

A Study of the Effectiveness of AIDS Health Education Interventions among the Adolescent Population of Singapore

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ABSTRACT

Aim of study: This study aims to evaluate the effectiveness of existing AIDS health education interventions in Singapore amongst the adolescent population of Singapore. By identifying specific target groups that lack knowledge and information regarding HIV, it is hoped that suggestions may be provided towards increasing the effectiveness of these interventions.

Method: A cross-sectional survey using a self-administered questionnaire of randomly selected adolescents between the ages of 13 and 19 years was performed to assess their knowledge of HIV and their opinions and awareness of HIV education in Singapore.

Results: A total of 400 adolescents of various backgrounds were surveyed. In general, the subjects surveyed possessed reasonably good knowledge about HIV/AIDS, with an average score of 77.4% (SD =15.8%). However, the results also showed areas of knowledge deficiency and misconception prevalent among those surveyed.

Subgroup analysis showed that adolescents from low-income families, relatively less academically successful schools and those of younger ages knew significantly less than other adolescents.

In terms of the awareness of HIV/AIDS education and information, the percentage of the subjects who could recognise any of the three commonly issued pamphlets or poster or who knew of any telephone numbers to call to receive information on HIV and AIDS was low.

Less than 40% of those surveyed felt that enough awareness was being created within the public regarding AIDS.

Conclusion: It can be concluded that most adolescents surveyed felt that they are inadequately educated regarding HIV and AIDS. The results would suggest the need for focusing more efforts on

certain target groups using the appropriate media in future educational intervention.

Keywords: HIV, AIDS, adolescents, health education, Singapore

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INTRODUCTION

The Human Immunodeficiency Virus (HIV) has now infected more than 47 million people worldwide. This number is constantly rising, with an estimated 16,000 new infections being reported every day⁽¹⁾. Among those infected, 1.1 million are children below the age of 15, and over 50% of new infections are young people between 15 to 24 years old⁽¹⁾, clearly highlighting the rapid spread of HIV in the world, especially among teenagers and young adults.

In the United States of America, it was estimated that in June 1996, there were about 205,000 people living with HIV, with 44,000 new cases being reported in the year of 1997 alone. HIV has also been the leading cause of death among men aged 25 to 44 years in the USA since 1994⁽²⁾. With more than 2.2 million deaths in 1998 worldwide, HIV/AIDS has now become the fourth leading cause of mortality and its impact is ever increasing. Over 95% of all AIDS cases and deaths occur in the developing world, mostly among young adults and increasingly in women⁽³⁾.

In Singapore, 1,547 persons were HIV positive, and 864 cases of AIDS were reported as at 31 October 2001⁽⁴⁾. These numbers are relatively low when compared to many other countries in the region. However, the geographic location of Singapore with increasing numbers of international travellers passing through and the rapid spread of HIV/AIDS in South-east Asia poses a formidable challenge to health care planners. The available data on HIV infection in South-east Asia clearly suggest an epidemic increase within high-risk population groups, together with an increase among the population in general. In some areas of Cambodia, surveys of commercial sex workers in 1995 showed infection rates in excess of 39%. HIV-positive rates in blood donor screening have

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increased from under 0.1% in early 1991 to 6% in 1995. A 1995 survey of pregnant women in provincial centres showed a 4% HIV-positive rate⁽⁵⁾.

In view of the rapid spread of HIV infections in the neighbouring countries, steps have to be taken to check the spread of HIV in Singapore. Despite the large advances that have been made regarding the treatment of HIV and other antiretroviral treatments, no vaccine or cure has yet been discovered. In the circumstance of HIV attaining epidemic proportions in Singapore, the consequences on public health would be dire indeed.

HIV can be transmitted in a few ways: infected blood components and clotting factor concentrates, perinatally, and through sexual contact. HIV can also be found in other body fluids like semen, saliva, blood, urine, cerebrospinal fluid and sweat. No evidence has been found of HIV being transmitted by casual contact, food, water or insects like mosquitoes^(3,6,7).

Due to the limited ways by which HIV can be transmitted, increasing the awareness of the public regarding HIV and their knowledge of HIV and AIDS will greatly assist in overcoming increasing infection rates. National surveys and public opinion polls conducted in the West as well as locally have suggested that a large percentage of the general population is often misinformed about how HIV can be transmitted^(8,9). Thus, the public, especially youths, must be supplied with reliable, readily available information on AIDS to enable them to dispel unfounded misconceptions regarding HIV and know how to protect themselves against infection. This is of great importance as overseas research has shown that youths form a high-risk group for AIDS, being at a stage of exploration where risks are often taken with regards to sexuality and drug abuse⁽¹⁰⁻¹²⁾. In Singapore, the sexual route remains the main mode of HIV transmission and accounts for 96% of all Singaporeans infected so far, with heterosexual transmission overtaking homosexual transmission since 1991. Close to three-quarters (68%) of the cases were between the ages of 20 to 39 years at the time of diagnosis⁽¹³⁾. Due to the long latent period before HIV positive individuals develop full-blown AIDS, and the age of diagnosis in Singapore, the importance of youth education should not be under stressed.

The Ministry of Health (MOH), along with various other organisations like Action For AIDS (AFA), has been carrying out a vigorous campaign to educate the public on HIV, including putting up posters in public areas, distributing pamphlets, and spreading information through television and newspaper advertisements, with youths being one of the main targeted groups. It is expected that with

heightened awareness and better knowledge of HIV and AIDS, the spread of HIV in Singapore can be checked.

The objective of this study was to evaluate the effectiveness of the education programme regarding HIV within the adolescent population in Singapore, by determining their level of knowledge of HIV and AIDS, and by surveying their own views regarding the HIV education programme in Singapore. This survey also attempted to identify particular groups of adolescents with relatively poor knowledge regarding HIV/AIDS that the MOH could possibly target for their AIDS awareness campaigns.

METHODS

A survey questionnaire was first drawn up with the purpose of effectively determining the level and depth of knowledge of the participants involved, including their awareness of the various services and programmes regarding AIDS available in Singapore. The questions in the questionnaire were designed after studying the education materials used by MOH for AIDS.

The multiple-choice questionnaire comprised two components: (a) a general knowledge section consisting of 31 questions, where participants answered "True", "False", and "Don't know" to a series of statements regarding AIDS and HIV; and (b) an "AIDS Awareness Programmes" section, in which participants gave their opinions on the various awareness programmes carried out by the MOH. Participants also supplied demographic information on their age, gender, race, school, and monthly family income.

The participants were selected at random from and were surveyed at various secondary schools, junior colleges, Institutes of Technical Education (ITE), the National University of Singapore, Nanyang Technological University, and other public areas. The required criterion was that the participants must be between 13 to 19 years of age. The survey was carried out using the abovementioned self-administered questionnaire during the last two weeks of May in 1999. The time for the survey was in the afternoon during the school term.

Following the collection of all completed survey forms, the answers given by every participant were then individually tabulated and analysed. The data were analysed initially as a group and then further according to some of the demographic factors of the respondents. The demographic factors used were gender, age, education level and family income. All comparative statistical analyses were performed using the Mann-Whitney U Test with significance level of <0.05.

Table I. Demographic information of subjects (n=400).

Age (Years)	Number of Subjects	Family Monthly Income	Number of Subjects	Education Level	Number of Subjects	Race	Number of Subjects
13	44	Not reported	16	Secondary School	230	Chinese	364
14	58	<\$1,500	62	Junior College	128	Indian	12
15	65	\$1,500 - \$3,000	122	Polytechnic	18	Malay	13
16	66	\$3,000 - \$6,000	113	Institute of Education	7	Eurasian	5
17	98	\$6,000 - \$10,000	59	NUS/NTU	3	Others	2
18	42	\$10,000 - \$30,000	23	Not reported	14	Not reported	4
19	27	>\$30,000	5				

RESULTS

Demographics of participants

A total of 400 subjects participated in the survey. Of these subjects, 167 were males and 213 were females, and 20 did not record their gender. The subjects were predominantly Chinese, and mainly attending secondary school or junior college during the time of the survey. The other demographic information of the subjects is shown in Table I.

Overall performance

The average score of the respondents was 77.4% (SD =15.8%; median = 80.6% and mode = 90.3%). The distribution of the scores is shown in Fig. 1.

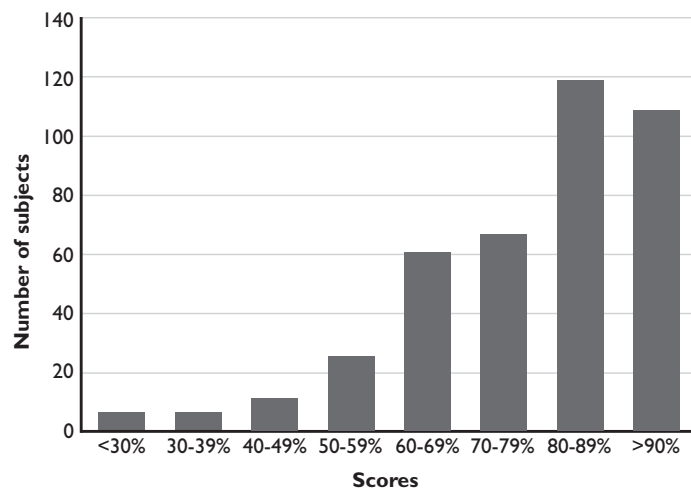
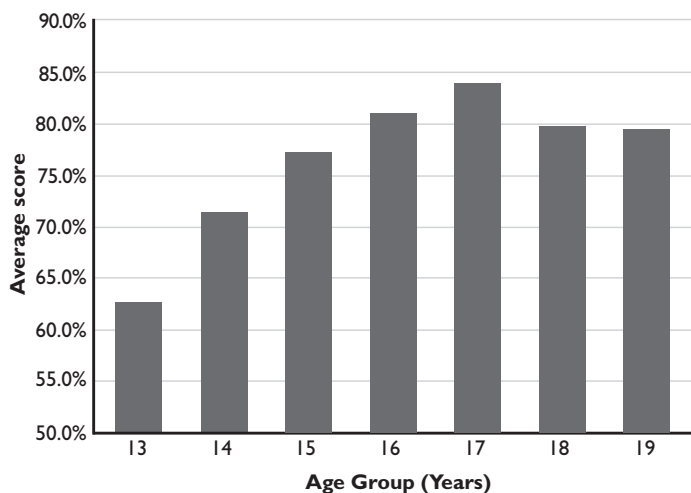
The data were analysed further according to the other demographic factors of the respondents. The results of the analysis are shown as follows.

Performance of participants with respect to age

A trend was observable when the average scores in the first section of the participants at different ages were compared, with 13-year-old achieving the lowest average score of 62.5%. The scores increased fairly consistently with age until the age of 17 (with 83.9% average score), with a slight decrease at the ages of 18 and 19 (with average score of 79.7% and 79.3% respectively) being observed. The results show that the age of the adolescent does make a significant difference in his/her level of knowledge regarding HIV/AIDS. Fig. 2 shows the variation of average score with age.

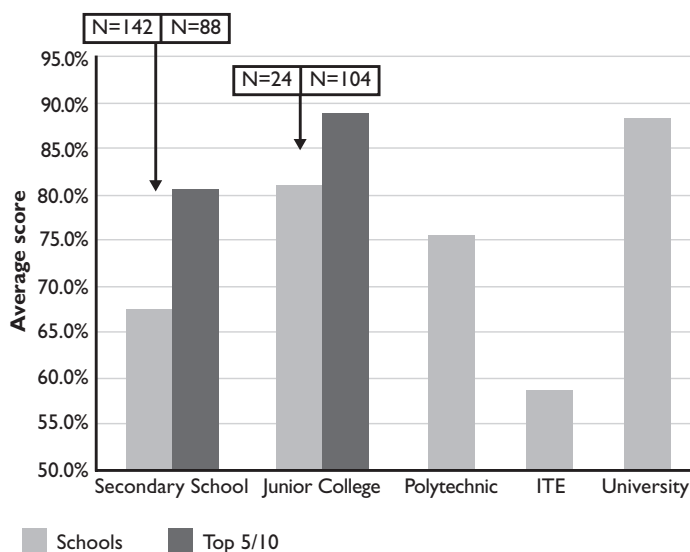
Performance of participants with respect to gender

No significant difference was observed between the average scores of male and the female respondents (76.5% and 78.5% respectively). This shows gender does not play a significant role in determining a group of adolescents who are relatively less well informed about AIDS/HIV.

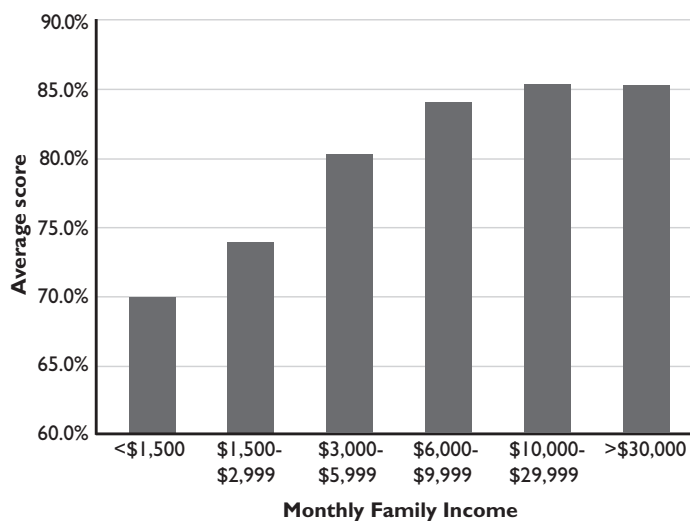
Fig. 1 Distribution of scores.**Fig. 2** Average score of different age groups.

Performance of participants with respect to education

In determining the relationship between the education of adolescents and their knowledge of HIV and AIDS, the data were analysed according to the level of education, and the type of school within the separate levels of education of the subjects.

Fig. 3 Average scores based on education levels.

NB: The bar beside the top 5/10 junior colleges/secondary schools specifies the average scores of participants who are not in the top 5/10 junior colleges/secondary schools, not the average scores of all the secondary school/junior college students, and the number on top specifies the number in each subgroup.

Fig. 4 Average scores of different income groups.

The level of education refers to whether the participant is in secondary school, junior college, university, or any other institutions, while the type of school is only used for secondary schools and junior college. The data of the subjects attending secondary schools and junior colleges were further analysed. This was done by comparing the average score of the participants in the top ten secondary schools and in the top five junior colleges, to the average score of the participants in other secondary schools and junior colleges. The selection of the top ten and five secondary schools and junior colleges was based on their performance in the 1997 GCE 'O' and 'A' level examination results respectively⁽¹⁴⁾. The top ten secondary schools chosen were Raffles Institution,

Raffles Girls' (Secondary), The Chinese High, Nanyang Girls' High, Dunman High, River Valley High, CHIJ St. Nicholas Girls', Singapore Chinese Girls', Anderson Secondary and Methodist Girls' (Secondary). The top five junior colleges taken were Raffles, Hwa Chong, Victoria, National, and Temasek Junior Colleges.

It was observed that as the level of education of adolescents increased, so did their average scores correspondingly. The average score of junior college students (87.4%) was significantly higher than those of secondary school students (87.4% vs. 72.4%, $p < 0.001$). The average score for university students, those with the highest educational qualifications, was 88.2%, the highest. However, it is not statistically different from the scores of junior college students.

Within secondary schools and junior colleges, students from the selected top ten secondary schools and the selected top five junior colleges attained significantly higher average scores than those from the other secondary schools and junior colleges ($p < 0.001$). Fig. 3 shows the average scores of the various schools.

Performance of participants with respect to monthly family income

The average scores were observed to increase with the monthly family income of the participant. Participants with a family income of less than \$1,500 had an average score of 70.1%, and this value increased steadily with monthly income. Participants with a monthly family income from \$10,000 to \$29,999 had the highest average score of 85.3%, with a slight fall to an average score of 85.2% for those with a monthly family income of \$30,000 or more. This dip could be due to the very small number of participants with a monthly family income of this range. However, it can be concluded that participants with higher monthly family income possess greater knowledge of HIV than participants with lower monthly family incomes. Fig. 4 shows the variation of average scores with monthly family income. The average scores of the subjects from the two lowest family income groups were statistically significantly lower than the rest ($p < 0.001$).

Awareness of HIV/AIDS education and information

The second section of the questionnaire aimed to evaluate the amount of HIV education propaganda the respondents were exposed to, and on their opinions of HIV awareness within the public. This included questions on whether their school had ever been visited by officers to tell them about HIV, and whether they recognised any of the three pamphlets and a poster attached to the survey form. The pamphlets and poster are often given out or put up

by the various AIDS organisations in Singapore. Participants were also asked to specify some sources that they had received information on HIV and AIDS. They were also questioned on their knowledge of the services provided for people infected with HIV.

Out of the 400 participants, only 37.3% recalled having had public health officers visit their schools to tell them about HIV and AIDS. Although 61.3% had received pamphlets giving information on HIV and AIDS before, only 10.8% recognised the first pamphlet, 22% recognised the second, and 8.0% recognised the third. Of all the subjects, 35.3% recognised the poster.

In terms of the source of information on HIV and AIDS, by far, the three media that the most subjects listed were television (87.8%), posters (79.3%), and newspapers (73.3). However, only 36.5% of those surveyed felt that enough awareness was being created within the public regarding AIDS. In addition, only 14% knew of any telephone numbers to call receive information on HIV and AIDS, just 21.3% knew of the organisation Action for AIDS Singapore (AFA). Only 19.3% knew of any testing centres where one can be tested for HIV.

DISCUSSION

On average, the participants gave correct responses to 77.4% of the statements, or approximately 24 statements, out of the 31 in the first section of the survey. This is a satisfactory score, showing that most of those surveyed possessed at least a basic knowledge of HIV and AIDS. This is congruent with the conclusion from an earlier local study that surveyed knowledge levels regarding HIV amongst a slightly older group of Singaporean youths⁽⁹⁾.

However, there were certain statements to which a large percentage of participants answered "Don't Know", showing a lack of knowledge or confusion regarding the particular area.

A total of 122 respondents (30.5%) chose "Don't Know" to the statement "If a person is tested negative for HIV, he still may be tested positive three months later." Awareness of this fact is essential to those who may wish to go for an HIV antibodies test, for some may assume wrongly that they definitely do not have HIV if they are negative for the test. Another statement that a surprisingly large number of those surveyed answered "Don't Know" for was the false statement "There is a vaccine for AIDS", which 88 subjects (22% of the participants) answered "Don't Know". This may have been due to confusion arising from the widely circulated news regarding the release of the newly introduced Highly Active Antiretroviral Therapy (HAART), that might have been falsely

interpreted by the public as being a vaccine for AIDS due to their misunderstanding of the jargon used when referring to HAART.

In addition to the few areas of HIV which the participants lacked knowledge in, there were also several questions that the participants largely answered wrongly, pointing towards the presence of misconceptions among the participants. To the false statement "A positive test for HIV means that HIV itself was detected in the body," 283 respondents (70.8%) gave the wrong answer. Two hundred and twenty respondents (55%) also gave the wrong answer for some statements regarding transmission of HIV, the false statements that HIV can be spread by mosquitoes and by donating blood in Singapore, having especially high numbers of respondents giving wrong answers (145 and 225 respondents, or 36.3% and 56.3% respectively). The misconception that AIDS directly causes death was also common, with 145 respondents (36.3%) giving incorrect answers. These would most probably have been caused by baseless rumours circulated amongst the public and a lack of information supplied to the public.

Therefore, these are probably the areas that the public healthcare educators could exert more efforts to pass on more accurate information.

When the data were further analysed according to the different demographic information of the subjects, the results showed that respondents from higher-income families, and academically better schools or junior colleges possessed better knowledge about AIDS/HIV. The very low scores obtained by the students from ITE could be an anomaly due to the small number of subjects (n=7) involved, and the fact that one of the subjects obtained an extremely low score (<10%). If the score from this particular respondent was ignored, the average score of subjects from ITE was similar to those obtained by subjects from secondary school (67.4% vs. 66.8%).

In general, the results revealed that respondents of younger age, from families with lower monthly income and neighbourhood schools were less knowledgeable regarding HIV/AIDS. These adolescents are therefore more at risk of being infected by the disease. Hence, adolescents from these groups might need more educational efforts from healthcare educators. Regrettably, there were not enough representatives from the different racial groups in this study to allow a meaningful analysis of the influence of ethnicity on HIV/AIDS awareness.

In assessing the awareness of HIV/AIDS education and information, the results were not very encouraging. Although 61.3% of the subjects had received pamphlets giving information on HIV and AIDS before, the

percentage of the subjects who could recognise any of the three commonly issued pamphlets or poster was low. It is rather surprising as nearly 80% of the respondents listed posters as their source of information about HIV and AIDS, but of all the subjects, only 35.3% recognised the poster attached with the survey form.

Similarly, the percentage of subjects who knew of any telephone numbers to call to receive information on HIV and AIDS, and those who knew of the organisation Action for AIDS Singapore (AFA), and any HIV testing centres were also low.

In addition, less than 40% of those surveyed felt that enough awareness was being created within the public regarding AIDS. Thus, it can be seen from the responses that those surveyed felt that Singaporeans are inadequately educated regarding HIV and AIDS, or that the educational measures are not having their intended effect.

CONCLUSIONS

From the results of the survey, it can be concluded that the level of knowledge of HIV and AIDS possessed by the adolescent population of Singapore is satisfactory. However, AIDS Health Education Interventions in Singapore are inadequate in dispelling misconceptions and rumours regarding HIV and AIDS, which may ultimately be detrimental to public health in Singapore.

The MOH and other associated organisations like AFA should use the media most accessible and popular to Singaporeans, the television, newspapers and posters or signs being good examples, to reach out to Singaporeans and educate the public regarding

HIV and AIDS by supplying factually correct, easily understandable information to them.

The MOH should also focus on educating adolescents who are from low-income families, studying in schools that are academically less successful, and young of age, so as to achieve great efficiency and effectiveness in its AIDS health education interventions.

REFERENCES

1. Joint United Nations Programme on HIV/AIDS: <http://www.unaids.org> assessed on 20th September 2000.
2. The Sunday Times: Fight AIDS in Asia with Facts , 1 1th April 1999.
3. Adler MW. Development of the epidemic in ABC of AIDS . pp.1-6. 4th ed., Alder MW (editor), BMJ Publishing Group, 1997.
4. Ministry of Health. Press statement: continuing efforts to combat HIV/AIDS. 26 November 2001.
5. WHO. Proposed programme budget, 1998-1999. World Health Organization, regional office for the Western Pacific, Manila, June 1996.
6. Flemming DS, Visscher BR. Epidemiology and HIV transmission, in AIDS/HIV Reference guide for medical professionals . 4th Ed., pp.1-56, Fakey JL, Flemming DS (editors), Williams & Wilkins, Baltimore, 1996.
7. Muma RD, Borucki MJ. Epidemiology in HIV manual for healthcare professionals . Pp. 7-14. Muma RD, Lyons BA, Borucki MJ, Pollard RB (editors). Appleton and Lange, Norwalk, Connecticut 1994.
8. Bishop GD. Singaporean beliefs about HIV and AIDS. Singapore Medical Journal. 1996; 37:617-21.
9. Lim VKG, Teo TSH, Teo ACY, Tan KTL. HIV and youths in Singapore - knowledge, attitudes and willingness to work with HIV-infected persons. Singapore Medical Journal 1999; 40: 410-416.
10. McDermott RH, Hawkins MJ, Moore JR, Cittadion SK. AIDS awareness and information sources among selected university students. J Am Coll Health 1987; 35:222-6.
11. Cline RJW, Engel JL. College students' perception of sources of information about AIDS. J Am Coll Health 1991; 40:55-63.
12. Centers for disease control and prevention: youth risk behaviour surveillance-United States, 1997. MMWR Morb Mortal Wkly Rep 47, 1998.
13. Ministry of Health, Singapore: <http://www.gov.sg/moh/health/aidsconf98/chris/>; assessed on 20th June 2001.
14. Ministry of Education, Singapore: <http://www1.moe.edu.sg/>; assessed on 15th October, 2000.