

Research article

HIV/AIDS-Related Knowledge Among Malaysian Young Adults: Findings From a Nationwide Survey

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Abstract

Purpose: HIV/AIDS poses a serious threat to young people, both in Malaysia and throughout the world. A nationwide cross-sectional survey was conducted to assess the knowledge, attitudes, and beliefs about HIV/AIDS among the Malaysian public. This article reports the findings of knowledge about HIV/AIDS among young adults.

Methods: A total of 1075 young adult respondents aged 15-24 years participated in this survey. The response rate was 82.2%.

Results: The data indicated that HIV/AIDS knowledge among the respondents was moderate, with a mean knowledge score of 20.1 out of 32 points. The great majority had adequate knowledge of the major routes of HIV transmission, but fewer were aware of other modes of transmission, such as tattooing and piercing, sharing personal items, and breast-feeding from an infected mother. The great majority knew that HIV is not transmitted by mosquito bites, sharing meals, casual contact, and using public swimming pools and toilets.

Conclusion: Misconceptions about HIV/AIDS exist although generally knowledge on HIV/AIDS transmission and prevention was accurate. Education and intervention programs are needed to increase the level of knowledge and awareness of HIV/AIDS. The findings have important implications for the development of primary HIV/AIDS prevention programs for young adults in Malaysia.

Introduction

Globally, young people aged 15-24 years account for about 40% of new HIV infections,[1] and this is true in Malaysia, where HIV infections occur primarily among young people. The trend among adolescents and young adults towards high-risk behavior coupled with insufficient education are the primary reasons for the increase in transmission of HIV.[1,2] A worrisome aspect of this epidemic is that HIV/AIDS affects Malaysians in their prime productive years. Malaysia's young people are assets in the devel-

opment of the country, and this epidemic results in a drain on human resources in this most economically-productive portion of the population.[3]

The HIV/AIDS epidemic in Malaysia has emerged as an important health problem since the first HIV case was detected in 1986.[4] Since then, according to the Malaysian AIDS Council Resource Center, the cumulative number of HIV infections up to June 2007 amounted to a total of 78,784.[5] Particularly alarming is the fact that the

HIV infection rate and AIDS cases are showing a rapid increase among young people. In young people aged less than 30 years, there were 20,330 HIV infections and 1818 AIDS cases recorded in 2002. In 2005, the number increased to 26,810 and 2546, respectively. Up to June 2007, a total of 29,269 HIV infections and 2974 AIDS cases were reported in Malaysians below the age of 30 years.[5]

Malaysia is a moderate Islamic country with the majority of Muslim Malays and other ethnicities (Chinese and Indian) living together with the freedom to practice their religion and observe other cultural practices. Like many Islamic societies, issues dealing with sex and sexually transmitted infections (STIs) are seen as taboo and sensitive, and therefore are not discussed openly.[6-8] Despite the domination of conservative and traditional values in Malaysia, adolescents date and many engage in unsafe sexual intercourse.[9] The incidence of adolescents engaging in sexual intercourse also increases with age.[10,11] What is more alarming is that most sexual encounters are unsafe, with no protection against STI and unwanted pregnancy.[12] There is no doubt that young people are at greater risk of acquiring STIs, particularly HIV/AIDS, than other age groups.

With no specific cure for HIV/AIDS, preventive measures based on information and education programs remain crucial for tackling HIV/AIDS and its associated problems.[13] Thus, communication and intervention strategies play important roles in educating the public, especially the young adult, on the prevention and control of HIV/AIDS. Previous studies on HIV/AIDS issues were done based on purposive sampling of populations such as drug users, healthcare workers, and adolescents[14-16] and results cannot be generalized to the population as a whole. Few published studies are available on the knowledge, attitudes, and beliefs about HIV/AIDS among the general population in Malaysia.

A nationwide survey was conducted for the Ministry of Health Malaysia to assess HIV/AIDS-related knowledge, attitudes, beliefs, and practices among the population aged 15-49 years. The purpose of this survey was to lay down a baseline measurement to help design education and intervention strategies related to HIV/AIDS that would educate the public, raise awareness, and ultimately decrease the incidence of risk-related behaviors associated with the spread of HIV. This article reports on the findings among young respondents aged 15-24 years.

Methods

The Nationwide Survey on HIV/AIDS Knowledge, Attitudes and Risk Behavior was conducted in 2006 for the Health Education Division, Ministry of Health (MOH)

Malaysia by the University of Malaya. The main objective of the survey was to assess the knowledge, attitudes, and risk behaviors related to HIV/AIDS among people aged 15 to 49 years. The data collection was carried out between the months of June and July 2006.

Study Design

A cross-sectional design was used in the survey. Respondents were interviewed face-to-face using a structured questionnaire, and questions on risk behavior were self-administered.

Sample Selection

Multistage random sampling design with probability proportional to size was used in the survey. The studies were conducted in 4 states from Peninsular Malaysia and both states in East Malaysia. The 4 states from Peninsular Malaysia were randomly selected by dividing the peninsula into 4 zones: North, South, East and West. In each zone, a state was randomly chosen. Then a district was randomly selected from the 6 selected states (Figure 1). A district is geopolitically divided into several *mukims* or sections. Therefore, a *mukim* was randomly selected from a chosen district. Finally, an urban and a rural area were selected randomly from a *mukim*. At the household level, stratified random selection based on major ethnicity (Malay, Chinese, and Indian; ratio of 5:4:1, respectively) and sex (male to female ratio of 1.03) was carried out. Households were selected randomly from the areas chosen in a *mukim*. If a household had more than 1 eligible



Figure 1
The selected 6 districts where data were collected.

respondent, only two of them from different age generations were selected. Based on census data,[17] the total population aged 1549 years in Malaysia was 12,536,500. The calculated sample size was 2017, using the 95% confidence interval, 80% power, and 0.02 error margins. However, considering the possibility of questionnaires being rejected due to incompleteness and nonresponse from participants, the sample size was increased by an additional 20%, giving a total sample size of 2420.

Ethical Considerations

The study was conducted after approval had been obtained from the Medical Ethics Committee, University Malaya Medical Center, Kuala Lumpur, Malaysia. All participants were informed of the objective of the study and verbal consents were received from the respondents for interview.

Questionnaire

The questionnaire was developed based on a literature review of other similar surveys in the region as well as globally and was reviewed and validated by a panel from the Ministry of Health. The questionnaires were made available in 4 languages (Bahasa Malaysia, English, Mandarin, and Tamil) and were pilot tested and revised before the survey.

Knowledge of HIV/AIDS consisted of: (1) several aspects of general HIV/AIDS knowledge (7 questions), (2) modes of HIV infection (14 questions), (3) prevention of HIV infection (6 questions), and (4) HIV testing (5 questions). Responses were scored 1 if correct and 0 if incorrect or unanswered. The overall knowledge score was calculated by adding the scores from each of the 4 sections of the test. Possible overall knowledge scores ranged from 0 to 32.

The knowledge of availability of HIV/AIDS-related health services in the country was also queried, whereby respondents were asked where to seek HIV/AIDS related testing, treatment, and counseling or advice.

Data Analysis

Statistical Package of Social Science (SPSS Inc.; Chicago, Illinois) version 13.0 was used for data management and analyses. Descriptive statistics including frequencies, means, medians, and standard deviations were performed to give general descriptions of the data. T-test and ANOVA were performed to examine differences in knowledge scores and demographic variables. The level for statistical significance was set at $P < .05$. Only significant results were discussed.

Results

The overall response rate of this survey was 82.2%. The total number of respondents who completed the survey

questionnaire was 2604, with 1075 respondents aged 1524 years.

Characteristics of Respondents

Of the 1075 young respondents in the sample, about half were aged 1519 years (Table 1); the mean age was 19.4 years ($SD \pm 2.8$). A majority of the respondents reported that they were currently working and almost half were still attending school. About three quarters of the respondents reported secondary school as their highest education level. Only about 12% of the respondents were married. The male to female ratio was 1.34, which was somewhat higher than the male to female ratio of 1.03 in the general Malaysian population. A substantial percentage of the respondents fell in the low and lower-middle income categories, with incomes below 550 US dollars (USD) per month.

Knowledge of HIV/AIDS

General HIV/AIDS knowledge

The survey found that 4.3% of respondents ($n = 46$) had never heard of HIV/AIDS; most of these individuals ($n = 30$) were from rural areas and nearly half of these ($n = 16$) were students. Of those that had heard of HIV/AIDS ($n = 1029$), when further asked to define HIV and AIDS, many (64.9%, $n = 668$) were unable to correctly differentiate HIV from AIDS. Misconceptions were still noted relating to HIV/AIDS, with 13.9% ($n = 143$) having no idea whether HIV-positive people could be recognized by their appearance and 28.7% ($n = 295$) believing that HIV-positive people could be so recognized. Surprisingly, 18.1% ($n = 186$) believed that there was a cure for AIDS, and only 69.8% ($n = 718$) reported that HIV/AIDS could not be cured. Only 50.6% ($n = 521$) believed early detection could prolong life. The majority (82.9%, $n = 853$) knew about blood-based HIV testing; however, 17.1% ($n = 176$) had no knowledge about how a person could be tested for HIV. Many (80.5%, $n = 828$) had never heard of anonymous HIV testing, which has been made available in the country.

The mean ($\pm SD$) and median of the total correct general HIV/AIDS knowledge scores of all respondents on a 7-item test were 4.6 ± 1.4 and 5.0, respectively. The mean total score among respondents from Peninsular Malaysia (4.8 ± 1.4) was higher than the score among respondents from East Malaysia (4.2 ± 1.5 , $P < .001$). Female respondents had a significantly ($P < .01$) higher total mean score (4.7 ± 1.4) than male respondents (4.5 ± 1.5). Statistically significant differences were noted among the ethnic groups (4.8 ± 1.3 , $P < .001$), with the Malays having the highest score. Older respondents had significantly higher scores than younger respondents (4.7 ± 1.3 among those aged 2024-years vs 4.4 ± 1.5 among those aged 1519-years, $P < .001$). Urban respondents had a significantly (P

Table 1: Sociodemographic Characteristics (N = 1075)

Characteristics	Number of Respondents	%
Age		
1519 years	549	51.1
2024 years	526	48.9
Sex		
Male	616	57.3
Female	459	42.7
Ethnicity		
Malay	384	35.7
Chinese	306	28.5
Indian	74	6.9
Others	311	28.9
Religion		
Islam	495	46.0
Buddhism	294	27.3
Christian	213	19.8
Hindu	66	6.1
Others	7	0.8
Highest Educational Level		
No formal schooling	13	1.2
Primary school	52	4.8
Secondary school	808	75.2
College/University	202	18.8
Currently student		
Yes	494	46.0
No	581	54.0
Average household income per month*		
less than RM1000	580	54.0
RM1000 RM2000	337	32.3

Table 1: Sociodemographic Characteristics (N = 1075) (Continued)

RM2001 RM3000	87	8.1
RM3001 RM4000	29	2.7
RM4001 RM5000	14	1.3
above RM5000	28	2.6
Marital Status		
Not married	946	88.0
Married	128	11.9
Divorced/Widowed	1	0.1
Locality		
Urban	514	47.8
Rural	561	52.2
Total	1075	100.0

RM = Ringgit Malaysia.
 *1 US dollar = RM3.6

< .05) higher mean total score (4.7 ± 1.3) than rural respondents (4.5 ± 1.5).

Knowledge of modes of transmission

Table 2 shows that, on questions about mode of transmission, most of the respondents knew that HIV is transmitted via sharing injecting needles with an infected person (94.8%), having sexual intercourse with an infected person (93.7%), receiving a transfusion of infected blood or receiving an organ from an infected person (91.9%), having sex with multiple sexual partners with unknown HIV status (91.4%), and from an infected mother to her fetus (85.6%). Most were also aware that HIV infection is not transmitted by casual contacts (90.8%), sitting on public toilets (90.5%), and using a public swimming pool (89.7%). However, a smaller majority were aware of other modes of transmission, such as tattooing and piercing (63.3%), sharing personal items (60.8%), and breast-feeding from an infected mother (54.8%). Transmission via breast-feeding was the mode of transmission about which the highest percentage of respondents (28%) was "unsure."

The mean (\pm SD) and median of the total scores on mode of transmission on a 14-item test were 9.7 ± 2.2 and 10.0, respectively. Female respondents had a higher mean total score (10.0 ± 2.2) than male respondents (9.6 ± 2.3) ($P < .01$). The mean total score was 10.0 ± 2.1 for the older age

group (2024 years) and (9.5 ± 2.3) for the younger age group (1519 years) ($P < .001$). There were significant differences in the scores among people of different ethnicities (10.2 ± 2.0 , $P < .001$), with the Malays having the highest score, followed by the Chinese and Indians.

Knowledge of HIV prevention

In response to the question asking whether HIV infection could be prevented, 79.1% of the respondents believed that it could. As shown in Table 3, the most well-known modes of prevention were: (1) to avoid taking drugs, (2) to not share injecting needles and syringes, and (3) to have sex with only one faithful uninfected partner. Only 79.5% of the study population knew that HIV/AIDS could be prevented by using condoms. Some misconceptions were noted, with 41.9% of respondents believing incorrectly that washing the genital area with soap after sexual intercourse could prevent HIV infection and 36.1% believing that avoiding touching HIV positive people could do so, thus indicating an inadequate awareness about the prevention of HIV/AIDS in our study subjects.

On the whole, the mean (\pm SD) and median of the total scores on HIV prevention on a 6-item test were 4.3 ± 1.2 and 4.0, respectively. The mean total score was 4.5 ± 1.2 for the older age group (2024 years) and 4.2 ± 1.2 for the younger age group (1519 years) ($P < .01$). There were significant differences in the scores among different ethnicities (4.5 ± 1.1 , $P < .05$), with the Malays having the highest score. Rural respondents had a significantly higher average mean score than urban respondents (4.4 ± 1.1 vs 4.2 ± 1.2 , $P < .05$).

Knowledge of HIV testing

It is interesting to note that the majority of the respondents were aware that blood tests (94.7%), DNA tests (68.3%), and urine tests (63.0%) can all be used for detecting HIV infection, but that only 35.1% of the respondents knew that an oral fluid test can also be used for testing.

On the whole, the mean (SD) and median of the total overall knowledge scores (calculated by adding the scores from each section of the test) were 20.1 (SD = 6.0) and 21, respectively, out of a total of 32 points. Significant differences were observed between female and male scores (20.6 [SD = 5.7] vs 19.7 [SD = 6.1], $P < .05$). Significantly higher scores were also shown for older respondents compared with the younger respondents (20.9 [SD = 5.2] for the older group vs 19.3 [SD = 6.5] for the younger group, $P < .001$).

The ANOVA showed that the mean total overall knowledge score was significantly correlated with average household income ($F = 2.65$, $df = 5$, $P < .05$). As shown in Figure 2, those from households with higher incomes

were significantly more knowledgeable. Significant differences were also found between respondents from different educational levels ($F = 20.45$, $df = 3$, $P < .001$). The higher the educational level, the higher the mean score obtained by the respondents. Differences in mean total score were also observed among the ethnicities, with Malays obtaining the highest mean total score ($F = 9.201$, $df = 3$, $P < .001$).

Knowledge on the availability of healthcare services

Respondents were also queried on their knowledge of the availability of HIV/AIDS-related health services (HIV/AIDS testing, HIV-related counseling, and treatment for HIV/AIDS). When asked about where a person could obtain HIV/AIDS-related health services, the overwhelming majority noted that they could obtain HIV testing (94.6%), HIV-related counseling (91.2%), and treatment (93.8%) from government hospitals. This shows that the majority recognized that government health facilities offer HIV/AIDS-related services. In addition to government hospitals, a small minority of respondents thought that the services were also available at private hospitals and clinics in the country. Surprisingly, some respondents thought that traditional or folk healers could also provide such services (HIV testing [4.5%], HIV counseling [7.0%], HIV treatment [6.9%]).

Sources of HIV/AIDS Information

The respondents obtained HIV/AIDS-related information from various sources. Television (95.6%) was by far their primary source, followed by newspaper (86.1%), radio (76.6%), and printed material from the Ministry of Health Malaysia (51.6%). Nearly 40% reported having received HIV/AIDS-related information from friends and family, and one-third (33.8%) of the respondents obtained HIV/AIDS-related information from the Internet. Only 23.3% ($n = 397$) of the respondents mentioned PROSTAR (the Healthy Adolescents Without AIDS program) as a source of information about HIV/AIDS.

Discussion

Our results provided baseline data on the knowledge, attitudes, and beliefs about HIV/AIDS among the young adults in Malaysia. The level of general HIV/AIDS knowledge among young Malaysian adults was moderate, as indicated by a total mean score of general HIV/AIDS knowledge of 4.6 out of 7 points. The findings indicated that a majority of the respondents were aware of HIV/AIDS. However, there is a need for improvement as a considerable percentage incorrectly believed that persons living with HIV can be recognized by appearance and that there is a cure for AIDS. Those who are unaware that an HIV-infected person may be asymptomatic are more at risk because they are unaware that they could be infected by an apparently healthy partner.[18] Likewise, misinformation concerning a cure for HIV/AIDS should be cor-

Table 2: Correct Answers on Modes of Transmission

Modes of Transmission	Correct Answer	Number of Respondents (% Correct Answer)
Sharing needles with HIV-infected person	Yes	975 (94.8)
Having sexual intercourse with HIV-infected person	Yes	964 (93.7)
Transfusion of HIV-infected blood or receiving HIV-infected organ	Yes	945 (91.9)
Having sex with multiple sexual partners with unknown HIV status	Yes	940 (91.4)
From an HIV-positive mother to her fetus	Yes	880 (85.6)
Sharing personal items such as shaving blades	Yes	620 (60.3)
Breast-feeding from an HIV-infected mother	Yes	564 (54.8)
Mosquito bites	No	484 (47.0)
Kissing an HIV-infected person	No	629 (61.1)
Having tattoo or body piercing	Yes	651 (63.3)
Sharing a meal with an HIV-infected person	No	717 (69.7)
Using a public swimming pool	No	923 (89.7)
Sitting on a public toilet	No	931 (90.5)
Casual contacts (hugging or touching) with an HIV-infected person	No	934 (90.8)

rected as this misconception is also another risk factor for contracting the disease. We also found that nearly half of the respondents did not believe that early detection could prolong life, and the majority had never heard of anonymous HIV testing. These findings are comparable to studies done elsewhere in Asia.[6,19,20]

The data in this study revealed a significant gender difference in general HIV/AIDS knowledge, with females being more knowledgeable than males. Gender differences in

AIDS knowledge have been found in other studies[21,22];however, a study among college students in China, found males to be more knowledgeable than females.[23] General HIV/AIDS knowledge also appeared to vary with other demographic characteristics, with the highest knowledge among the Malays, those from urban areas, and the older age group. This finding is consistent with studies in other countries[23,24] and may reflect differences in the level of HIV/AIDS education. Educational efforts need to be targeted at those who are most misin-

Table 3: Correct Responses on the Prevention of HIV

Prevention	Correct Answer	Number of Respondents (% Correct Answer)
Avoid taking drugs	Yes	737 (90.5)
Do not share needles and syringes	Yes	732 (89.9)
Having sex with only one faithful, uninfected partner	Yes	692 (85.0)
Use condom during sexual intercourse	Yes	647 (79.5)
Wash genital area with soap after sexual intercourse	No	473 (58.1)
Avoid touching HIV-positive people	No	520 (63.9)

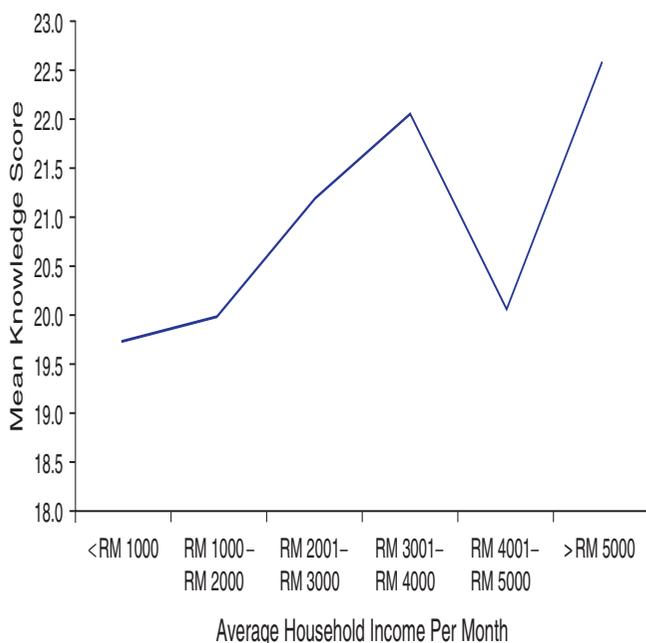


Figure 2
Relationship between mean total overall HIV/AIDS knowledge score and average household income.

formed to meet the needs of different populations: (1) particular age groups, (2) those in different geographical locations, and (3) different ethnic groups.

Despite the fact that anonymous HIV testing has been made available to the public, many have not heard of it. People are more likely to be voluntarily tested for HIV if the testing is anonymous; for example, a study reported an increase in the demand for HIV testing once the option of anonymous testing was provided,[25] and this may even contribute to early HIV medical care.[26] Hence, the availability of anonymous HIV testing needs to be emphasized in the information and education programs directed at people who are seeking testing.

Consistent with findings in the other Asian countries[23,27] and the United States,[28,29] the majority of young people appeared to rely on the public media (television, newspapers, and radio) as their primary source of HIV/AIDS information. Our findings suggest that future education campaigns on HIV/AIDS would best be conducted via mass media (specifically television, newspapers, and radio). There is overwhelming evidence for the effectiveness of mass media in raising awareness and increasing knowledge in developing countries.[30] The findings of this study are also consistent with other studies[31] that found that relatively high percentages of young people did not receive information from family members and medical professionals. Since the majority of

respondents identified mass media as their main source of information, it may be one of the most effective channels for the delivery of HIV/AIDS-related information and education efforts.

Although it has been reported that the Ministry of Health's PROSTAR program (Healthy Living without AIDS for Youth) significantly increased the level of awareness among the club members,[32] our survey indicated the majority of young people were not members of PROSTAR and many had never heard of it. PROSTAR should attempt to reach more young people, especially from rural or hard-to-reach groups to create a future generation of well-informed youth in relation to HIV/AIDS.

It was observed in this study that although the large majority of the study population had correct knowledge of the most common modes of transmission, such as sharing injecting needles and sexual transmission, misconceptions were still held regarding nonsexual routes of transmission. Belief that HIV could be transmitted by mosquito bites, sharing meals, casual contact, and using public swimming pools and toilets still appeared prevalent. Mirroring a local study[33] conducted in 1991, this study showed that the majority of the adolescents interviewed were aware that HIV transmission resulted primarily from high-risk behaviors, such as having unprotected sex and sharing needles. For these reasons, efforts should be made to provide accurate information and address misconceptions about HIV transmission. The erroneous belief that mosquitoes are vectors for HIV is a quite common misconception, as has been shown in many other studies.[34-38] The proportion of respondents that were aware that HIV/AIDS is not transmitted by mosquito bites in our study (47.0%) was similar to the results from studies conducted among Asian-Indian adolescents (48.0%)[35] and Turkish adolescents (40.3%).[36] Casual contact and sharing meals were also more likely to be cited as a way to transmit HIV by those who had less awareness of the disease, and by those who held more stigmatizing views toward those living with HIV/AIDS. Many were also unaware that HIV transmission could occur from getting a tattoo or through body piercing.

In general, knowledge about HIV prevention was high among the respondents. Nevertheless, a significant number of respondents had misconceptions about HIV prevention methods, in particular the beliefs that washing the genital area with soap after sexual intercourse and avoiding touching people living with HIV could prevent infection. The knowledge of HIV/AIDS prevention in this study appeared slightly higher among the rural respondents than among urban respondents. Our findings differ from those of other studies that found the highest knowledge levels among students from urban areas and the low-

est levels among those from rural areas.[23,24] Nevertheless, this may reflect differences in the level of HIV/AIDS education or information access in different regions; HIV/AIDS education should therefore target the underserved regions.

Although the knowledge of HIV prevention methods is good, it is important to know whether the young people are equipped with the necessary life skills to reduce their vulnerability to HIV infection, such as the ability to negotiate condom use. Elsewhere, many young people do not have the basic knowledge and skills to prevent themselves from becoming infected with HIV.[39] Having access to HIV/AIDS information is not sufficient; young people, especially adolescents, need to be guided and taught to incorporate this knowledge into daily life.[40]

The results of our study showed that an overwhelming majority of the respondents knew where to seek healthcare services related to HIV/AIDS. However, further study needs to be carried out to ascertain whether young people have access to the healthcare services provided in all government hospitals and clinics. Reports have shown that in many developing countries, young peoples' access to STI and HIV/AIDS healthcare services was insufficient and remained low compared with that of the adult population.[41,42] Nevertheless, knowing where to obtain STI and HIV/AIDS healthcare services is clearly an essential first step towards prevention and protection against HIV infection.

Conclusion

The findings served to illuminate important points about the knowledge of young Malaysians regarding HIV/AIDS. There are significant gaps in their knowledge about HIV/AIDS prevention and transmission along with some misconceptions. Such inadequate knowledge may place young Malaysians at risk for HIV infection. The data from this survey could be a useful guide in the development of campaigns or programs designed to convey accurate information about HIV transmission routes and prevention strategies and to dispel erroneous beliefs about HIV. A media campaign to increase knowledge and change the attitudes of Malaysian youth is imperative, with specific emphasis on the most disadvantaged and neglected segments of the population.

Authors and Disclosures

L.P. Wong MSc, PhD, has disclosed no relevant financial relationships.

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