

Research Article

Frequent Misconceptions and Low-to-Moderate Knowledge of HIV and AIDS amongst High-School Students in Malaysia

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We describe the findings from a survey of 572 high-school students aged between 15 and 19 years in the city of Seremban, Negeri Sembilan state, Malaysia. Knowledge regarding HIV and AIDS is assessed using a self-administered validated 48-item questionnaire modified from the validated HIV Knowledge Questionnaire (HIV-K-Q). Our questionnaire was divided into 4 parts assessing different areas in HIV/AIDS, namely, general knowledge of risk factors; knowledge of modes of transmission of HIV; knowledge of HIV prevention; knowledge of HIV testing. The answers were divided into “correct”, “wrong”, and “I don’t know”. One mark was awarded for every “correct” answer; one mark was deducted for every “wrong” answer, while no mark was awarded for “I don’t know”. The total marks for each student were converted to percentage and used for analysis. The average total score percentage was 64.7%. The highest scores were in the area of knowledge of mode of HIV transmission, while the lowest scores were in the area of knowledge of HIV testing. The level of HIV knowledge was correlated with age of the students ($P < 0.05$) but not with gender and ethnicity. Our paper revealed frequent misconceptions and a general low-to-moderate level of knowledge amongst the high school students surveyed.

1. Introduction

The first case of human immunodeficiency virus (HIV) infection in Malaysia was reported in 1986. Since then, the incidence of HIV and acquired immune deficiency syndrome (AIDS) has been on the rise. As of December 2009, Malaysia has recorded a total of 87,710 persons with HIV. An estimated 105,439 people are currently living with HIV [1]. HIV transmission in Malaysia is mainly through injecting drug use and heterosexual transmission. HIV prevalence is highest in the 20–29 and the 30–39 years old age groups, affecting mainly males and Malay ethnicity.

Prevention strategies in the form of sex education by educating the young in schools are vital in forming the

basis of fighting HIV/AIDS in Malaysia. The Malaysian government has taken measures to curb the rise of HIV/AIDS transmission through various taskforces, health campaigns and talks, national strategic plans, national bodies, conferences, and forums. One specific program which was launched for youths in 1996 was PROSTAR (The Healthy without AIDS Programme for Youths) to ensure that youths are well aware and better equipped with knowledge regarding HIV/AIDS and high-risk behaviour related to it. The PROSTAR program has benefited 667,000 youths nationwide [2].

A recent nationwide survey on HIV/AIDS-related knowledge amongst young people aged 15–24 years old revealed persistent misconceptions about HIV/AIDS [3]. Our study was designed to assess the specific knowledge of HIV/AIDS

among Malaysian high-school students between the age of 15 and 19 years old which would provide useful data which may help guide the development prevention strategies specific for these young people.

2. Materials and Methods

2.1. Study Setting. This study was a descriptive cross-sectional study conducted from May 2009 to June 2009. Six hundred students between the age of 15 and 19 years old from four national secondary schools in the city of Seremban city were invited to participate in this survey out of which 572 students eventually completed the questionnaire giving a response rate of 95.3%.

2.2. Data Collection. Data were collected by the research team using a validated 48-item questionnaire which was modified from the validated HIV Knowledge Questionnaire (HIV-K-Q). The latter is a self-administered instrument which was developed by Carey et al. using formative work, item and factor analyses to assess knowledge needed for HIV prevention. Respondents were asked to read 45 statements about HIV and indicate whether they think the statement is true, false, or they indicate that they “don’t know”. The questionnaire was validated and was considered appropriate for people with at least 4th to 7th grade education (between 9–12 years old) and be completed within 7 minutes [4, 5].

The study questionnaire was piloted on 5% of the sample population, and adjustments were made to the questionnaire after-piloting. The words “yes”, “no”, and “I don’t know” were used in place of “true”, “false”, and “don’t know” for answers in the HIV-K-Q questionnaire. This change was made to better reflect the way English is usually spoken and understood in this part of the world where a “yes” is understood as “true” and a “no” is understood as “false”. The students were asked to read 48 statements regarding various aspects of HIV/AIDS and provide their feedback by circling either “yes”, “no”, or “I don’t know”. Each student was given 15 minutes without interruption to complete the questionnaire at their institution.

Our questionnaire was set in the English language and was divided into 4 parts. Part 1 consisted of 13 questions which assessed the general knowledge of risk factors and outcome of HIV/AIDS. Part 2 has 21 questions which assessed the knowledge of mode of transmission of HIV/AIDS. Part 3 has 7 questions which assessed the knowledge of HIV/AIDS prevention and finally, part 4 has 7 questions which assessed the knowledge related to HIV testing. In addition, demographic data such as age, gender, year of education, and ethnicity were also collected.

2.3. Ethical Considerations. Prior to the survey, the students were informed about the general objectives of the study and that the questionnaire was anonymous in order to ensure confidentiality of the information provided. Informed consent was obtained verbally. The study was approved by the International Medical University Ad-hoc Research

TABLE 1: Demographic characteristics of the student population ($N = 572$).

| Demographic variable | Number (%) |
|----------------------|-------------|
| Gender | |
| Male | 284 (49.7%) |
| Female | 288 (50.3%) |
| Ethnic group | |
| Malay | 97 (17.0%) |
| Chinese | 357 (62.4%) |
| Indians | 114 (19.9%) |
| Others | 2 (0.7%) |
| Age groups (years) | |
| 15 | 158 (27.6%) |
| 16 | 103 (18.0%) |
| 17 | 195 (34.1%) |
| 18 | 94 (16.4%) |
| 19 | 22 (3.8%) |

Committee, the National Ministry of Education of Malaysia, and the Negeri Sembilan State Ministry of Education.

2.4. Statistical Analysis. The level of HIV and AIDS knowledge was assessed using a scoring system. One mark was awarded for each correct answer, one mark was deducted for each wrong answer, while no mark was awarded for an “I don’t know” answer. The total marks for each completed questionnaire were then converted into percentage scores. The total score and sectional scores were then used for analysis. The ANOVA test was selected to compare the total scores between age, gender, and race and to determine if there was any association between the demographic variables. Statistical significance was set at $P < 0.05$. All statistical analyses were done using SPSS for Windows version 17.

3. Results

3.1. Demographic Characteristics. The demographic characteristics of the students are shown in Table 1. The male: female ratio was nearly 1 : 1. Students from the Chinese ethnic group were the largest group followed by Indians and Malays. Students aged 17 years were the largest group ($N = 195$), while those aged 19 years were the smallest ($N = 22$).

3.2. Knowledge about HIV/AIDS. The scores for each question in the questionnaire are detailed in Table 2. The mean percentage for part 1, 2, 3, and 4 of the questionnaire was 61.2% (SD 15.6), 72.2% (SD 18.3), 62.0% (SD 16.1), and 51.3% (SD 13.5), respectively. The percentages revealed moderate (part 1, 2, and 3) to low (part 4) levels of knowledge about HIV and AIDS. The mean total score percentage was 64.7% (SD 12.3).

3.3. Differences by Age, Gender, and Ethnicity. The mean percentage scores with reference to age and ethnicity are detailed in Table 3. Using age 15 years as the reference age,

TABLE 2: Knowledge about HIV/AIDS among high-school students in Seremban, Malaysia ($N = 572$).

| No. | Question | Correct | Wrong | I don't know |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|--------------|
| Part 1: general knowledge (risk factors and outcomes) | | | | |
| 1 | HIV and AIDS are the same thing | 313 (54.7%) | 182 (31.8%) | 77 (13.5%) |
| 2 | AIDS is now curable | 342 (59.8%) | 106 (18.5%) | 124 (21.7%) |
| 3 | AIDS is the cause of HIV | 169 (29.5%) | 277 (48.4%) | 126 (22.0%) |
| 4 | HIV cannot survive outside of the human's body | 275 (48.1%) | 127 (22.2%) | 170 (29.7%) |
| 5 | People who are infected with HIV quickly develop the signs or symptoms of being infected | 302 (52.8%) | 132 (23.1%) | 138 (24.1%) |
| 6 | A mother with HIV positive cannot have children | 353 (61.7%) | 121 (21.2%) | 98 (17.1%) |
| 7 | All individuals who are HIV positive will develop AIDS | 158 (27.6%) | 240 (42.0%) | 174 (30.4%) |
| 8 | Sexual intercourse with a virgin will cure AIDS | 365 (63.8%) | 123 (21.5%) | 84 (14.7%) |
| 9 | It is possible to know a person is HIV positive by looking at them | 369 (64.5%) | 97 (17.0%) | 106 (18.5%) |
| 10 | AIDS is a hereditary disease | 136 (23.8%) | 204 (35.7%) | 232 (40.6%) |
| 11 | AIDS is mostly seen in the developing or underdeveloped countries, mostly in countries least able to afford to care for infected people | 299 (52.3%) | 109 (19.1%) | 164 (28.7%) |
| 12 | Only drug users, sex workers, and the homosexual or gay community get infected with HIV | 313 (54.7%) | 192 (33.6%) | 67 (11.7%) |
| 13 | There is a vaccine for AIDS | 280 (49.0%) | 97 (17.0%) | 195 (34.1%) |
| Part 2: transmission of HIV | | | | |
| 14 | Coughing | 369 (64.5%) | 119 (20.8%) | 84 (14.7%) |
| 15 | Sneezing | 389 (68.0%) | 95 (16.6%) | 88 (15.4%) |
| 16 | Hugging | 458 (80.1%) | 46 (8.0%) | 68 (11.9%) |
| 17 | Kissing | 272 (47.6%) | 238 (41.6%) | 62 (10.8%) |
| 18 | Shaking hands | 490 (85.7%) | 43 (7.5%) | 39 (6.8%) |
| 19 | Sharing a glass of water | 298 (52.1%) | 210 (36.7%) | 64 (11.2%) |
| 20 | Sharing clothes | 437 (76.4%) | 78 (13.6%) | 57 (10.0%) |
| 21 | Sharing food and utensils | 280 (49.0%) | 212 (37.1%) | 80 (14.0%) |
| 22 | Sharing toothbrush | 214 (37.4%) | 287 (50.2%) | 71 (12.4%) |
| 23 | Sharing public toilet and swimming pools | 399 (69.8%) | 80 (14.0%) | 93 (16.3%) |
| 24 | Urine | 276 (48.3%) | 183 (32.0%) | 113 (19.8%) |
| 25 | Saliva | 268 (46.9%) | 218 (38.1%) | 86 (15.0%) |
| 26 | Tears | 389 (68.0%) | 72 (12.6%) | 111 (19.4%) |
| 27 | Blood products/transfusion | 464 (81.1%) | 48 (8.4%) | 60 (10.5%) |
| 28 | Sharing a needle | 453 (79.2%) | 59 (10.3%) | 60 (10.5%) |
| 29 | Breastfeeding | 312 (54.5%) | 135 (23.6%) | 125 (21.9%) |
| 30 | Sexual intercourse | 488 (85.3%) | 30 (5.2%) | 54 (9.4%) |
| 31 | Semen | 351 (61.4%) | 80 (14.0%) | 141 (24.7%) |
| 32 | Vaginal Fluid | 383 (67.0%) | 60 (10.5%) | 129 (22.6%) |
| 33 | Mother to child in pregnancy | 430 (75.2%) | 65 (11.4%) | 77 (13.5%) |
| 34 | Insect bite | 369 (64.5%) | 103 (18.0%) | 100 (17.5%) |
| Part 3: prevention of HIV | | | | |
| 35 | Using latex condom is known to reduce the risk of HIV infection tremendously | 361 (63.1%) | 69 (12.1%) | 142 (24.8%) |
| 36 | Using a natural skin (lambskin) condom can protect a person from getting HIV | 235 (23.6%) | 171 (29.9%) | 266 (46.5%) |
| 37 | Use of specific drug which is given before, during, and after birth to both mother and child is known to greatly decrease the risk of baby infected with HIV | 175 (30.6%) | 159 (27.8%) | 238 (41.6%) |
| 38 | Showering or washing one's genital/private part after sex keeps the person from getting HIV | 273 (47.7%) | 112 (19.6%) | 187 (32.7%) |
| 39 | Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex | 228 (39.9%) | 105 (18.4%) | 239 (41.8%) |
| 40 | Taking vitamin supplementary can prevent a person from getting HIV | 321 (56.1%) | 93 (16.3%) | 158 (27.6%) |
| 41 | Eating a healthy and balanced diet can keep a person from getting HIV | 305 (53.3%) | 125 (21.9%) | 142 (24.8%) |

TABLE 2: Continued.

| No. | Question | Correct | Wrong | I don't know |
|---------------------|-------------------------------------------------------------------------------------------------------------|-------------|-------------|--------------|
| Part 4: HIV testing | | | | |
| 42 | Premarital screening helps to reduce the incidence of HIV. | 203 (35.5%) | 93 (16.3%) | 276 (48.3%) |
| 43 | Urine, X-ray, total blood count, and biochemistry analyses are used to check for the HIV virus in the blood | 102 (17.8%) | 321 (56.1%) | 149 (26.0%) |
| 44 | Anonymous HIV testing is available in all government clinics in Malaysia | 274 (47.9%) | 92 (16.1%) | 206 (36.0%) |
| 45 | HIV testings in all government clinics in Malaysia are expensive | 242 (42.3%) | 80 (14.0%) | 250 (43.7%) |
| 46 | If a person tests positive for HIV the test can tell how sick the person will become | 166 (29.0%) | 186 (32.5%) | 260 (38.5%) |
| 47 | Mandatory HIV testing is required in all prisons and rehabilitations centre in Malaysia | 193 (33.7%) | 82 (14.3%) | 297 (51.9%) |
| 48 | It is mandatory for all Muslim couples in Malaysia to be tested for HIV before marriage | 58 (10.1%) | 277 (48.4%) | 247 (41.4%) |

TABLE 3: Mean percentage scores in relation to age and ethnicity ($N = 572$).

| Parameter | N | Mean score (%) | SD | P value |
|-----------|-----|----------------|-------|-----------|
| Age | | | | |
| 15 | 158 | 62.02 | 10.92 | — |
| 16 | 103 | 63.48 | 12.09 | 0.340 |
| 17 | 195 | 66.26 | 12.51 | 0.001 |
| 18 | 94 | 65.30 | 11.64 | 0.038 |
| 19 | 22 | 72.96 | 9.74 | 0.000 |
| Ethnicity | | | | |
| Malay | 97 | 62.45 | 10.01 | — |
| Chinese | 357 | 64.88 | 12.78 | 0.085 |
| Indian | 114 | 65.19 | 12.76 | 0.042 |
| Others | 4 | 64.49 | 5.8 | 0.451 |

there were statistically significant associations between the mean percentage scores and age 17, 18, and 19 years ($P = 0.010$, $P = 0.038$, and $P = 0.000$, resp.) but not for age 16 years ($P = 0.342$). There was no association between gender ($P = 0.545$) and ethnic groups with mean percentage scores ($P > 0.05$).

4. Discussion

This study provided important insight regarding the knowledge of HIV/AIDS amongst Malaysian high-school students between the ages of 15 to 19 years. The findings from this study indicated that the level of knowledge of HIV/AIDS among Malaysian high-school students was moderate with an overall total percentage score of 64.7%. This was comparable to another Malaysian study which showed that the level of HIV/AIDS knowledge among young Malaysian adults in the age group of 15–24 years old was also moderate and with another study among students of health institutes in the conservative Islamic city of Sana'a in Yemen where the average percentage score was 67.6% [5, 6]. However, in these studies, the questionnaires used were different from the one used in this study although the subject matters were similar.

There was no significant difference in terms of knowledge of HIV/AIDS between male and female students in our study. This finding was consistent with a survey among college students in the United States which revealed that HIV/AIDS knowledge among college students did not differ based on gender [7]. However, gender differences were noted in studies done among college students in China which showed that male students were more knowledgeable than female students especially in the area of HIV/AIDS treatment and prevention [8].

In our study, the overall HIV/AIDS knowledge was lowest among the Malays (52.5%), followed by the Chinese (64.9%) and Indians (65.9%). This is in contrast to another study done among young adults in Malaysia, whereby knowledge of HIV/AIDS was highest among the Malays [3]. The results in our study may have been affected by the relatively smaller number of Malay students (Table 3) compared to other ethnic groups. Using the Malay ethnic group as the reference, there was no difference between the Malay and Chinese students ($P = 0.085$) in terms of overall knowledge of HIV/AIDS. However, there was a difference between Malay and Indian students ($P = 0.042$).

The knowledge regarding HIV/AIDS was higher in the older age groups in our study (Table 3). Although there was no difference between students aged 15 and 16 ($P = 0.340$), statistically significant differences were found with students aged 17 and above compared to students aged 15 years. This may be because older students were more exposed to sexual education and were more matured in their thinking. Sex education is not a formal subject in the Malaysian education system, but it is incorporated into the current existing subjects and curriculum like moral studies, Islamic studies, and science. The association between older students and better knowledge of HIV/AIDS in this study was consistent with other studies done in Malaysia and other countries [3, 7, 8].

In our study, the students scored the highest in Part 2 of the questionnaire (72.2%), which contained questions related to the mode of transmission of HIV. Knowledge of the different modes of HIV transmissions is important as it is relevant to the prevention of HIV infection. The relatively higher scores in this section may be the result of aggressive

government awareness campaigns and youth programs like *Program Sihat Tanpa AIDS Untuk Remaja* (PROSTAR or its English translation: The Living Without AIDS Program For Youths) which aimed to raise awareness among youths on HIV/AIDS and to decrease the mode of transmission of HIV [9].

Although the majority of the students in our study had the correct knowledge regarding the most common modes of transmission of HIV, misconceptions still existed among some of the students where many believed transmission was possible via the sharing of a toothbrush (50.2%), kissing (41.6%), sharing food and utensils (37.1%), and sharing a glass of water (36.7%). These misconceptions were not exclusive to the students in our study but were also found among Korean adolescents [10].

Our study also showed that 63.1% of the students were aware that HIV can be prevented by the use of latex condoms. The use of latex condoms during sexual intercourse can reduce a person's risk of being infected with HIV, which may lead to lower prevalence of HIV in the community. The importance of stressing on HIV prevention in the younger age groups can directly decrease the prevalence of HIV nationwide. For example, the government of Thailand strongly campaigned for promoting "100 percent condom use" in young males in the 1990s which resulted in an increased in knowledge and access regarding condom use and decrease in percentage of young men infected with HIV within 5 years [11].

In our study, the students scored the lowest (51.3%) in Part 4 which contained questions in relation to HIV testing. The relative ignorance of the students on this issue may be because the main focus of many HIV awareness campaigns and advertisements in Malaysia was on prevention of transmission of HIV rather than on the availability and the types of HIV testing. This is evident in our study where less than 50% of the students were aware that anonymous HIV testing is freely available in all government clinics in Malaysia. The role of anonymous HIV testing has been evaluated and has been recommended as part of HIV care because it was linked to early detection of the infection and access to medical care [12]. The relative lack of knowledge of these students in this area is of concern and needs to be addressed in future awareness programs.

There were several limitations in our study which may have influenced the outcome of the study. The study population was selected from four urban schools in the city of Seremban where the composition of the students was different from student compositions in, for example, rural schools, full-board schools, and single ethnic group schools. The outcome of this study therefore may not reflect the true picture of all students between the age of 15 and 19 years in Malaysia.

In addition, the distribution of the ethnic groups in our study did not reflect the true distribution of the ethnic groups in Malaysia where the Malays are the largest ethnic group (65%), followed by the Chinese (26%), the Indians (8%), and other unlisted ethnic groups (1%) [13].

The third limitation of this study was that English language was used in the questionnaire. Many students in

Malaysia are not proficient in written or spoken English and may have had difficulty in understanding and answering the questionnaire although we have attempted to minimize this by selecting only students from the top 3 classes in each age group as well as offering assistance in explaining the questionnaire at the time when the students were answering them. This selective process, however, may have influenced the outcome of this study wherein the knowledge of students with poorer command of English was not assessed. This may be remedied by using validated questionnaires in the mother tongue of the students in future studies.

5. Conclusions

Our study showed that knowledge of HIV/AIDS amongst Malaysian students between the age of 15 and 19 years was moderate. These students scored highest in questions pertaining to HIV transmission and lowest in questions pertaining to HIV testing. Older students demonstrated better level of knowledge of HIV/AIDS compared to younger students. Future awareness programs targeting these students should include emphasis on availability of HIV testing facilities.

Conflict of Interests

The authors of this paper declare no conflict of interests in submitting this paper for publication. The authors further declare this study received no funding from any organizations or persons.

Author's Contribution

Dr. K. Kwee Choy made literature search and writing of the paper, Professor Dr. R. Chandra Jutti made study design, piloting, and validation of modified questionnaire, and Dr. A. Lai, Dr. J. Lee, Dr. M. Sabapathy, and Dr. O. Jue Jing made study design, data collating and data entry, statistical analysis, and literature search.

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