CAN AIDS EDUCATION CHANGE SEXUAL BEHAVIOUR?

A randomized controlled trial of an AIDS education package, developed by the Medical Research Council, on high school students in KwaNdebele, South Africa

ABSTRACT

Objective: To determine if AIDS education can change the sexual behaviour of high school students.

Design: Randomized controlled trial.

Setting: Kwaggafontein. A rural township in KwaNdebele, Mpumalanga Province, South Africa.

Participants: 352 students from the three high schools in the township were allocated to study and control groups. The study group received an AIDS education package developed by the Medical Research Council of South Africa, while the control group received education on general hygiene.

Main outcome measures: Awareness of AIDS, knowledge about AIDS and self-reported sexual behaviour before and after the study.

Results: The study group showed a dramatic increase in awareness of AIDS as a problem in their community (44% to 74% P=0.00) and knowledge about AIDS as a preventable (48% to 88% P=0.00) and an incurable disease (41% to 87% P=0.00). The control group did not, that is, (49% to 43% P=0.49), (48% to 58% P=1.32) and (44% to 45% P=0.93) respectively. Most importantly, the study group showed a significant decrease in reported high-risk sexual behaviour following the AIDS education programme. Not only was there a significant increase in the reported use of condoms to prevent AIDS when sexual intercourse was anticipated (26% to 87% P=0.00), but there was a decrease in reported sexual intercourse with more than one partner (15% to 5% P=0.01) and a decrease in casual sex from 20% to 10% (P=0.03). The control group did not report significant changes in their sexual behaviour.

Conclusion: An AIDS education programme such as the one tested in this study can significantly increase awareness and knowledge of AIDS and decrease high-risk sexual behaviour. The use of this package on a national scale is highly recommended.

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Acquired immunodeficiency syndrome (AIDS) was first described as a clinical entity in 1981[1]. The causative agent — the human immunodeficiency virus (HIV) was discovered in 1984[2]. AIDS is one of the most serious conditions threatening health world-wide, with Africa being the most severely affected[3]. In South Africa, seroprevalence studies in sentinel groups such as pregnant women and blood donors have shown a rapidly rising prevalence of HIV infection[4,5], with the spread generally attributed to heterosexual transmission[6]. By June 1994, the HIV seroprevalence for the country was estimated to be about 600 000[7] and in May 1995 the figure had increased to about 1 200 000[8]. Internationally, it has been concluded that adolescent sexual activity is characterized by early onset, multiple partners and a low incidence of contraception use[9, 10, 11].

Although data on the prevalence of AIDS and HIV infection among this group are sparse, the pattern of sexual behaviour has relevance for HIV transmission, because many HIV-infected adolescents will be diagnosed only in their 20s. In spite of the fact that several studies on AIDS knowledge, attitudes and beliefs in high school students (mostly adolescents) have demonstrated general awareness about AIDS, there is concern that specific knowledge on the mode of transmission of HIV infection is lacking and riddled with misconceptions[12, 13, 14, 15]. AIDS education is therefore considered to be an important strategy in improving knowledge about AIDS, in order to limit the spread of the disease through the promotion of safer sexual behaviour[16].

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Methods

The study was carried out in Kwaggafontein, a rural township of KwaNdebele, Mpumalanga Province, South Africa, because of the high prevalence of sexually transmitted diseases (STDs) reported among the high school students and the absence of a school health programme to address issues on AIDS/STDs. Students aged 10 to 19 years from the three high schools in the township were stratified for sex and standard and then randomly allocated to study and control groups using the class numbers in the student registers. The sample size required for the study, as calculated by Donner's formula for a probability of 0.05, a power of 90%, and a clinically significant difference of 30% between study and control groups[17], was 88 students for each of the four standards (44 each for study and control groups) with a total of 352 students.

Students in both study and control groups were assembled at the beginning of the study to complete a self-administered questionnaire which assessed their awareness of AIDS, knowledge about AIDS and sexual behaviour. Thereafter, the control group received information on general hygiene from school health nurse A, while the study group received the AIDS education package developed by the Medical Research Council of South Africa, in addition to information on general hygiene by school health nurse B. The AIDS education package tested was composed of a video, a photo-novella comic book and a series of seminars. Both nurses underwent training sessions with the researcher, who was not directly involved in teaching the students on the content of the study materials used. In addition, the nurses had no prior knowledge of the students selected for the study and had no relatives amongst them.

Each session took place weekly and comprised a feedback period, topic of the day and question time. The education package was completed after five months, after which both study and control groups reassembled to complete a second self-administered questionnaire. This assessed the impact of the AIDS education programme on the awareness of AIDS, knowledge about AIDS and reported sexual behaviour. Subject bias was considerably minimized by exposing both groups to a similar pattern of events, where the only difference was the testing of the AIDS education package in the study group. All materials used by the study group were retrieved at the end of each session with strict instructions not to inform anyone outside the group, so as to minimize "contamination" of the data. This was agreed to by the study group.

The data were analyzed using EPI 6 computer programme. The proportion of the respondents in both study and control groups was compared for the various components of the questionnaires pre- and post-study and expressed in percentages. The statistical test used to detect differences between the study and control groups was the Chi-square (with Yates correction as applicable). P-values <0.05 were considered to be statistically significant.

Results

Participant characteristics

As shown in Table I, 352 students were stratified for sex and standard, then randomly allocated to study and control groups. The vast majority of the students were between the ages of 15 and 19 years, single and living with their parent(s)/guardian. There was no significant difference between the study and control groups with respect to age, sex and marital status.

Awareness of AIDS

Less than 50% of the students indicated having received any information about AIDS before the study, with a slightly lower percentage in the study group when compared with the control group;

		Study Group (n=176)	Control Group (n=176)		
Age:	10-14 years	4.5%	4.0%	x^2_c=0.00	P=1.00
	15-19 years	95.5%	96.0%		
Sex:	Male	50.0%	50.0%	x^2_c=0.00	P=1.00
	Female	50.0%	50.0%		
Marital status:					
Single and living with parent(s)/guardian		83.0%	85.8%	x^2_c=5.83, df=3,	P=0.12
Single but living with partner		16.4%	10.8%		
Married		0.6%	2.8%		
Divorced		0.0%	0.6%		

Table I: Participant characteristics

that is 43% vs 48%. Of those who indicated having received information about AIDS, only 44% in the study group and 49% in the control group were aware of AIDS being a problem in their community.

AIDS is a problem in your community	Pre-study n=75/85	Post-study n=172/95		
Study Group	44%	74%	x^2_c=19.9	P=0.00
Control Group	49%	43%	x^2_c=0.48	P=0.49 (N/S)

Table II: Awareness of AIDS

Knowledge about AIDS

The knowledge about AIDS prior to the study in both study and control groups was low. 48% in both study and control groups knew that AIDS was a preventable disease, while 41% (study group) and 44% (control group) knew that AIDS was an incurable disease. Only a negligible percentage of the students knew that other sexually transmitted diseases facilitate the spread of AIDS; that is, 3% and 5% in the study and control groups respectively.

Reported sexual behaviour

The majority of the students, that is 84% in both study and control groups, reported that they were sexually active, with over two-thirds having had their first sexual intercourse by the age of 16 years. The percentages of the students who reported having had sexual intercourse with more than one partner in the last three months preceding the study were 15% and 14% for study and control groups respectively. Slightly over a quarter of the students in the study and control groups reported the use of condoms when sexual intercourse was anticipated, or use of condoms to prevent pregnancy or AIDS. There was no significant difference between the study and control groups with respect to the reported sexual behaviour prior to the AIDS education.

Post-study

Awareness of AIDS

Following the AIDS education programme, the percentage of students in the study group who were aware of AIDS as a problem in their community increased from 44% to 74%, while in the control group there was a decrease from 49% to 43% (Table II).

Knowledge about AIDS

The knowledge about AIDS in the study group increased significantly. Those who knew that AIDS is a preventable disease increased from 48% to 88%, and that AIDS is an incurable disease increased from 41% to 87%. In the control group the difference was not significant; that is, 48% to 58% and 44% to 45% respectively (Table III). Even more striking, the percentage in the study group who knew that other sexually transmitted diseases facilitate the spread of AIDS increased from 3% to 77%. In the control group the difference was from 5% to 6% (Table III).

Reported sexual behaviour

Perhaps the most important impact of the study was the self-reported changes in sexual behaviour of the students. There was a significant decrease in the percentage of students in the study group who reported more than one partner at the end of the study, from 15% to 5%. In contrast, the control group reported an increase from 14% to 17%. There was a significant decrease in reported casual sex, defined as sexual intercourse with a partner known less than seven days at last sexual intercourse, in the study group (from 20% to 10%), but not in the control group (from 18% to 15%). The percentage in the study group who reported the use of condoms when sexual intercourse was anticipated increased from 25% to 83%, to prevent pregnancy from 25% to 83% and to prevent AIDS from 26% to 87%. The changes in the control group were not significant (Table IV).

Discussion

In the absence of a cure or vaccine for AIDS, health education campaigns advocate changes in sexual practices in an attempt to reduce HIV transmission[18]. Quantitative data on sexual behaviour in Africa are sparse and such data are relevant to an epidemiological understanding of AIDS and to efforts to check HIV infection[19]. In South Africa, most of the studies on AIDS have focused on the knowledge, attitudes and beliefs about AIDS, with very little information on the impact of AIDS education on the sexual behaviour of people. Therefore, this study is one of the earliest in South Africa to measure the impact of AIDS education on the reported sexual behaviour of high school students.

The decision to use self-administered questionnaires may give rise to some concern on how valid the responses of the students were, in terms of accuracy and honesty. By its very nature, risky sexual behaviour is private behaviour and under-reporting of high risk sexual behaviour may arise out of fear of being exposed and the subsequent embarrassment that may follow. In particular, the study group may have felt compelled to under-report high-risk sexual behaviour following their exposure to the AIDS education programme. Hopefully the results indicate that informal choices based on awareness and knowledge of AIDS represent a true reflection of the impact of the AIDS education programme. However, every effort was taken to ensure confidentiality by ensuring the anonymity of the respondents and their responses.

Over-reporting arises out of the awareness of their participation in the study, which in itself produces the desired change — "Hawthorne effect"[20]. This bias was also markedly reduced by having an identical control group which was exposed to a similar pattern of events as the study group, and in which very little change was reported. Several techniques were employed to make it less likely that the students minimized or exaggerated reports of their sexual experiences:

(a) code numbers rather than names were used on the questionnaires;
(b) the researcher was not involved in any way with the administration of the questionnaires;
(c) the importance of responding honestly was emphasized; and
(d) participants were assured that their responses would be kept confidential.

Results

Awareness of AIDS

The study group reported a significant increase in awareness of the existence of AIDS as a problem in their community after the study, while the control group did not. This finding points to the fact that this AIDS education programme addressed the fact that AIDS is a problem that affects every community to varying degrees. The lower percentage of the control group that was aware of the disease in their community shows that whatever the messages about AIDS in the country, these had not helped people to perceive the disease as a problem within their communities. This is supported by Mathews et al[12], in which 52,6% of their respondents believed that people in other parts of South Africa had AIDS and not themselves.

	Pre-study n=75/85	Post-study n=172/95		
AIDS is a preventable disease				
Study group	48%	88%	x^2_c=44.63	P=0.00
Control group	48%	58%	x^2_c= 1.32	P=0.25 (N/S)
AIDS is an incurable disease				
Study group	41%	87%	x^2_c=51.94	P=0.00
Control group	44%	45%	x^2_c= 0.01	P=0.93 (N/S)
Other STDs facilitate the spread of AIDS				
Study group	3%	77%	x^2_c=112.51	P=0.00
Control group	5%	6%	x^2_c= 0.02	P=0.88 (N/S)

Table III: Knowledge about AIDS

	Pre-study n=147	Post-study n=149/151		
% Who had sexual intercourse with >1 partner in last 3 months				
Study group	15%	5%	x^2_c=6.47	P=0.01
Control group	14%	17%	x^2_c=0.15	P=0.70 (N/S)
% Who had sexual intercourse with a partner known <7 days at last sexual encounter				
Study group	20%	10%	x^2_c=4.72	P=0.03
Control group	18%	15%	x^2_c=0.53	P=0.47 (N/S)
% Who used condoms when sexual intercourse was anticipated				
Study group	25%	83%	x^2_c=100.42	P=0.00
Control group	25%	28%	x^2_c=0.27	P=0.60 (N/S)
% Who used condoms to prevent pregnancy				
Study group	25%	83%	x^2_c=98.2	P=0.00
Control group	29%	34%	x^2_c=0.71	P=0.40 (N/S)
% Who used condoms to prevent AIDS				
Study group	26%	87%	x^2_c=111.71	P=0.00
Control group	33%	33%	x^2_c=0.00	P=1.00 (N/S)

Table IV: Reported sexual behaviour

Knowledge about AIDS

The knowledge that AIDS is both a preventable and an incurable disease increased significantly in the study group from 48% to 88% and from 41% to 87% respectively. This was not unexpected, as the AIDS programme was designed with input from adolescents which made it more acceptable and appropriate for them to understand. In a Djibouti study[21], a remarkable feature was the much better understanding of AIDS among the 18-year-old students who received special lectures on AIDS as part of a national campaign a month previous to the study — illustrating the positive impact of AIDS education on knowledge about the disease. The dramatic increase in the percentage of the students in the study group who knew by the end of the study that other STDs facilitate the spread of AIDS further strengthens the positive impact of the AIDS education programme on the knowledge about AIDS.

Reported sexual behaviour

AIDS education programmes directed at educating high school students about safer sexual behaviour are yet to be implemented nationally in South Africa. But the findings of this study on the self-reported sexual behaviour of high school students are very encouraging, given the widely recognized potential risk of sexually transmitted diseases, including AIDS, in this target group.

One common argument against AIDS education programmes for adolescents has been that exposing them to information about AIDS/sex will encourage them to engage in sexual activity[22]. On the contrary, data from this study on the self-reported sexual behaviour provide evidence that the opposite is likely to be the case. The study group reported a significant decrease in high-risk sexual behaviour at the end of the study. This was demonstrated by the decrease in the percentage who reported having had sexual intercourse with more than one partner and having had sexual intercourse with a partner known less than seven days at last sexual intercourse. These findings are even more significant when compared with those of the control group in which the percentage who reported having had sexual intercourse with more than one partner increased slightly. Analyses of other data on the self-reported sexual behaviour of the students revealed that the study group engaged in less risky sexual behaviour at the end of the study. The reported use of condoms to prevent pregnancy or AIDS dramatically increased when sexual intercourse was anticipated.

These findings are supported by a study done in the United States of America, which found an association between AIDS education and (i) increase in the consistency of condom use and (ii) decrease in the frequency of sexual intercourse and in the number of sexual partners among adolescents[23]. AIDS knowledge was also found to be positively correlated with behavioural change in an earlier study of inner city school students[24]. These results cannot be explained as a simple result of any special attention received by the study group, as both study and control groups were given equal attention and had to undergo a similar pattern of events. HIV is transmitted to a large extent by behaviour that can be modified through educational programmes. Therefore, AIDS education should not be seen as mere transmittal of knowledge, but also as having persuasive and motivational properties to effect change in sexual behaviour, especially when properly designed with input from the intended target group.

This study has demonstrated that AIDS education can promote change in the sexual behaviour of high school students towards low-risk sexual behaviour. It also demonstrates that the school is an ideal place to impart this knowledge, as more adolescents can be reached in this setting.

Conclusion

An AIDS education programme, such as the one tested in this study, can significantly increase awareness and knowledge of AIDS. It can also decrease self-reported high-risk sexual behaviour in high school students through the increased use of condoms and a decrease in the number of sexual partners. ●

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