respondents had more resources on HIV knowledge than rural. All respondents from urban schools answered they ever heard about HIV, while 91.2% of the respondents from rural schools ever heard concerning HIV which was lower than reported by Lal *et al* (2000) (100%) but higher than reported by Siziya *et al* (2008) (49.9%). More respondents from urban schools knew that HIV patient shows symptoms like fever and fatigue compared to respondents from rural schools. However, more respondents from rural schools knew that Malaysian government take action to prevent spreading of HIV as compared to urban respondents.

Table 2: Knowledge of respondents (n, %) on whether HIV patient shows any

	Urban	Rural
Yes	180(65.5)	162 (58.9)
No	95 (34.5)	113 (41.1)
Total	275(100)	275 (100)

Table 3: Knowledge of respondents (n, %) on whether they aware of government action to prevent spread of HIV

	Urban	Rural
Yes	233 (84.7)	256 (93.1)
No	42 (15.3)	19 (6.9)
Total	275 (100)	275 (100)

Table 4 shows that the respondents in urban and rural areas were aware of the main routes of transmission of HIV. Most respondents in both areas knew that sharing needles was the most common mode of HIV transmission.

Out of 15 items from part B, 12 items were wrongly correlated with HIV transmission. About 29.1% of urban respondents and 29.2% of rural respondents answered 'yes' to those questions and misunderstood on how HIV is passed from one person to another person. For statements that correlated with HIV transmission, which the answers should be true, 90.9% and 93.8% of the respondents from urban and rural areas correctly answered those questions, respectively. Besides that, there were significant relationships between the location of the schools and the level of knowledge on HIV transmission among the respondents. Although they knew main modes of transmission of HIV, some of the respondents still get confused with other modes of transmission such as HIV can be transmitted through urine, saliva and share foods

with HIV patients. Other findings by Azodo and colleagues (2007) showed that dental nursing students in South Western Nigeria possessed low knowledge regarding HIV/AIDS. Latter authors further discussed that misconception regarding transmission by mosquito bite was 29.2%, and 61.8% of the respondents wanted HIV patients to be quarantined to prevent spread of HIV. Rahman (2009) reported that in the urban areas, 61.6% of women knew at least one correct way to avoid AIDS but the corresponding figure for rural women was only 31.3%, means that 37.7 % and 67.7 % of urban and rural women respectively still did not know how to avoid AIDS. Siziya *et al* (2008) demonstrated that 60.5% of women in Iraq did not know that breast milk is responsible for transmission of HIV from infected HIV mother to child. They further discussed that adequate knowledge regarding HIV/AIDS among Iraqi women is very limited and associated with social life (Siziya *et al.*, 2008).

The current results somehow proved that a portion of secondary school students from both areas still possessed diminutive understanding on how HIV can be transferred. So, parents, teachers, government and non-government bodies must put extra effort to educate the students about modes of transmission of HIV. Furthermore, with appropriate knowledge on how HIV is transmitted, they can communicate better with HIV patients with less discrimination and stigmatization.

In agreement with electronic media as the leading source of information (76.4%) (Azodo *et al.*, 2007), since majority of the urban students get information regarding HIV via television, the government must increase HIV education programme and advertisement on television, which help to increase knowledge and awareness to prevent HIV/AIDS. The power of internet is highly acknowledged nowadays. Social broadcasting technologies can also incorporated fundamental information on HIV/AIDS that can be accessed and viewed worldwide. Besides, parents must be emphasized in educating their children on acquaintance of HIV. Furthermore since students' second home is school, thus teachers also should play imperative roles to inform students at least basic information about HIV/AIDS. Hence, there should be a big push to enhance teaching effort in schools. Other good suggestion would be HIV infected persons themselves give talk personally to the school students about personnel experience as well as modes of transmission of HIV (Brook, 1999). This current

Table 4: Knowledge of respondents (n, %) on modes of transmission of HIV

Modes of transmission of HIV	Answer	Urban (n = 275)	Rural (n = 275)	P value
Saliva	Yes	139 (50.6)	143 (52.0)	*0.024
	No	82 (29.8)	100 (36.4)	
	Do not know	54 (19.6)	32 (11.6)	
Urine	Yes	52 (18.9)	51 (18.6)	*0.001
	No	107 (38.9)	148 (53.8)	
	Do not know	116 (42.2)	76 (27.6)	
Tears	Yes	22 (8.0)	36 (13.1)	*0.001
	No	170 (61.8)	181 (65.8)	
	Do not know	83 (30.2)	58 (21.1)	
Using same swimming pools	Yes	67 (24.4)	50 (18.2)	*0.002
	No	118 (42.9)	160 (58.2)	
	Do not know	90 (32.7)	65 (23.6)	
Blood transfusion	Yes	248 (90.2)	261 (94.9)	*0.029
	No	8 (2.9)	8 (2.9)	
	Do not know	19 (6.9)	6 (2.2)	
Using same toilet	Yes	17 (6.2)	15 (5.5)	0.224
	No	232 (84.4)	221 (80.4)	
	Do not know	26 (9.5)	39 (14.2)	
Using common clothes	Yes	44 (16.0)	34 (12.4)	0.099
	No	189 (68.7)	181 (65.8)	
	Do not know	42 (15.3)	60 (21.8)	
Using common cutlery	Yes	101 (36.7)	103 (37.5)	0.939
	No	127 (46.2)	123 (44.7)	
	Do not know	47 (17.1)	49 (17.8)	
HIV infected mother to foetus	Yes	245 (89.1)	246 (89.5)	0.970
	No	9 (3.3)	8 (2.9)	
	Do not know	21 (7.6)	21 (7.6)	
Mosquito bites	Yes	79 (28.7)	105 (38.2)	*0.003
	No	127 (46.2)	130 (47.3)	
	Do not know	69 (25.1)	40 (14.5)	
Hugging HIV infected patients	Yes	49 (17.8)	41 (14.9)	0.614
	No	192 (69.8)	196 (71.3)	
	Do not know	34 (12.4)	38 (13.8)	
Sharing foods	Yes	113 (41.1)	93 (33.8)	*0.004
	No	91 (33.1)	129 (46.9)	
	Do not know	71 (25.8)	53 (19.3)	
Donating blood to HIV patient	Yes	238 (86.5)	236 (85.8)	*0.011
	No	16 (5.8)	30 (10.9)	
	Do not know	21 (7.6)	9 (3.3)	
Holding hand of HIV patient	Yes	41 (14.9)	55 (20.0)	0.089
	No	192 (69.8)	192 (69.8)	
	Do not know	42 (15.3)	28 (10.2)	
Sharing needles	Yes	257 (93.5)	267 (97.1)	0.078

*p value < 0.05 = significant

Rejoinder on non-transmitting routes of HIV showed quite same structure for respondents in both areas. Most of them totally disagreed that HIV can be transmitted by using same toilet with HIV patients (urban: 84.4%; rural: 80.4%). High percentage of respondents in rural and urban areas agreed that HIV can be transmitted via blood transfusion (urban: 90.2%; rural: 94.9%). Only 2.5% and 1.8% of the respondents from urban and rural areas denied the fact that HIV can be transmitted by sharing contaminated needles, respectively. Only eight modes of HIV transmission were found to be significant in comparing between urban and rural respondents.

study demonstrated 53.8% of public secondary school students obtained information on HIV via friends, therefore peer education about HIV can be effective in influencing not only positive knowledge but behaviour as well (Azodo *et al.*, 2007; Van der Maas & Otte, 2009). Since students also get to know information about HIV from magazines and newspapers, so information about HIV in reading materials supposed to be doubled.

Table 5: Source of knowledge of HIV among respondents (n, %)

Source	Urban (n = 275)	Rural (n = 275)
Television	248 (90.2)	117 (42.5)
Magazines	204 (74.2)	88 (32)
Newspapers	225 (81.8)	219 (79.6)
Friends	138 (50.2)	158 (57.5)
Teachers	181 (65.8)	219 (79.6)
Parents	155 (56.4)	125 (45.5)

The result shows that television was the main source of knowledge about HIV for respondents from urban schools. On the contrary, newspapers and teachers were the main sources of knowledge about HIV for rural respondents.

The findings of the present study regarding the needs to improve the knowledge of HIV among school students by educating the students using school-ridden education campaigns were consistent with the findings of previous studies (Tavoosi *et al.*, 2004; Jaiswal *et al.*, 2004; Peltzer & Promtussananon, 2005; Cheng *et al.*, 2008; Gupta *et al.*, 2013).

Although, in last two decades different studies were conducted to assess the knowledge of HIV, yet these studies assessed the knowledge of mode of transmission generally and briefly. On contrary to these studies, the present study primarily focused on the modes of transmission of HIV because the modes of transmission of HIV, and source of HIV are considered as one of the most important issues to address in school aged students. Furthermore, in this study, knowledge of students from the rural and urban area school was assessed that previously was lacking in literature. The level of knowledge of students from the school in rural and urban areas is very imperative for devising the future disease-based educational campaigns and programmes.

The present study has confronted some limitations. There were minor difficulties while distributing questionnaires to the students. Some of the students were not interested to participate and claimed not having ample time to complete the study instrument. However, this current study successfully recruited the recommended sample size hence the results can be generalized to the whole population of public secondary school students in both

study rural and urban areas in Malaysia. Based on authors' current knowledge, this study is primary to be reported hence larger areas involving different states with larger sample size of respondents to ensure future findings can be generalized to the whole population of public secondary school students in Malaysia.

CONCLUSION

Public secondary school students in urban and rural areas possessed similar level of knowledge about modes of transmission of HIV. The misconceptions of how HIV is transmitted still existed in both areas. Continuous education of HIV / AIDS delivered by electronic and printed media is imperative to enhance knowledge on HIV/AIDS consequently reduce the epidemic of HIV / AIDS in future.

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