EFFECTIVENESS OF A HEALTH EDUCATIONAL PACKAGE FOR AIDS PREVENTION AMONG ADOLESCENT SCHOOL CHILDREN

Brig VW TILAK*^{VSM}, Lt Col RAJVIR BHALWAR⁺

ABSTRACT

A randomised, controlled, community based intervention trial was undertaken to assess the effectiveness of a Health Education Programme (HEP) for HIV infection and AIDS among school children at Pune. Sample size was calculated on the basis of conventional Type I and Type II errors. School children studying in classes 9th to 12th in six different schools (n=1102) formed the study material. Baseline assessment for knowledge for AIDS/HIV was undertaken and used for formulating the Health education Programme Package. Randomisation was done so as to allocate five schools into trial group (n=803) and one school into control group (n=299). Blinding was also ensured to reduce bias. The study revealed that the HEP was very effective in improving the knowledge, the difference being highly significant as compared to control group. The effect was specially well marked for girls in school level (OR=4.76) followed by boys intermediate level (OR=3.11); there was clear evidence of statistical effect modification as regards this 'sex and educational class' differential (Woolfs'chi square=11.82, $p < 0.0001$). The study also revealed that the maximum acceptability of programme was among girls studying in girls school (Stratum OR =2.25) followed by boys in boys school (OR=1.50) compared to students in co-educational system (linear trend chi square=9.35, $p < 0.01$). Certain recommendations for health education for HIV/AIDS among school children have been submitted.

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KEY WORDS: AIDS; Health education; Randomised controlled trial.

Introduction

Acquired Immuno-Deficiency Syndrome (AIDS), is one of the most devastating calamities let loose on mankind by nature. The infection is spreading all over the world, breaking all socio-cultural and geographical barriers. There are an estimated 14 million people infected with HIV. this figure is likely to swell upto 30 to 40 million by the year 2000 A.D. [1]. India will also have its own major share of this misery-by 1996 it is projected that there will be 2 to 3 million HIV infected persons and 179 thousand AIDS cases, [2] with one new HIV positive individual being added every 15 seconds [3].

The tragedy of HIV infection and AIDS is further compounded as there is neither any vaccine, nor any cure likely to be available. With this handicap, only weapon for significantly reducing the spread of this infection is "health education", for ensuring a change in behaviour and life style [4].

About 30% of the world's population is in the age group 10 to 24 years [5]. More than one fifth of the cases of HIV infection reported to Centres for Disease Control (CDC) U.S.A. are in the age group of 20 to 29 years. Considering the latent period, it is quite possible that most of these cases would have acquired the infection during their teens [6]. In fact young persons in the schools have been identified as one of the groups

in special need of HIV/AIDS health education [7] for the very reason that adolescence is a period when the young individual undergoes profound physical and psychological changes, with a desire to challenge authority and experiment with sex and drugs, thus making them extremely vulnerable to this infection. In addition, it is easier to influence their sexual behaviour, since such behaviour has just started forming. Moreover, the school settings provide an excellent opportunity to educate this group [8].

It was against this backdrop that the present study was taken up.

Methods

The study design was undertaken in schools located in a large prototype cantonment of Indian Armed Forces, consisting of six different schools located in the study area, two each of the schools being co-educational, only for boys, and only for girls. All students in classes IX to XII formed the sample. The study was for two years from April 1993 onwards.

Sample size was calculated using the conventional alpha and beta error levels. Thus aiming at a power of 80% to detect a real difference. With the expected proportion of children having adequate knowledge at baseline at around 50% ($p=0.5$) and with a view to detect at least 25% improvement in knowledge over the baseline level as meaningful from public health point of view, the minimum sample size worked out to be at least 275 in each of the control and intervention groups. A much larger sample size of 299 among control group and 803 among the trial group was actually studied, thus improving the precision of the study. Permission for ensuring the co-operation of the school authorities was solicited.

* DDMS, HQ 2 Corps, C/o 56 APO, ⁺ Reader, Department of PSM, Armed Forces Medical College, Pune 40

Randomisation was done at the school level using a lottery system. One of the schools served as the control group and the remaining five schools as the trial group.

The worker who was administering the health education package was different from the worker who checked and gave marks on the pretest and post test questionnaire. The codes were handled by the third worker.

A questionnaire was designed pretested and standardised in a pilot study on 82 subjects, to test the knowledge about various aspects of HIV/AIDS. The questionnaire was administered to all the subjects at the start of the study, for making a baseline assessment, after explaining the scope of the study and assuring confidentiality. Each correct answer was given 1 mark, each wrong answer minus half mark, and every "do not know" answer was given zero.

Intervention was a "Health Education Programme" consisting of overhead projection transparencies, an exhibition, a video film and an "open-house" question answer session.

Post test was done, using the same questionnaire, after a gap of about two months following the HEP. This gap of two months gave adequate "wash-out" period for both the groups. The post test was given to children of both; the Intervention as well as Control Groups and the marking was done in the same way as for pre-test evaluation. An increase of 25% or more marks over the baseline marks was taken as criteria for "adequate improvement".

Results

Baseline level of knowledge

It was observed that 51.8% of the trial group and 46.8% of the control group scored 50% or more marks in the questionnaire used for baseline assessment of knowledge regarding HIV infection and AIDS (Table 1). The 2 groups were comparable as there was no significant difference between them.

TABLE 1

Comparison between trial and control groups regarding baseline level of knowledge

Marks obtained in baseline assessment of knowledge	Trial group No. (%)	Control Group No. (%)	Total No. (%)
Less than 50%	307 (48.2)	159 (53.2)	546 (49.5)
50% or more	416 (51.8)	140 (46.8)	556 (50.5)
Total	803 (100%)	299 (100%)	1102 (100%)

$\chi^2 = 2.16$, $df = 1$, $p > 0.05$

Knowledge about HIV/AIDS and common misconceptions

The educational content of the HEP was built up based on the existing knowledge about HIV and AIDS, and the common misconceptions that the children had about this infection, at the baseline, i.e. before starting the intervention. This assessment was done for the entire study subjects, before they were randomly allocated into trial and control groups (Table 2).

It was observed that more than 80% of the children were aware of the important modes of transmission and the non availability of any vaccine or treatment. However preventive measures like avoiding promiscuous sexual intercourse or use of condoms were less well known.

A number of children also had misconceptions about various aspects of HIV/AIDS, viz.

TABLE 2

Level of knowledge regarding HIV infection and AIDS among study children at baseline

Broad aspect of HIV infection and AIDS	Aware		Not aware	
	No.	%	No.	%
Transmission by promiscuous sexual intercourse	925	(83.9)	177	(16.1)
Transmission by contaminated blood	934	(84.8)	168	(15.2)
Transmission by contaminated syringes/needles	883	(80.1)	219	(19.9)
Causation by a microbe	765	(69.4)	337	(30.6)
Prevention of promiscuous sexual intercourse	792	(71.9)	310	(28.1)
Prevention by use of condoms	598	(52.3)	504	(47.7)
Non availability of vaccine	894	(81.1)	200	(18.9)
Absence of treatment	872	(79.1)	230	(20.9)

-transmission through bite of mosquitoes/bed bugs	337	(30.6%)
-contact with saliva of an infected person	695	(63.1%)
-sitting in the same class room or staying in the same house with infected person	173	(15.7%)
- by donating blood we can get HIV	111	(10.5%)
- by playing with an HIV infected person	234	(21.2%)
- possession by evil spirit	111	(15.5%)

Sources of background knowledge among students

The various sources of background knowledge among students at the time of baseline evaluation are presented in Table 3. The total of the columns are much more than the actual number of boys and girls since most of the children mentioned more than one source of information.

TABLE 3

Sources of background information among students

Source of information about HIV/AIDS	Boys		Girls		Total	
	No.	(%)	No.	(%)	No.	(%)
Television	440	(26.1)	540	(31.8)	980	(28.1)
Magazine/newspaper	379	(22.5)	351	(20.6)	730	(21.6)
Friends	328	(19.5)	253	(14.9)	582	(17.2)
School education	171	(10.2)	199	(11.7)	370	(10.9)
Doctors (at clinics, hospitals)	156	(9.3)	105	(6.2)	261	(7.7)
Parents	83	(4.9)	168	(9.9)	251	(7.4)
Other methods	126	(7.5)	85	(5.0)	211	(6.2)
Total	1684	(100)	1701	(100)	3385	(100)

$\chi^2 = 69.95$, $df = 6$, $p < 0.001$

It was observed that overall, television was the commonest source of information (28.9%). The three sources, viz. television, magazines/newspapers and friends together accounted for more than 2/3rds of all the sources. More of the girls obtained their information from television (31.8%) compared to boys (26.1%). the difference was highly significant ($p < 0.001$).

Overall effectiveness of Health Education Programme

The overall effectiveness criteria for "adequate improvement" was at least 25% improvement in the marks over the baseline level of marks. The HEP was very effective (Table 4), with 64.6% in the trial group showing improvement compared to only 33% in the

control group, the difference being highly significant ($p < 0.001$), with an Odds Ratio (OR) of 3.69. It was evident that the probability of child showing adequate improvement in knowledge was almost 3.7 times higher when the HEP is given.

TABLE 4

Overall effectiveness of health education programme

Improvement in knowledge over baseline level	Trial group		Control group		Total	
	No.	(%)	No.	(%)	No.	(%)
Improvement	519	(64.6)	99	(33.1)	618	(56.1)
No improvement	284	(35.4)	200	(66.9)	484	(43.9)
Total	803	(100)	299	(100)	1102	(100)

$\chi^2 = 87.9$; $df = 1$; $p < 0.001$

Role of sex differential on effectiveness of HEP

While the overall effectiveness of HEP was 3.7 times more, the study further proceeded to assess as to whether sex of the children (boys or girls) is likely to have an impact on the effectiveness (Table 5). The effectiveness of the HEP was lower in boys, the stratum OR for boys being 2.79; compared to the stratum OR for girls which was 4.59. Thus there is a clear "epidemiological effect modification", with girls likely to benefit almost 4.6 times, while boys are likely to benefit by about 2.8 times with the HEP.

Role of sex and the standard of education in the effectiveness of HEP

The study further proceeded to assess, as to whether sex, along with the educational standard may act as an important determinant of the effectiveness of HEP. Stratified analysis was undertaken on the basis of four strata, viz. boys in high school classes (IX and X), girls in high school classes, boys in intermediate classes (XI and XII) and girls in intermediate classes (Table-6).

The best results are seen in the respect of girls in school levels (IX and X) among whom with an OR of 4.76, the HEP is likely to be almost 4.8 times effective as compared to when HEP is not given. Next in the order of effectiveness are boys in intermediate level (XI and XII) in which the effectiveness is 3.1 times ($OR=3.11$). On the other hand the effectiveness is much lower among girls of Intermediate level ($OR=2.33$) and boys of high school level ($OR 2.77$). It therefore gives us an indication that the target audience for HIV/AIDS education are girls studying in high school levels and boys studying in intermediate levels. A significant woolfs test confirmed that such effect modification was, indeed, present.

Acceptability of the Health Education Programme

Acceptability of the HEP could be ascertained only from the

TABLE 5

Effect of sex on the effectiveness of health education

Adequate improvement (26% Increase over baseline marks)	Stratum - I boys			Stratum - II girls		
	Trial group	Control group	Total group	Trial group	Control group	Total group
	No.	No.	No.	No.	No.	No.
	(%)	(%)	(%)	(%)	(%)	(%)
Achieved	193 (55.8)	48 (31.2)	241 (48.2)	326 (71.3)	51 (35.2)	377 (62.6)
Not achieved	153 (44.2)	106 (68.6)	259 (51.8)	131 (28.7)	94 (64.8)	225 (37.4)
Total	346 (100)	154 (100)	500 (100)	457 (100)	145 (100)	602 (100)

$\chi^2 = 25.85$, $df = 1$, $p < 0.001$

$\chi^2 = 61.50$, $df = 1$, $p < 0.001$

TABLE 6

Stratified analysis of the effect of sex and educational standard on effectiveness of HEP

Adequate improvement	Trial group		Control group		Total group	
	No.	(%)	No.	(%)	No.	(%)
Boys IX and X						
Achieved	134	(54.3)	21	(30.0)	155	(36.3)
Not achieved	113	(45.7)	49	(70.0)	162	(63.7)
Total	247	(100)	70	(100)	317	(100)
Girls IX and X						
Achieved	301	(73.2)	27	(36.5)	320	(67.6)
Not achieved	110	(26.8)	47	(63.5)	157	(32.4)
Total	411	(100)	74	(100)	485	(100)
Boys XI and XII						
Achieved	59	(59.6)	27	(32.1)	86	(47.0)
Not achieved	40	(40.4)	57	(67.9)	97	(53.0)
Total	99	(100)	84	(100)	183	(100)
Girls XI and XII						
Achieved	25	(54.3)	24	(33.8)	49	(41.9)
Not achieved	21	(45.7)	47	(66.2)	168	(58.1)
Total	46	(100)	71	(100)	117	(100)

trial group as the control group did not get the HEP. Overall acceptability of the programme was 78% among children. Interestingly, the lowest acceptability was 66.7% in boys as well as girls among co-educational school. On the other hand 75.1% boys in the boys' school accepted the programme while as high as 81.9% girls in the girls school accepted the programme. As is evident from the Stratum specific odds ratios, as compared to boys or girls who were studying in co-educational schools, boys studying in boys school accepted the HEP by one and a half times and girls in girls school accepted it by 2.25 times ($p < 0.01$) (Table-7).

Discussion

The baseline assessment brings forth the lacunae that are existent in the status of knowledge regarding HIV/AIDS among adolescents who are likely to start their sexual life after just a few years. In particular, a large proportion are unaware about its causation by a microbe and its prevention through avoidance of promiscuous sex or through use of condom. In addition a large number have misconceptions regarding this disease. The findings are thus comparable in general, with those of Seltzer et al [9] and Diclemente et al [10]. Similarly, misconceptions regarding transmission by mosquito bites have been reported by Kaul et al [11] and Walrond et al [12] while Goodman et al [13]

TABLE 7

Acceptability of health education programme according to sex and system of schooling - linear trend analysis

Acceptability of programme	Boys in co-ed school		Girls in co-ed school		Boys in boys school		Girls in girls school		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Acceptable	6	(66.7)	32	(66.7)	253	(75.1)	335	(81.9)	626	(78)
Not acceptable	3	(33.3)	16	(33.3)	84	(24.9)	74	(18.1)	177	(22)
Total	9	(100)	48	(100)	337	(100)	409	(100)	803	(100)

Chi square = 9.3, df = 1, $p < 0.01$

reported that a number of young persons had misconceptions regarding the infectivity of saliva.

The findings of the present study indicate that a properly designed health education programme is clearly and significantly effective in bringing about a quantifiable and demonstrable improvement in the knowledge regarding HIV/AIDS among school children. The effectiveness is maximum among younger girls (High school level) and slightly older boys (Intermediate level). This is possibly because of the physiological reasons as a result of which girls tend to become physically as well as psychologically mature at an earlier age. The target group therefore should be girls who are studying in IX and X classes and boys who are studying in XI and XII classes for obtaining best results.

This study forwards the findings that the acceptability of an AIDS education programme is higher among the unisex system of schooling as compared to co-educational system of schooling. This may be due to the reasons that the very subject is quite sensitive and may embarrass boys and girls sitting together in the same classrooms or school but may have better impact when the schools are exclusively for girls or boys. However, it has been observed in the present study that, in general the acceptability of HEP is quite high both among the students as well as the school administrators and the common feeling, that resistance may be encountered (HIV/AIDS being a sensitive issue) is unfounded.

The workers recommend that the simple, inexpensive and practicable Health Education Programme (HEP), developed and studied in the present work and whose effectiveness has been demonstrated herewith, through a Randomized Controlled Community trial, may be considered for providing education of HIV/AIDS to school children, targeting the programme to girls of school level and boys of intermediate level.

There is a need to incorporate HEP on HIV/AIDS which should be made compulsory by introducing this

subject in the academic curriculum of the school students from Standard IX to standard XII. This simple procedure is likely to produce rich dividends in the long run towards the goal of prevention and control of HIV/AIDS.

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