

Knowledge, Attitudes and Beliefs Related to HIV/AIDS Among Adolescents in Malaysia

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Summary

Findings on knowledge, attitudes and beliefs related to HIV/AIDS among 520 Malaysian adolescents, aged 15 to 21 years, based on a survey conducted in Peninsular Malaysia showed that the average score for knowledge on HIV/AIDS was high, and majority showed a positive attitude towards the disease. However, misconceptions regarding transmission and gender bias related to sexual behaviour and contracting the disease prevailed. Although 72 percent of the sexually-experienced did not use protection at first sexual intercourse, 80 percent did not perceive themselves to be at risk of contracting HIV/AIDS. A critical review of existing HIV/AIDS prevention programmes to focus on adolescent risk-taking behaviour and sexuality issues, including male-female negotiation skills, is warranted.

Key Words: Adolescents, Knowledge, Attitudes and beliefs on HIV/AIDS, HIV/AIDS prevention, Behaviour change

Introduction

Since the human immunodeficiency virus (HIV) emerged as a health problem, an estimated 30 million people have become infected and six million have died from AIDS¹. Among all new HIV infections in the world, more than half - numbering over 7,000 each day - are among young people aged 10 to 24 years².

In Malaysia, the trends in HIV/AIDS show that the numbers have increased dramatically since first cases were identified in 1986 (Figure 1). In 1999, the cumulative total was 33, 233 HIV+ and 3,554 AIDS cases. Ninety-four percent of these were men and six percent were women. The upward trend for women is noticeable since 1995 and this is worrisome. Forty-two percent of the HIV+ cases were below 29 years of age and 30 per cent of

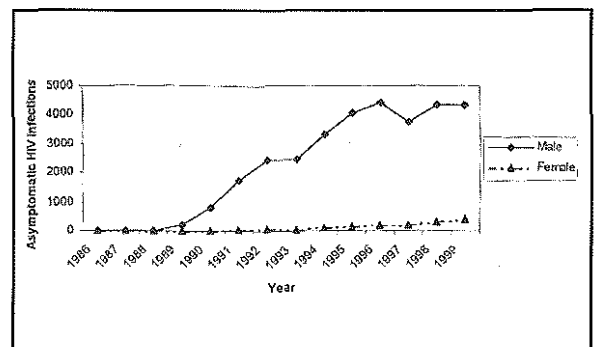


Fig. 1: Trends in new HIV infections reported in Malaysia.

AIDS cases were found within this cohort. Although only a small proportion (4 per cent) of known AIDS cases were adolescents (13 - 19

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years), 22 percent of them were between 20 - 29 years - see Table I. This latter group may have first contracted HIV during their teens, given the possibly lengthy period between viral infection and appearance of disease symptoms.

With regards to transmission mode, the majority of reported Malaysian HIV+ and AIDS cases were intravenous drug users, contracted via sharing of infected needles. This predominance of drug-related transmission in the Malaysian data is because of mandatory testing of drug users who voluntarily go for treatment, or who are arrested by the police. Furthermore, a high prevalence of high-risk sexual behaviours, such as unprotected casual and commercial sex, have been reported among intravenous drug users in Malaysia³. Hence, the actual mode of transmission among this group of intravenous drug users is not clear. Indeed, the mode of sexual transmissions can be surmised to be serious and significant since the Ministry of Health data showed that the Heterosexual category had the second highest proportion of HIV+ and AIDS cases, following after the intravenous drug user category - see Table I. Emerging concerns with the latest social phenomenon of "idling behaviour" (*"berlepak"*) among Malaysian teens and youths that is often associated with sexual promiscuity underscores the issue of high-risk sexual behaviour as a critical mode of HIV/AIDS transmission. In 1994, a study on the idling behaviour of 6,110 Malaysian adolescents from rural and urban areas showed that 18 percent of them ever had sex before, with 75 percent of them aged between 16 - 21 years. In another study on secondary school students aged 13 - 17 years, 5 percent of them reported they had had sex and 2 percent of them had taken drugs⁴. Undoubtedly, this combination of high-risk sexual and drug-taking behaviours among specific groups of Malaysian adolescents is potentially explosive with regards to HIV/AIDS transmission and infection.

In terms of programmes, the Ministry of Health Malaysia began monitoring and surveillance since 1985 of the numbers afflicted by instituting

mandatory reporting under the Prevention and Control of Infectious Diseases Act (1988). Screening of blood donors was made mandatory by 1986. In 1988, as part of a strategy to prevent and control the spread of AIDS, a media blitz in all the major languages was organised to educate the public. For instance, since 1993, the Ministry of Health has aired over TV and radio a total of 10 different types of trailers on AIDS in four local languages. Several non-Government organisations (NGOs) also were founded with focus on case management, outreach, prevention and/or fund-raising efforts. In 1993, the Ministry of Health set up a National Council of Non-Government Organisations on AIDS to co-ordinate funding and activities in support of the Government programme. The Ministry of Health, National Family & Population Development Board, and the Federation of Family Planning Associations have begun several programmes and pilot projects on information and services/clinics for adolescents. Specifically, the PROSTAR programme initiated by the Ministry of Health is aimed at enabling Malaysian adolescents to address social ills, such as, sexual promiscuity, drug addiction, juvenile delinquency and idling behaviours as well as the HIV/AIDS epidemic. Designed as a peer programme run by adolescents for adolescents, it focuses on changing attitudes and behaviours towards a healthy life without AIDS⁵. In 1995, a Malaysian AIDS Charter was launched by the Minister of Health, a document formulated by nearly 80 government and NGO agencies involved in AIDS-related activities, in consultation with people with HIV/AIDS, representatives from various groups, including religious leaders and sex workers. This Charter explicitly states the rights and responsibilities of individuals, organisations and government bodies pertaining to AIDS, and addresses significant issues such as testing, confidentiality and access to information and education. It has been reported that the Malaysian government spends USD131,579 (RM500,000) a year for treating each AIDS victim; and about USD32 million (RM120 million) had been spent for the prevention and control of HIV/AIDS programs in the country from 1993 to 1995^{5,6}.

Based on the high risk of HIV infection faced by young people world wide, the rising numbers of infections in Malaysia and the resources channeled to prevention programmes, information on the knowledge and attitudes of the local population is important for prevention and intervention. Towards this end, a nation-wide survey was undertaken on Knowledge, Attitudes and Practices related to HIV/AIDS in Malaysia. This paper describes findings on knowledge and attitudes related to HIV/AIDS among Malaysian youths from this survey.

Materials and Methods

The Malaysian Health and Lifestyle Survey was conducted in 1991 for the Ministry of Health (MOH) by University of Malaya (Social Obstetrics and Gynaecology, Faculty of Medicine), and DKT Consultants (Malaysia), a non-profit organisation, with technical and financial assistance from the World Health Organisation (WHO). DKT Consultants (Malaysia) is a local affiliate of DKT (D.K. Tyagi) International, a US non-profit organisation, carrying out social marketing projects on reproductive health and HIV/AIDS prevention world wide. The Survey was focused on knowledge, attitudes and practices related to HIV/AIDS among specific target groups of respondents in Malaysia. The general objectives of the Survey were, first, to provide baseline data on knowledge, attitudes and practices related to AIDS and STDs (sexually transmitted diseases) for future evaluation by the Ministry of Health AIDS prevention and education programmes; and secondly, to provide formative data to assist the MOH in the design and implementation of AIDS education campaigns, and to identify strengths and weaknesses for future education programmes.

The survey locations were primarily urban areas, reflecting the distribution of known HIV cases in the country at that time. Specific sites were purposively selected to cover all regions in the country and comprised Johor Baru, Kuala Lumpur and its suburbs, Ipoh, Penang, Alor Setar,

Kota Baru, Kuching and Kota Kinabalu (major urban centres), and one rural setting each in Kedah and Kelantan.

Data were gathered by a combination of face-to-face interview and self-administered (for the sexual practices and STD sections) questionnaire. The questionnaire was designed with the assistance of a consultant from the World Health Organisation and was based partially on a questionnaire developed by WHO⁷. These were modified to suit the local context with particular attention given to culturally appropriate wording. A list of four statements on sexual attitudes was obtained from the questionnaire used in a survey on Knowledge, Attitudes, Behaviour and Practices undertaken in Singapore⁸. Questionnaires were made available in three languages (Bahasa Malaysia, English and Mandarin), and pre-tested and revised before the survey. Pre-testing was carried out in one location on respondents in all three languages, covering the sex and age-range of the target groups. The questionnaire covered (i) socio-demographic background; (ii) lifestyle and media habits; (iii) knowledge and attitudes to HIV/AIDS; (iv) knowledge and attitudes to condoms; (v) attitudes towards sexual practices; (vi) sexual practices; and (vii) sexually transmitted diseases (STD). The sexual practices and STD components were only administered to those respondents who had reported experience with sexual intercourse, i.e., a 'yes' response to the opening question "Have you ever had sexual intercourse (vaginal, oral, anal sex with a male or female)?"

All interviewers were trained by the principal researcher at the Faculty of Medicine, University of Malaya, and included the purpose of the survey, method of introduction, eliciting informed consent, method of asking questions, coding and checking questionnaires and recording response rate. Interviewers were aged between 19 to 38 years of age. Although an attempt was made to match the gender of the interviewer and respondent, this was not always

possible under field conditions. Interviewers worked in teams of four, including one who was a supervisor. As Malaysia is a multi-racial multi-lingual country, it was ensured that all interviewers were fluent in the National language (Bahasa Malaysia) and in English, a language that is widely spoken in urban areas. Each team also had at least one interviewer who could speak Mandarin or Cantonese (a common Chinese dialect), and Tamil.

Survey respondents were recruited according to the following target groups: general public adults 25 - 60 yrs (n=760); general public youth aged 17 - 24 years (n=540); secondary school children aged 16 - 17 in Years 10 (Secondary Four) and 11 (Secondary Five (n=247) of school; commercial sex workers, including transvestite sex workers (n=223); high-risk men (entertainment outlet patrons, armed forces men, transport workers); and intravenous drug users (IVDUs) (n=173). In total, information from 2,131 respondents were collected. All respondents, except for the secondary school sub-sample, were selected systematically (every fifth or 10th person depending on targeted numbers of respondents) from purposively selected locations at each site. Secondary school respondents were recruited from a systematic selection of schools from school listings by survey location. With permission from the Ministry of Education and each School Principal, the eligible classes scheduled to have Physical Education on the day(s) the research team visited were allowed to participate in the survey. To all respondents, the purpose of the survey was explained carefully and questionnaires were kept confidential to encourage frank responses. It was also stressed to the respondents that participation was voluntary, and that they should skip any questions that they were particularly not comfortable answering rather than provide false responses.

Youths were recruited through the above-mentioned two sources in order to capture a wider cross-section of young people. In Malaysia, although school enrolment is almost universal, a

considerable proportion drops out after Secondary Three (ninth year of school around 15 years of age) and, even more, after Secondary Five (11th year of school) after national level examinations at those grades. The latter national examination confers the Malaysian Certificate of Education (equivalent to O-levels in the UK-based education system or high school diploma in the US system) which represents a minimum qualification for most skilled jobs, and entrance to higher education. Youths still in school and those who have left have been shown to differ in sexual attitudes and practices, i.e., in areas relevant to the Survey⁹.

For this paper, data on respondents aged 15 - 21 years from among the general public youth and the secondary school sub-samples were combined. Among this group, the overall response rate was about 77.5%. Statistical significance of differences between groups for categorical variables was tested using the chi-square statistic or Fisher's exact test for cross-tabulations with small expected cell frequencies ($n \leq 5$). Differences between groups in knowledge and attitudes scores were tested using t-test for two groups and analysis of variance for multiple groups. The non-parametric Wilcoxon Rank-Sum and Spearman's Rank Correlations were also applied to test for significance of differences between group medians. Logistic regression analysis was applied to assess selected determinants of perception of self-risk to HIV/AIDS. Goodness of fit tests were also run on each model.

Results

The results from the descriptive analysis are provided below.

Background of respondents

There were slightly more males (51%) than females (49%) among the survey respondents analysed for this paper (Table I).

Table I
Background Characteristics of Respondents
(N=520)

Characteristic	n ¹	%
Sex		
Male	263	50.67
Female	256	49.33
Age-group		
≤ 19 years	330	63.46
> 19 years	190	36.54
Race		
Malay	272	52.31
Chinese	142	27.31
Others	106	20.38
Religion		
Muslim	291	56.07
Buddhist	106	20.42
Christian	73	14.07
Others	49	9.44
Education (years of school)		
≤ 11 years	458	89.80
> 11 years	52	10.20
Employment		
Not employed	430	82.69
Employed	90	17.31
Location/Residence		
Urban	449	86.35
Rural	71	13.65
Marital Status		
Single/never married	505	98.83
Married/separated/divorced	6	1.17
Sub-sample ²		
General public	275	52.88
School-based	245	47.12
Sexual Experience ³		
Yes	64	13.28
No	418	86.72

¹ N = 520. Subtotal (n) may be less than 520 due to missing data.

² General public sub-sample: Respondents systematically recruited from purposively selected public areas in survey locations;

School-based sub-sample: Recruited from systematically selected secondary schools in survey locations.

³ Response to question "Have you ever had sexual intercourse (vaginal, oral, anal) with a male or female?"

By age group, the majority were below 19 years (Table I), with a mean age of 18.79 years (sd 1.55). The breakdown by race shows a majority of Malays (52%), followed by Chinese (27%), and Indian and others (20%). These were the major ethnic groups in the country. For comparison, the national distribution by race for Malaysia were as follows: 60.45% *Bumiputera* (primarily Malays with a small percentage of indigenous groups), 28.28% Chinese, 11.27% Indian and others¹⁰. The urban population of Malaysia has a higher proportion of non-Malays, i.e., more Malays are rural residents. Hence, it was expected that the urban sample in the present survey shows a smaller proportion of Malays among the respondents compared to the national figures. By religion, the respondents analysed for this paper were mostly Muslims, followed by Buddhist/Taoist, and others (primarily Christian and Hindu).

Since school enrolment is quite high in Malaysia, particularly in urban areas, and most of the sub-sample was recruited through secondary schools, the large majority (90%) of these respondents have secondary school level education (Table I). Based on their educational attainment, they were then categorised into two groups representing those who have attained up to Secondary Five level (11th year of school), and those with Secondary Six (12th year of school) and higher, i.e., college or university.

By employment status, most of the respondents were not working (majority being students) while 17% of them had jobs (Table I). Among those who were working, most were earning USD131.6 (RM500) or less per month. In terms of residence, most of the respondents were living in urban areas.

In terms of marital status, almost all of the respondents were single, i.e., never married (Table I). A majority reported no experience with sexual intercourse, while 13% reported that they have had sex before.

Knowledge on HIV/AIDS

Table II shows the responses from the open-ended question on modes of transmission phrased as follows: "What are the ways HIV/AIDS is transmitted?" Multiple answers were allowed (up to five responses per respondent). The verbatim responses were compiled and coded as shown.

The most common response cited was related to sex (71%), e.g., sex, sexual intercourse, casual sex, promiscuous sex. A statistically significant higher proportion of the school-based sub-sample cited this response compared to the general public sub-sample. No other significant differences were found by socio-demographic factors.

Table II
Knowledge on HIV/AIDS:
Percent of Respondents by the Responses on Modes of Transmission¹ and
by Selected Background Characteristics (N=520)

Method of HIV/AIDS Transmission	N	%	p-value
a. Through sex or sexual intercourse/sex/promiscuous sex	520	70.96	
Sub-sample - General public	275	66.91	
School - based	245	75.51	0.031
b. Through sharing needles/IVDU/Skin piercing with infected needles	520	62.88	
Sub-sample - General public	275	56.73	
School - based	245	69.80	0.002
c. Through blood and blood products/blood transfusion	520	40.38	
d. Homosexual activities	520	24.62	
Race - Malay	272	28.68	
Chinese	142	14.79	
Others	106	27.36	<.05
e. Drug addicts/using drugs	520	8.85	
Education - ≤ 11 years	458	8.08	
> 11 years	52	17.31	<.05
Sub-sample - General public	275	13.45	
School - based	245	3.67	
f. From mother to baby during pregnancy	520	6.73	
Sub-sample - General public	275	2.91	
School - based	245	11.02	<.0001
g. Prostitutes	520	5.38	
Race - Malay	272	5.88	
Chinese	142	1.41	
Others	106	9.43	0.019
Sub-sample - General public	275	8.00	
School - based	245	2.45	0.005
h. Others	520	15.00	

¹ Multiple responses to open-ended question "What are the ways HIV/AIDS is transmitted?" were compiled verbatim and coded under the above categories

The next most common response was related to intravenous drug use (IVDU) (63%). Specific verbatim answers given were sharing needles, sharing syringes or skin piercing with infected needles. Again, a significantly higher proportion (70%) of the school-based sub-sample cited this mode of transmission compared to the general public sub-sample (57%). About nine percent gave responses related to drugs ('drug addicts', 'drug use') without specifying the intravenous route or needles or syringes. Significantly more of those with higher education level gave this response, and more among the general public sub-sample compared to school-based. That is, more of those with Form Six or higher and more among those recruited from the general public gave responses in this manner.

'Blood and blood products' or 'blood transfusion', including mentioning 'infected blood', was another common category of response, cited by about 40% of respondents. Other responses were cited by less than half or only by a minority of the respondents. Although the numbers citing 'mother to baby' transmission was quite small, a significantly and substantially higher proportion from the school-based sample compared to the general public respondents gave this response. Finally, there were differences by race as well as by sub-sample in the proportions who mentioned 'prostitutes' specifically. Worthy of note, 15% of respondents gave a variety of 'other' responses to this question, majority of which referred to incorrect methods of transmission, such as transmission by the dentist, barber, and shaving.

A series of questions were also posed to elucidate level of knowledge. Table III shows that only 30% of respondents agreed that a person infected with the HIV can look healthy. Significantly more Chinese (respondents correctly agreed on this question compared to other races, especially Malays.

However, when asked whether someone who looks healthy can pass the AIDS virus to others, slightly more than half of the respondents agreed

that someone who looks healthy could pass on the AIDS virus. Again, significantly more Chinese answered this question correctly.

In contrast to the number who cited perinatal transmission in the open-ended question described earlier, the majority of respondents correctly agreed that the HIV/AIDS virus can be passed from an infected mother to her baby during pregnancy or delivery (Table III). There were statistically significant higher proportions who agreed to this among Chinese respondents (90.78%) than other races, among the school sub-sample (86.83%) and among those without sexual experience.

Only a small proportion (7.86%) thought that there is a vaccine against HIV/AIDS, with significantly more among the younger (8.59%) compared to older group (6.56%). However, quite substantial proportions were not sure or did not know.

With regards to a cure for AIDS, only a minority (6.96%) of respondents said 'yes' to this question. However, significantly greater proportion of male (11.51%) than female (2.41%) respondents incorrectly answered this question.

Knowledge and Misconceptions about HIV/AIDS

Respondents were posed a series of questions on ways of disease transmission based on facts and common misconceptions. Overall, the majority of adolescents answered the facts on HIV/AIDS correctly and only small proportions had misconceptions about the disease.

As shown in Table IV, more than 90% knew that AIDS cannot be transmitted by casual contact, i.e., touching someone with AIDS.

However, a significantly greater proportion of youths in the general public sub-sample (7.58%) compared to the school sub-sample (2.46%) believed that AIDS could be transmitted through touch. Almost 20% thought that AIDS could be

Table III
Knowledge and Misconceptions about HIV/AIDS:
Percentage Distribution of Respondents by Responses to Questions,
and by Selected Background Characteristics

Question	Response			Total N	p-value
	Yes (%)	No (%)	Don't know /Not sure		
Can a person infected with the HIV/AIDS virus look healthy?	27.65	39.02	33.33	510	
Race - Malay	23.13	39.55	37.31	268	
Chinese	35.00	32.86	32.14	140	
Others	29.41	46.08	24.51	102	0.024
Sub-sample - General public	24.72	44.57	32.92		
School - based	30.86	32.92	36.21	510	0.026
Can a woman with AIDS or the AIDS virus pass it to her baby during pregnancy or at delivery?	82.97	2.35	14.68	511	
Race - Malay	80.60	2.99	16.42		
Chinese	90.78	0.71	8.51		
Others	78.43	2.94	18.63	511	0.042 ¹
Sub-sample - General public	79.48	3.73	16.79		
School - based	86.83	0.82	12.35	511	0.0281
Sexual experience - Yes	71.88	3.13	25.00		
No	84.91	2.43	12.65	475	0.0261
Is there a vaccine against AIDS?	7.86	65.42	26.72	509	
Age group - ≤ 19 years	8.59	61.35	30.06		
> 19 years	6.56	72.68	20.77	509	0.035
Can someone who looks healthy pass the AIDS virus to other people?	52.95	20.28	26.77	508	
Race - Malay	48.30	25.66	26.04		
Chinese	58.57	11.43	30.00		
Others	57.28	18.45	24.27	508	0.014
Do you think that a person who has AIDS or the virus that causes AIDS can be cured?	6.97	93.03	(n.a.)	502	
Sex - Male	11.51	88.49	(n.a.)	252	
Female	2.41	97.59	(n.a.)	249	<.0001 ¹

¹ Fisher's Exact Test

passed by sharing food or utensils with an infected person, and almost 13% by an infected person coughing or sneezing on someone. Similarly, about 13% thought that mosquito bites are a mode of transmission. Although casual skin

contact is generally dismissed as a means of transmission by majority of respondents, misconceptions tend to increase with transmission involving body fluids. Compared to touching, more respondents believed that being kissed on

Table IV
Knowledge And Misconceptions About HIV/AIDS Transmission:
Percentage Distribution of Respondents by Responses to Questions on Modes of Transmission¹
and by Selected Background Characteristics

Question:	Response		N	p-value
	Yes (%)	No (%)		
Can you get AIDS by doing any of the following:				
a. Touching someone who has AIDS or the AIDS virus?	5.12	94.88	508	0.009 ²
Sub-sample - General public	7.58	92.42		
School - based	2.46	97.54	508	
b. Using a public toilet?	5.50	94.50	509	0.005
Sex - Male	2.71	97.29		
Female	8.40	91.60	508	
c. Having sexual intercourse without a condom with a person who has AIDS or the AIDS virus?	91.94	8.06	509	
d. Sharing food, etc., with someone who has AIDS or the AIDS virus?	17.88	82.12	509	
e. Having a person with has AIDS or the AIDS virus cough or sneeze on you?	12.97	87.03	509	
f. Through mosquito bites?	13.53	86.47	510	0.0142
Location - Urban	15.03	84.97		
Rural	4.23	95.77	510	
g. Swimming in a public pool?	4.31	95.69	510	
h. Having a person with AIDS or the AIDS virus kiss you on the cheek?	10.02	89.98	509	0.007
Age group - ≤ 19 years	7.34	92.66		
> 19 years	14.84	85.16	509	
i. Using a needle or syringe that has been used by a person with AIDS or the AIDS virus?	90.96	9.04	509	
j. Donating blood where disposable equipment is used?	32.61	67.39	509	0.003
Race - Malay	27.24	72.76	268	
Chinese	43.88	56.12	139	
Others	31.37	68.63	102	
Location - Urban	34.47	65.53	438	
Rural	21.13	78.87	71	0.026

¹ Responses to closed-ended question "Can you get AIDS by doing any of the following?"

² Fisher's Exact Test

the cheek by a person with AIDS or HIV was a risk. Interestingly, almost twice as many older respondents answered 'yes' to this question. Significantly more girls (8.40%) than boys (2.71%) agreed that using a public toilet was a risk.

About eight percent answered 'no' to the question of whether AIDS can be caught by having sexual intercourse with an infected person without a condom. Another question on transmission by using a needle or syringe showed that less than

10% answered incorrectly ('no'). Finally, the question on whether one can get AIDS by donating blood where disposable equipment is used obtained a relatively high proportion of 'yes' responses. There are also significant differences by race and urban/rural location in the responses to this question. More than 40% of Chinese respondents answered 'yes' to this question, and more urban than rural residents.

Attitudes and Beliefs Related to HIV/AIDS

A list of 10 statements were posed to elicit attitudes and beliefs related to HIV/AIDS. As shown in Table V, almost 40% of respondents in the present survey said 'yes' to the statement that AIDS is confined to only drug users and homosexuals.

Significantly more of the older (46.11%) than younger (34.69%) respondents, and more of the general public youth (44.36%) compared to school sample (32.92%) thought so. The general public sub-sample, in any case, comprises a slightly older group compared to the school-based sub-sample. About 23% felt that 'a woman should not worry about getting AIDS if she remains faithful to her husband'. Significantly more male (27.56%) than female (17.89%) respondents agreed to this statement. Furthermore, almost one-fifth of the respondents, and more among the general public sub-sample, agreed that 'a man cannot get AIDS from having sex with a woman'. About 15% held the attitude that 'most people with AIDS got what they deserved'. This probably stems from the publicised fact that HIV/AIDS is a disease afflicted through personal behaviour, namely, sexual practices and drug use.

In terms of perceptions of personal risk of contracting the disease, quite a substantial proportion (41.72%) worry about catching AIDS, significantly more so among those with higher (62.50%) compared to lower (40.09%) education, and among urban (43.85%) compared to rural (28.57%) respondents. In view of concerns amongst Malaysians about catching AIDS in

specific situations, several statements were posed about the risk of transmission at the dentist and barber or hair salon. Again, a rather substantial proportion (36.25%) feared catching AIDS at the barber/hair salon. Significantly higher proportions of male respondents (42.97%) worried about the barber/hair salon compared to females (29.05%), and more than half the rural (56.52%) residents compared to 32.94% of the urban. Compared to the barber/hair salon, slightly fewer (29.94%) feared catching AIDS at the dentist. There were significant differences between groups by race, age group and educational attainment. In particular, more than half of those with higher (52.087%) than lower education (27.93%) worry about catching AIDS at the dentist. Despite the majority believing that HIV/AIDS cannot be transmitted via casual contact, as described in the previous section, only half of the respondents would not be afraid to visit a friend sick with AIDS.

To gauge the response to the informational and educational efforts by the Ministry of Health as well as other sources, such as the media and the non-government organisations, at that point in time, two statements were included on respondents' feelings towards more information. Although about 65% overall said that they would like more information, fairly large proportions within sub-groups did not. Specifically, significantly fewer males (60.63%) compared to females (69.92%) and fewer rural (50.00%) than urban (67.75%) residents desired more information. The more negative statement of "I am tired of hearing about AIDS" generated a 'yes' response from about 18% of the respondents, and significantly more among the general public sub-sample (23.51%) compared to 13.39% among school sub-sample.

Knowledge on HIV/AIDS Prevention

An open-ended question on what a person can do to avoid getting AIDS, allowing for multiple responses, generated a variety of verbatim answers that were then compiled and coded under relevant categories. The most common responses are listed in Table VI.

Table V
Attitudes and Beliefs Towards HIV/AIDS: Percent Distribution of Respondents by Responses to Statements, and by Selected Background Characteristics

Statement	Response		N	p-value
	Yes (%)	No (%)		
Only drug users and homosexuals get AIDS	38.80	61.20	500	
Age group - ≤ 19 years	34.69	65.31	320	0.012
> 19 years	46.11	53.89	180	
Sub-sample - General public	44.36	55.64	257	0.009
School - based	32.92	67.08	243	
I am worried about catching AIDS	41.72	58.28	501	
Education - ≤ 11 years	40.09	59.91	444	0.003
> 11 years	62.50	37.50	48	
Location - Urban	43.85	56.15	431	0.016
Rural	28.57	71.43	70	
As long as a woman is faithful to her husband, she should not worry about getting AIDS	22.75	77.25	501	
Sex - Male	27.56	72.44	184	0.010
Female	17.89	82.11	202	
I would like to know more about AIDS	65.27	34.73	501	
Sex - Male	60.63	39.37	254	0.029
Female	69.92	30.08	246	
Location - Urban	67.75	32.25	431	0.004
Rural	50.00	50.00	70	
I worry about catching AIDS at the dentist	29.94	70.06	501	
Race - Malay	23.95	76.05	263	0.004
Chinese	39.57	60.43	139	
Others	32.32	67.68	99	
Age group - ≤ 19 years	26.17	73.83	321	0.014
> 19 years	36.67	63.33	180	
Education - ≤ 11 years	27.93	72.07	444	<.0001
> 11 years	52.08	47.92	48	
I worry about getting AIDS at the barber or salon	36.25	63.75	491	
Sex - Male	42.97	57.03	249	0.001
Female	29.05	70.95	241	
Location - Urban	32.94	67.06	422	0<.0001
Rural	56.52	43.48	69	
Most people with AIDS got what they deserved	15.17	84.83	501	
I would not be afraid of visiting a friend sick with AIDS	50.51	49.49	491	
I am tired of hearing about AIDS	18.57	81.43	490	
Sub-sample - General public	23.51	76.49	251	0.004
School - based	13.39	86.61	239	
A man cannot get AIDS from having sex with a woman	19.35	80.65	491	
Sub-sample - General public	23.51	76.49	251	0.017
School - based	15.00	85.00	240	

Table VI
Knowledge on HIV/AIDS Prevention:
Percent Distribution of Respondents by Responses on Ways to Avoid Getting AIDS¹,
and by Selected Background Characteristics

Ways to avoid AIDS	Response		p-value
	%	N	
1. Avoid drugs/stop sharing needles	28.46	520	
2. Avoid sex	15.00	520	
3. Reduce sex/limit sexual partners	12.50	520	
Age group - ≤ 19 years	10.30	330	0.046
> 19 years	16.32	190	
4. Avoid homosexual practice	9.62	520	
5. Prayer/strengthen religious practice	8.46	520	
Race - Malay	14.34	272	<.00012
Chinese	1.41	142	
Others	2.83	106	
Location - Urban	7.13	449	0.006
Rural	16.90	71	
Sub-sample - General public	5.45	275	0.009
School - based	11.84	245	
6. Use condom during sex	8.08	520	
Race - Malay	4.41	272	0<.0001
Chinese	8.45	142	
Others	16.98	106	
Sub-sample - General public	10.91	275	0.012
School - based	4.90	245	
Sexual experience - Yes	15.63	64	0.014
No	6.70	418	
7. Be faithful to partner	6.15	520	
Race - Malay	3.68	272	0.003
Chinese	11.97	142	
Others	4.72	106	

¹ Open-ended question on "What can a person do to avoid getting AIDS?" with multiple responses from which various categories were coded, as shown

² Fisher's Exact Test

Overall, less than 30% of adolescents responded to this question. The most common means of prevention cited was related to avoiding drugs or sharing needles (28%), followed by avoiding sex (15%), reducing sexual encounters or limiting

sexual partners (12%), and avoiding homosexual practice (10%). A minority (8.46%) also cited responses related to strengthening religious observance - significantly more of whom came from Malays (14.34%) compared to other races

(1.41% among Chinese, 2.83% among other races), rural (16.90%) compared to urban (7.13%) respondents, and school-based (11.84%) compared to general public (5.45%) respondents. A small proportion (8%) also mentioned condom use as a means of prevention. Significantly more of other races (16.98%) mentioned this and fewest Malays (4.41%). In addition, more of the general

public sub-sample (10.91%) than school-based (4.90%) gave condom use as a response and more than twice the proportion of those who have had experience with sexual intercourse (15.63%) compared to those who have not (6.70%). Finally, a few respondents offered being faithful to your partner as a preventive measure, more so among the Chinese.

Summary Score for Knowledge on HIV/AIDS

A summary score to measure knowledge about HIV/AIDS was generated based on 16 items (close-ended questions) on the questionnaire, as follows:

<u>Question</u>	<u>Response (score=1)</u>
Can you get AIDS by doing any of the following:	
1. <i>Touching someone who has AIDS or the AIDS virus?</i>	No
2. <i>Using a public toilet?</i>	No
3. <i>Having sexual intercourse without a condom with a person who has AIDS or the AIDS virus?</i>	Yes
4. <i>Sharing food, etc., with someone who has AIDS or the AIDS virus?</i>	No
5. <i>Having a cough with AIDS or the AIDS virus cough or sneeze on you?</i>	No
6. <i>Through mosquito bites?</i>	No
7. <i>Swimming in a public pool?</i>	No
8. <i>Having a person with AIDS or the AIDS virus kiss you on the cheek?</i>	No
9. <i>Using a needle or syringe that has been used by a person with AIDS or the AIDS virus and has not been cleaned?</i>	Yes
10. <i>Donating blood where disposable equipment is used?</i>	No
11. <i>Can a person infected with AIDS look healthy?</i>	Yes
12. <i>Can a woman with AIDS or the AIDS virus pass it to her baby during pregnancy or at delivery?</i>	Yes
13. <i>Is there a vaccine against AIDS?</i>	No
14. <i>Do you think that a person with AIDS or the AIDS virus can be cured?</i>	No
15. <i>Among people who get AIDS, how many do you think will die from this disease?</i>	All of them
16. <i>Can someone who looks healthy pass the AIDS virus to others?</i>	Yes

A score of one was assigned to each answer deemed correct, and zero for incorrect or "don't know/not sure" responses. Hence, the maximum score possible was 16.

The average score for the respondents was 12.57 (sd 2.20; median 13), ranging from 4 to 16. This average is relatively high and supports the responses to the individual questions or statements described earlier. There were no significant differences in the average knowledge score by sex, race, age-group, urban/rural location, sub-sample, or sexual experience. Working respondents, however, had a significantly lower knowledge score compared to non-working respondents (Table VII).

Summary Score for Attitudes Towards HIV/AIDS

Five items on the questionnaire on attitudes and beliefs were selected to generate a summary score for Attitudes towards HIV/AIDS. These are as follows:

<u>Statement</u>	<u>Response (score=1)</u>
1. <i>Only drug users and homosexuals get AIDS.</i>	No
2. <i>I would like to know more about AIDS.</i>	Yes
3. <i>Most people with AIDS got what they deserved.</i>	No
4. <i>I would not be afraid of visiting a friend sick with AIDS.</i>	Yes
5. <i>I am tired of hearing about AIDS.</i>	No

Responses to these items were designated as positive (score one) or negative (score zero) towards HIV/AIDS. Hence, the summary score ranged from zero to five, whereby the higher the score the more positive the attitudes.

Overall, the average score for the respondents was 3.43 (sd 1.16; median 3) ranging from zero to five (Table VII).

There was no significant difference by any of the socio-demographic and sexual experience variables above. Moreover, the correlation between knowledge and attitudes scores was low (Spearman Rank Correlation = 0.199).

Perception of Self-Risk

A question was also included to assess respondents' perception of risk of contracting HIV/AIDS, specifically, "*If you were to continue living the way you do now, doing the things you do, what would be the chances of you eventually getting AIDS? Do you think it is very likely, somewhat likely, or not at all likely?*"

Out of 491 respondents who answered this question, the majority (80%) felt that they were 'not at all likely' to get the disease. Less than four percent perceived their risk to be 'very likely', and 16% 'somewhat likely'. Due to the small numbers, the latter two likely categories were combined ('very/somewhat likely') for further analyses. A significantly higher proportion of younger (24%) compared to older (14%) respondents felt they had some risk of AIDS (Table VIII).

Table VII
Summary Scores on Knowledge, and Attitudes Regarding HIV/AIDS

Summary Score	mean	sd.	median	N
Knowledge on HIV/AIDS ¹	12.57	2.20	13	482
Attitudes Related to HIV/AIDS ²	3.43	1.16	3	483

¹ Knowledge score derived from 16 items on questionnaire, as described in text

² Attitudes score derived from 5 items on questionnaire, as described in text

Table VIII
Perceived Risk to HIV/AIDS:
Percent Distribution of Respondents by Self-assessment of Risk to Getting HIV/AIDS¹,
and by Selected Background Variables

	Response		Total N	p-value	
	very/somewhat likely (%)	not at all likely (%)			
All respondents	20.37 ²	79.63	491		
Age-group -	≤ 19yrs	23.89	76.11	314	0.010
	> 19yrs	14.12	85.88	177	
Sub-sample -	General public	15.56	84.44	257	0.006
	School-based	25.64	74.36	234	
Sexual experience -	Yes	38.33	61.67	60	<.0001
	No	17.96	82.04	401	

¹ Response to question "If you were to continue living the way you do now, doing the things you do, what would be the chances of your eventually getting AIDS? Would it be very likely, somewhat likely or not at all likely?"

² Disaggregated responses: Very likely (3.87%); Somewhat likely (16.50%)

By sub-sample, far more school-based (26%) than general public recruited respondents (15%) felt this way. As described previously, respondents recruited through schools are younger, less sexually experienced and not employed, compared to the general public group. Finally, about twice as many among the sexually experienced group (38%), i.e., those who have had sexual intercourse, perceived his/herself somewhat or very likely at risk of AIDS compared to those not experienced (18%). This difference was highly significant.

In regard to the association between AIDS knowledge and perception of self-risk, there was a marginally significant difference ($p=0.045$) in the average summary scores between respondents in the 'very/somewhat likely' (mean 12.20; sd 2.23, median 13) and 'not at all likely' (12.72, sd 2.15, median 13) risk categories. That is, those who considered themselves not at risk of contracting HIV/AIDS scored slightly higher in knowledge about HIV/AIDS, as measured in this study.

Based on the above results, multivariate logistic regressions were modelled to assess determinants of perceived risk. The independent variables examined are sexual experience, age-group, sub-sample, and summary knowledge score. Summary knowledge score was included as Low score versus higher scores based on the 25th percentile.

The results of the regression analyses are shown in Table IX.

Sexual experience was found to be a highly significant predictor of perceived risk. In fact, it is expected that those who are sexually active perceive themselves at risk of sexually transmitted diseases compared to those who are not. Interestingly, older respondents as well as the general public sub-sample consider themselves at lower risk compared to younger and school-based respondents, respectively. Yet, there are more sexually experienced respondents among the older group, and among the general public group, who also tend to be older. When age group and sub-sample are controlled for, sexually

Table IX
Multivariate Logistic Regressions on Adolescents' Perceived Risk to HIV/AIDS

Independent Variables ¹	Odds Ratio	Std.error	P < z	95% Confidence Interval	
Sexual experience	2.84	0.84	0.000	1.59	5.07
Sexual experience	3.51	1.09	0.000	1.91	6.45
Age group	0.39	0.11	0.000	0.23	0.67
Sexual experience	4.48	1.49	0.000	2.33	8.60
Age group	0.48	0.14	0.010	0.27	0.84
Sub-sample	0.50	0.14	0.011	0.30	0.85
Sexual experience	4.42	1.47	0.000	2.30	8.50
Age group	0.49	0.14	0.014	0.28	0.86
Sub-sample	0.50	0.14	0.011	0.29	0.85
Low knowledge score	1.90	0.56	0.029	1.07	3.37

¹ Variables: Perceived Risk (0 not at all, 1 somewhat/very likely); Sexual experience (0 no, 1 yes); Age group (0 ≤ 19 yrs, 1 > 19 yrs); Sub-sample (0 school-based, 1 general public); Low knowledge score (0 ≥ 11, 1 < 11)

Note: Final model: $R^2 = 0.076$; $p < 0.0001$; $N = 461$

experienced adolescents are four times more likely to consider themselves at risk of HIV/AIDS compared to those who are not. Finally, a lower knowledge on AIDS is associated with a higher chance of perceiving oneself at risk of contracting HIV/AIDS, independent of sexual experience, age and sample of respondents.

Discussion

Reproductive health encompasses issues of sexuality, contraception, pregnancy and births, and sexually transmitted diseases (STDs). The International Conference on Population and Development 1994 held in Cairo has called for specific attention to the reproductive health of adolescents whereby "... *information and services should be made available to adolescents that can help them understand their sexuality and protect them from unwanted pregnancies, STDs and subsequent risk of infertility. This should be combined with the education of young men to respect women's self-determination and to share responsibility with women in matters of sexuality and reproduction.*" (para 7.41)(11). This gives official recognition, ratified by Governments of

signatory countries, to the reproductive health risks, including of HIV and AIDS, faced by young men and women^{12, 13}. In fact, the World Health Organisation estimates that the highest rates of HIV infection are among youths aged 20 to 24 years, followed by adolescents aged 15 to 19 years, and furthermore, 60% of new infections are among these age groups¹². Hence, studies on adolescents' knowledge and attitudes towards HIV/AIDS, and their sexual behaviour, are important elements in prevention and control.

In the present study on knowledge and attitudes related to HIV/AIDS in Malaysia, it is noteworthy that the majority of the adolescent respondents possessed relatively accurate knowledge on transmission (particularly via sex and drug needle/sharing, two of the three main routes of HIV transmission), cure and prevention of HIV/AIDS. This is evidenced by the high average knowledge summary score of 13 (maximum=16), which compares well with teenagers in other developing countries, such as, India & Nigeria who were found to have limited knowledge on transmission of the disease^{14, 15}. In addition, a large proportion of them correctly pointed to unsafe

sexual practices and infected blood conditions as the modes of transmission of HIV/AIDS versus sexual orientation, such as homosexuality for instance. The school-based sub-sample was found to be significantly more knowledgeable. This is not surprising given the focus of HIV education in Malaysia has been targeting at school-going children and youths¹⁶. Unlike other similar studies of KAP among adolescents 14, we did not find any significant difference in knowledge between boys and girls in knowledge score.

The study revealed that only a small percentage had misconceptions about the disease. This is in contrast to some studies carried out in Massachusetts and Nigeria where teenagers were found to have misconceptions that HIV/AIDS is being spread via hand-shaking, eating utensils, using public toilets and kissing^{17,18}. Yet, it needs to be pointed out that in this study, although casual skin contact was generally not regarded as means of transmission of HIV/AIDS, misconceptions tended to increase when body fluids were involved. This showed that there still existed doubts and gaps in the knowledge on transmission among the adolescents in the study, despite their relatively high knowledge score discussed earlier. For instance, although the Ministry of Health's campaign to educate the public on HIV/AIDS includes the message that blood donation is not a means of getting AIDS if disposable equipment is used, there still seems to be doubts on this since majority agreed with the statement that one can get AIDS by donating blood where disposable equipment is used.

It is interesting to note that although objectively, majority of the respondents were aware that transmission of HIV/AIDS is basically through high risk behaviours, such as, unprotected sex and blood contamination, a substantial proportion of them still held the attitude that HIV/AIDS was confined only to high risk groups, particularly homosexuals and drug users. This could be because of the bias towards portraying the latter: for instance, in the early stages of the epidemic, AIDS first received widespread publicity as a

disease of the homosexual community. In Malaysia, on the other hand, cases are generally detected amongst drug dependants. The findings also revealed an apparent contradiction in the attitudes towards sexual behaviour, albeit not among a large proportion, of the adolescents studied. Slightly more than a fifth of them, and significantly more of the men, held the attitude that women who remain faithful to their husbands should not worry about getting AIDS. Yet, in contrast, they believed that a man cannot get AIDS from having sex with a woman. This contradiction connotes that a woman could contract HIV/AIDS from having sex with men other than her husband, but at the same time, a man cannot be so infected by having sex with a woman. These attitudes could reflect society's double standards and gender bias with regards to sexual behaviour of men and women: a woman should be faithful to one man, her husband, and thus will not contract AIDS; but a man could have sex with any woman, wife or otherwise, since he could not get AIDS from having sex with a woman. Such attitudes will have important bearings on education and preventive programs which will be discussed shortly.

In addition, half of the adolescents studied reported that they would be afraid to visit a friend sick with AIDS despite the fact that they were aware that HIV/AIDS cannot be transmitted through casual contact. This is similar to the findings of a study of Nigerian school-going youths which revealed that 77% would stop seeing friends and 63% would reject relatives who have developed AIDS¹⁷. However, on the whole, the respondents had a relatively high average score for positive attitudes towards AIDS, viz., majority of them held positive attitudes towards people infected with HIV/AIDS or that they would like to know more about the disease.

Pertaining to perceived susceptibility to HIV/AIDS, slightly less than half were worried about contracting the disease, more so amongst those with higher education and those staying in the urban areas. Interestingly, significantly more

males feared being infected at the barber's salon than being attended to by the dentist, which seems surprising considering the more invasive procedures involved in the latter. On the other hand, the use of the usually unsterilised instruments, such as, scissors and shaving blades, at the barber's could have caused the relative higher anxiety compared to the sterilised procedures assumed to be practised by the dentist. However, when posed a specific question on self-perceived risk of contracting HIV/AIDS, 80% of the adolescent respondents reported that they did not perceive themselves to be at risk. It is noteworthy that of the small proportion who did perceive themselves to be at risk, they were significantly more of those who were sexually experienced, young and from the school sub-sample. Logistic regression analyses confirmed that sexual experience was a strong predictor of perceived risk. However, when sexual experience, age, and sub-sample were controlled for, knowledge score emerged significant. This would have important implications for prevention strategies targeted at the teenagers and youth to be elaborated subsequently.

With regards to knowledge on prevention of HIV/AIDS, it is significant that half of those who responded pointed to various ways pertaining to sexual practices and behaviour. It is interesting to note that of these, abstinence was the most frequently cited versus condom use during sex being the least reported. They also pointed out that promiscuity and homosexual practices were to be avoided in order to prevent contracting the disease. More than a quarter also suggested avoidance of specific high risk behaviours, such as, drug taking and sharing needles.

The paper now wishes to highlight several topical issues related to adolescents and HIV/AIDS, and implications for prevention strategies and programs in the light of the above findings. It needs to be pointed out that a high knowledge score on HIV/AIDS amongst these Malaysian adolescents is not necessarily an indicator that they would be engaging in the desired behaviour

with regards to protecting themselves against the disease. The findings revealed that knowledge score of HIV/AIDS had no association with sexual experience, viz. adolescents who are sexually active/experienced may or may not have accurate and adequate information on the disease. The logistic regression analyses of the determinants of perceived risk further confirmed the independence between sexual experience and knowledge of HIV/AIDS. Thus, sexually experienced adolescents who are engaging in high risk behaviour may not realise that they are at risk in contracting HIV/AIDS. This is not surprising as several studies on risk reduction among teenagers have established the fact that having accurate and adequate knowledge on HIV/AIDS does not lead to changes in high risk sexual behaviours. For instance, one study in the United States showed that African-American adolescents were knowledgeable about HIV/AIDS and, at the same time, reported multiple sex partners and engaged in higher frequencies of unprotected vaginal intercourse¹⁹. Another study on HIV/STD risk behaviours and intention to engage in risk behaviours among adolescents in Mumbai (Bombay), India found that males were less likely to believe in abstaining from sexual activity and more to engage in it²⁰. Although the proportion of sexually experienced adolescents in this study is relatively small, it is very worrisome to discover that 72% of them did not use any protection at first sexual intercourse.

These issues point to the need for more critical reviews of HIV/AIDS education and prevention strategies that are often limited to providing teenagers with information and not emphasising behavioural change. Although there is relatively little research done on sexual practices and behaviours in the Malaysian setting⁹, of the three main sexual subcultures of celibacy, monogamy, and free experimentation, it is not wrong to say that the first is generally neither the norm nor is it encouraged by local society. While monogamy may be the common expression outwardly, some amount of free experimentation is certainly practised, especially by the adolescents since

sexual expression is an important element of becoming an adult. A ten-year study of the sexual behaviour of college students in British Columbia, Canada found that despite the AIDS epidemic, most students have not adopted careful sexual practices, either in number of partners or use of condoms. The sexual decisions of adolescents are generally filtered through three culturally determined screens: the meaning of sexuality, the process of male-female negotiations, and adolescents' perception of danger²¹. So far, majority of AIDS prevention programs and research have dealt less with the meaning of sexuality and process of male-female negotiations than the latter. In order that adolescents and youth achieve better balance among their needs for sex, love, freedom, and self-preservation against the AIDS epidemic, both the understanding of and specific skills in negotiating for safer sex and practising safer sex should be emphasised in HIV/AIDS prevention programs. This will enable and empower adolescents towards either behaviour change or desirable behaviour being protective against the disease. For instance, negotiating for safer sex contains elements of impression management, requires assertiveness and takes constant effort, even among those who have made the most progress in incorporating it. Practising safer sex involves a complicated process of sexual negotiation, requiring a degree of open communication about sexual desire and intent that is not widely available in our culture as yet²². The Department of Paediatrics at University of California, San Francisco has proposed HIV prevention programs that utilise strategies which combine cognitive and behavioural skills training, based on models and theories of risk behaviour called the AIDS Risk Reduction Model (ARRM)²³. Physicians have been urged to become more actively involved in HIV prevention efforts by routinely assessing adolescent patient's sexual behaviour and utilising their clinical interaction to provide HIV education and promote the adoption of HIV risk-reduction behaviours²⁴. At the same time, peer-counselled AIDS education programs were found to have significant effects

for knowledge and attitudes toward practising personal preventive behaviours against HIV/AIDS²⁵.

Although the study did not show significant gender differences in the overall knowledge of HIV/AIDS, certain differences in perceptions, beliefs and attitudes found between male and female adolescent respondents would have implications for implementation of prevention programs. As it has been mentioned earlier, more young men held the attitude that a woman who is faithful to her husband has no worries about contracting HIV/AIDS. Not only does this attitude reflect gender bias in sexual behaviour as pointed out earlier, it also tends to perpetuate the misconception that married women in monogamous relationships would not be at risk of contracting the disease. In fact, religious teachers have been advising adolescents and youths that getting married is a way to avoid contracting HIV/AIDS. Whilst in the United States, a study on gender differences in HIV-related knowledge, attitudes and behaviour among college students revealed that men were significantly more likely to believe that monogamy obviates the need to use condoms²⁶.

These gender differences and gender bias are in stark contrast to reality: studies in Africa, where there are already six women with HIV for every five men, have shown that many married women have been infected by their one partner - their husband. It has been alleged that simply being married is a major risk factor for women who have little control over abstinence or condom use at home, or over their husband's sexual activity outside it. Moreover, research has also shown that the risk of becoming infected with HIV during unprotected vaginal intercourse is as much as two to four times higher for women than men. Thus, not only are married women at possible risk of contracting HIV/AIDS from their husbands, women in comparison to men are at higher risk during unprotected sex due to the more efficient male-to-female transmission. Given the perpetuation of such gender bias attitudes, many

HIV/AIDS prevention campaigns often fail women by assuming that they are at low risk, or by urging prevention methods that women have little or no power to apply, such as, condom use, abstinence and mutual fidelity. Instead, the principle of equal responsibility between men and women in preventing HIV/AIDS should be inherent in all prevention programs²⁷.

Conclusions

In conclusion, this study has revealed that although Malaysian adolescents may have relatively high knowledge score of transmission and prevention of HIV/AIDS, there remain gaps and misconceptions which need to be addressed. Another more serious finding that has emerged is that high knowledge score is independent of sexual behaviour and practices, viz. knowing all about HIV/AIDS may not necessarily be protective against contracting the disease. Gender differences in perceptions, beliefs and attitudes, particularly with regards to sexual behaviour, is another important finding.

Adolescents constitute a very important segment of a population, more so in developing countries where the majority of the 519 million people aged 15 - 19 years in the world live²⁸. Despite declining birth rates, the proportion of the population between 15 to 19 years will remain substantial for some time. Southeast Asian countries, in particular, will have increases of between 30 to 50 percent from 1980 to 2010²⁹. They, thus, form a

substantial human capital resource, the quality of which must be nurtured to ensure productivity and the nation's social as well as economic development. An important aspect relates to health - physical, social and mental - which has an impact that extends into adulthood.

The paper calls for a critical review of HIV/AIDS prevention programs so that innovative and more behaviour-change strategies would be developed specifically to reach all adolescents, ranging from those attending school and living with their families and those who are working and staying away from home. In addition to accurate information on transmission of HIV/AIDS, prevention strategies and programs must also address risk-taking behaviours among adolescents openly and without moral judgement. In discussions on sexual behaviour, for instance, the meaning of sexuality, the process and skills in male-female negotiations all need to be emphasised. Appropriate considerations based on gender, socio-economic status or class, culture, rural or urban settings in such HIV/AIDS prevention programs must also be made.

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