

Efficacy of HIV/AIDS Related Educational Package on Awareness and High-Risk Behavior of Adolescent Students in Kathmandu Metropolitan City

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Abstract

Introduction: Human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) are among the most complex health problems of the 21st century. Young people aged 15 - 24 years are the HIV/AIDS at risk group. The objective of this study was to evaluate the effectiveness of an educational interventional program on knowledge on HIV/AIDS among adolescent students of higher secondary school in Kathmandu, Nepal. **Methods:** The study was the pre test - post test experimental study design with an experimental and a control group conducted in the randomly selected eighteen higher secondary schools. The intervention, educational package on HIV/AIDS, was provided to all grade twelve students in the intervention group from 1st September, 2017 to 2nd January, 2018. In total, 321 from the intervention group, and 283 from the control enrolled at baseline and over 95% of these were followed up at posttest. The data were collected from self-administered questionnaires in English version and analyzed by using independence t-test and paired t-test. **Results:** Overall pretest knowledge of both intervention and control groups was comparable with 27.58 ± 4.05 and 28.53 ± 3.77 mean \pm standard deviation respectively. But statistical analysis showed significant higher knowledge ($P = 0.03$) among control group. After the educational intervention, the mean knowledge score of control group increased by only 0.47, whereas the same score increased by 11.57 and reached 39.15 ± 3.7 in post-test for intervention group. The difference in post-test score was statistically highly significant ($P < 0.001$). The finding indicates that the educational intervention was effective in changing the HIV/AIDS knowledge

of students of intervention group. The differences in pre- and post-test knowledge scores of both intervention and control groups were statistically significant with P-value of 0.000 and 0.003 respectively. The findings of sexual risk behavior showed that 6.7% of controls and 16.8% of intervention group students reported having sexual relations. **Conclusion:** Educational intervention was efficacious in improving awareness of adolescent students on HIV/AIDS. The study has also indicated that remarkable numbers of adolescents are practicing high risk behavior for HIV/AIDS like having early initiation sexual intercourse, multiple sex partners, using alcohol before intercourse etc. There is need to promote education program among higher secondary schools to multiply the effects of providing opportunities to equip students with factual information on HIV/AIDS.

Keywords

Adolescents, Educational Intervention, HIV/AIDS

1. Introduction

Human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) are among the most complex health problems of the 21st century [1]. Young people (15 - 24 years old) are of international concern in the HIV/AIDS epidemic and are labelled “at risk” group. The importance of focusing on young people recognized at a global level by the 2002 United Nations General Assembly Special Session [2]. AIDS is a disease that in terms of its social problems, incidence and prevalence in active ages of society, high fatality rate and the cost of intensive care is considered among the main problems of the health care system; and control, prevention and care of patients are among the main activities that the health care institutions provide worldwide for this disease [3].

Globally, up to the end of 2014, 36.9 million people were living with HIV and 2 million people became newly infected. Over half of all new infections worldwide are among young people between the ages of 15 and 24 [4]. Adolescents aged 10 - 19 years of age accounting for nearly 22% of the population of Nepal are exposed to the risk of being victims of HIV/AIDS [5]. In Nepal, 13% of all HIV cases are adolescents aged 14 - 19 years [6].

As a transitional step from children to adulthood, adolescence is a crucial period for fostering healthy attitudes and behaviors to protect people from diseases [1]. Studies have reported that co-existence of high risk behaviors, particularly unsafe sexual behavior, and influence of mass media on the perception of sex, degradation of traditional value, together with inadequate knowledge and major misconceptions related to HIV/AIDS, contributes young people to increased vulnerability to HIV infection [7] [8] [9]. Thus, fostering healthy behaviors among adolescents may be more essential for the prevention of HIV/AIDS and high-risk behaviors in the general population [1]. In addition, their opinions, at-

titudes, and behaviors play a critical role in constructing a compassionate social environment free from discrimination for people living with HIV and AIDS [10].

Researches carried worldwide have shown that school-based education can serve as a powerful preventive tool for HIV/AIDS prevention activities [11] [12]. There is further evidence that HIV/AIDS education does not result in an earlier age of sexual debut, and in fact, it may delay the initiation of sexual activity and encourage use of protective behavior upon sexual initiation [12] [13]. In Nepal, schools are the primary locations where young people acquire knowledge, awareness and skills. School-based HIV/AIDS health education can be more efficiently delivered than other programs that help prevent the spread of AIDS. The objective of this study was to evaluate the effectiveness of an educational interventional program on knowledge and risk-behavior on HIV/AIDS among higher secondary school students in urban area of Kathmandu city, Nepal.

2. Methods

2.1. Study Design

The study consisted of pre test - post test experimental design with an experimental group and a control group using a self-administered questionnaire for both gender. The educational intervention provided to the experimental group was a brief one hour session and the study had a follow-up time of 3 months.

2.2. Study Site and Population

The study was conducted in the Kathmandu from 1st September, 2017 to 2nd January, 2018. It is the capital city of Nepal with a population of 1.5 million in the city proper [14]. The Kathmandu city was selected as research site because it is one of the urban and the largest metropolitan area that is likely to be the center of an epidemic. Among 257 higher secondary schools (HSS), 18 HSS, located and dispersed widely within Kathmandu Metropolitan City, were randomly selected and assigned, to either intervention or control group (9 in each). After being informed about the purpose of the study, all of 18 HSS agreed to participate. The experimental and control schools were similar with respect to curricula and organization, and average number of students per class. One section of class 12 of each school was selected with the lottery method. The population was adolescent students studying in class 12 of HSS. No other selection criteria were set for selecting the students. The students of the selected schools were informed of the purpose of the study before the intervention and a consent letter was given to all of them. Finally, all of the students of selected classes agreed to participate in the study.

2.3. Pre Test

A self-administered questionnaire was distributed to all the students of both intervention and control group for assessing their baseline knowledge and

high-risk behavior regarding HIV/AIDS and collected back.

2.4. Health Education Intervention

The health education intervention module on HIV/AIDS was developed through the consultations with the experts in HIV/AIDS. Participants of experimental groups received a single session of HIV/AIDS class by trained teachers. The intervention consisted of single sessions for each class, each of 60 minutes duration which focused on basic facts about HIV/AIDS, epidemic situation in Nepal, and all over the world, transmission and non-transmission modes, high-risk behaviors, misconception related to HIV/AIDS, preventive measures, and availability of treatment. Medium of instruction was Nepali and English and power point slides along with charts were used as teaching aids. The control group was not given any intervention. Snacks were provided to all participants of both intervention and control group.

2.5. Post Test Evaluation

After a period of 3 months, a post test questionnaires were administered among the same students using the same questionnaire used for pre test. A lag period of 3 months was given after the health education, to assess the long term memory of the participants. After collecting back the filled questionnaire, a doubt clearance session was arranged for reinforcing the knowledge.

2.6. Ethical Considerations

The permission for conducting the research was obtained from the Institutional Review Board, Tribhuvan University, Institute of Medicine before commencement of the study. The research steps were explained and formal permission was obtained from the administration of selected 18 HSS. Informed written consent was also obtained from each respondent before data collection.

2.7. Randomization Procedure

The list of all names of HSS of the Kathmandu Metropolitan City served as the sampling frame. Participants were not aware of group assignment (single blind). The names of schools were randomly selected from the sampling frame of 257 HSS located within the Kathmandu Metropolitan City. The selected 18 HSS were randomly assigned using a computer generated table of random numbers into intervention and control groups (9 HSS in each group).

2.8. Sample Size Calculation

The sample size was calculated using odds ratio between the knowledge of experimental and control group of similar study done in Malaysia as 0.07 by Ibrahim, Rampal, Jamil, & Jain (2012); assuming attrition rate of 20%, the calculated sample size for this study was 604. Total sample included in this study were 604 students aged 15 to 20 years. Eleven and twenty-one students dropped (total-5.29%)

from the post test from the intervention and control group respectively. Thus, the final sample size comprised of 572 students (310-intervention; 262-control) from both groups.

2.9. Data Collection Procedures

Data collection was carried out in the period 1st September, 2017 to 2nd January, 2018. A validated self-administered printed questionnaire was used as the test instrument among the both group. The questionnaire consisted of three main sections that required approximately 25 - 30 minutes to complete. A total of 604 students completed the test before the intervention, and 572 students were successfully followed up after the intervention. Questionnaires were handed out and collected by teams of researchers and trained research assistants in the class during school hours. Data were collected at baseline and 3 month's post-intervention.

2.10. Instruments

The test instrument was developed on the basis of literature review and HIV/AIDS/STD behavioral surveillance survey (BSS) questionnaire for youth [15]. The HIV-related knowledge questionnaire consisted of 34 items with "true" and "false" options. The responses were coded as 1 for a correct response and 0 for an incorrect or "false" response. Higher scores indicate accurate views on HIV/AIDS in this study. The questionnaire was developed into English languages. All questions were validated regarding language and comprehension of questions by a pre test study among the same population. The 3 parts of the questionnaire consisted of: 1) socio-demographic questions (8 questions on age, sex, address, ethnicity, religion and father's education and mother's education), 2) HIV/AIDS Knowledge (34 statements on HIV/AIDS transmission modes, non-transmission modes, prevention, treatment) and 3) HIV/AIDS-related Risk Behavior (13 questions on sexual exposure, sexual partner, condom use, and abuse of drug). The tests before and after the intervention were the same questionnaire, however, the students were not required to fill out the part on high-risk behaviors after the intervention test.

2.11. Statistical Analysis

Data were entered in, and analyzed using the Statistical Package for Social Sciences software (SPSS) version 16.0. Descriptive analysis was done on the socio-demographic characteristics and measured the rate of HIV/AIDS knowledge awareness. Pre intervention and post intervention knowledge scores of students were analyzed using paired t-test using SPSS and a p-value of less than 0.05 was considered as statistically significant.

3. Results

This study was done among 604 students. The mean age of respondent of inter-

vention group was 17.42 ± 1.070 years and control group was 17.06 ± 0.873 years. Majority were of age group 15 - 17 years in both intervention group (53.3%) and control group (71.0%). Female population was dominant in both groups (51.4% and 53.4% respectively). Majorities were from control (68.6%) and intervention (78.8%) group were migrant in the valley. Nearly half of respondents (46.4% and 47.3%) were Brahman and Chhetri. Similarly, Hinduism was most followed (85.4% and 84.1%) in both groups. Majority (54.7% and 62.5%) lived with their parents. Furthermore, 40.5% and 36.7% mothers of respondents had studied eight class or less in intervention and control group respectively, 37.4% and 39.2% fathers of respondents from intervention and control group had higher secondary education (**Table 1**).

In the pretest and posttest knowledge results of both control and the intervention group, majority of the control group respondents knew the cause, transmission and non-transmission routes of HIV/AIDS. It shows that there is nominal increase in between the pretest and posttest knowledge of the control group. Regarding the basic knowledge of AIDS in pre-test of the intervention group, majority (87.2%) replied correctly on cause, 96.6% said sexual intercourse as a main transmission route, 80.4% replied hugging as a non transmission route. Regarding intervention group's response on posttest, it shows that most of the respondents of intervention group gave the correct response on the cause, transmission and non-transmission routes of HIV/AIDS during post test. It shows that there is increase in the knowledge after the post test of the intervention group ranging from 3.4% (main mode of transmission) to 44.5% (full form of AIDS) (**Table 2**). Majority of the control group respondents were known about the risk group of HIV/AIDS. Whereas regarding other variables, 73.1% said weight loss as major sign, more than half answered correctly on preventive measures and nearly half were known about the treatment of HIV/AIDS. There is minimal change in post test knowledge among control group.

Regarding the knowledge of risk group in pre-test of the intervention group, majority (85.0%) identified multiple sex partners as main risk group. 68.5% said being faithful is the effective measure to prevent HIV/AIDS, and more than one third replied correctly about the treatment of HIV/AIDS. Regarding intervention group's response on posttest, most of the respondents of intervention group gave the correct response on risk groups, sign and symptoms, prevention and treatment of HIV/AIDS during post test. It shows that there is increase in the knowledge after the post test of the intervention group ranging from 15.0% (high risk for multiple sex partners) to 50.8% (prolonged diarrhea as sign) (**Table 3**).

The pre-test knowledge score of intervention and control groups shows that the baseline knowledge is significantly higher (0.03) in the control group than in the intervention group (**Table 4**). The post-test knowledge score of intervention and control groups. It shows that posttest knowledge score is significantly higher ($p < 0.001$) in the intervention group than the control group as tested by Independent sample "t" test (**Table 5**). The mean and SD of control group at pre-test

Table 1. Adolescents' socio-demographic characteristics.

Characteristics	Intervention group (n = 321)		Control group (n = 283)		Total (n = 604)
	n	%	N	%	n (%)
Age (in years)					
15 - 17	171	53.3	201	71.0	372 (61.58)
18 - 21	150	46.7	82	29.0	232 (38.42)
Mean age ± SD	17.42 ± 1.070		17.06 ± 0.873		
Gender					
Male	156	48.6	132	46.6	288 (47.68)
Female	165	51.4	151	53.4	316 (52.32)
Marital Status					
Married	5	1.6	3	1.1	8 (1.32)
Single	316	98.4	280	98.9	596 (98.68)
Residence					
Inside valley	68	21.2	89	31.4	157 (26.0)
Outside valley	253	78.8	194	68.6	447 (74.0)
Ethnicity					
Brahman & Chhetri (parbatiya)	149	46.4	134	47.3	283 (46.86)
Brahman & Chhetri (terai/madhesi)	46	14.3	23	8.1	69 (11.42)
Dalit	12	3.7	8	2.8	20 (3.3)
Janajati	69	21.5	54	19.1	123 (20.36)
Newar	24	7.5	61	21.6	85 (14.07)
Others	21	6.5	3	1.1	24 (3.98)
Religion					
Hindu	274	85.4	238	84.1	512 (84.8)
Buddhist	32	10.0	37	13.1	69 (11.42)
Muslim	2	0.6	1	0.4	3 (0.50)
Christian	13	4.0	7	2.5	20 (3.31)
Person with whom participant live					
Parents	175	54.5	177	62.5	352
Brother/sister	85	26.5	50	17.7	135
Friends	11	3.4	5	1.8	16
Relatives	36	11.2	23	8.1	59
Others (Hostels)	14	4.3	28	9.9	42
Education of Mother					
No formal education	107	33.3	76	26.9	183
8 or less (Primary)	130	40.5	104	36.7	234
Higher secondary	69	21.5	74	26.1	143
Bachelor and above	15	4.7	29	10.3	44

Continued

Education of Father					
No formal education	33	10.3	33	11.7	66
8 or less (Primary)	100	31.2	76	26.8	176
Higher secondary	120	37.4	111	39.2	231
Bachelor and above	68	21.1	63	22.2	131

Table 2. Adolescents' knowledge on HIV/AIDS.

Outcome measures/Variables	Cont. Group		Increase in knowledge (%)	Int. Group		Increase in knowledge (%)
	Pre test	Post test		Pre test	Post test	
Basic knowledge						
Full form of AIDS	16.6%	17.6%	1.0	12.5%	52.6%	40.1
Full form of HIV	18.7%	17.9%	-0.8	16.8%	61.3%	44.5
AIDS is caused by virus	85.9%	87.8%	1.9	87.2%	96.8%	9.6
HIV can be found in semen, vaginal secretions and blood	77.4%	83.9%	6.5	84.1%	97.7%	13.6
Cause of death of HIV infected is mainly due to recurrent infection	70.3%	68.7%	-1.6	70.1%	88.1%	18.0
Knowledge on Transmission						
Transmitted by sexual intercourse	92.2%	92.7%	0.5	96.6%	100.0%	3.4
Sharing blade or razors can transmit	72.1%	73.3%	2.6	75.1%	100.0%	24.9
Sharing syringe and needles can transmit HIV	79.2%	78.2%	1.2	85.7%	94.2%	8.5
Infected pregnant women can transmit HIV/AIDS	77.7%	80.9%	3.2	79.8%	93.9%	14.1
Breast milk can transmit HIV	68.9%	69.5%	0.6	69.5%	94.5%	25.0
Knowledge on non-transmission						
Shaking hands with HIV infected person	70.7%	73.3%	2.6	78.5%	100.0%	21.5
Coughing and spitting.	73.1%	75.2%	2.1	70.1%	92.9%	22.8
Mosquito bites.	56.2%	58.8%	2.6	62.0%	89.7%	27.7
Eating together with the HIV positive person	74.9%	77.1%	2.2	77.9%	96.8%	18.9
Hugging	79.5%	80.9%	1.4	80.4%	97.4%	17.0
Kissing	73.9%	74.8%	0.9	74.8%	92.3%	17.5

Table 3. Adolescents' knowledge on HIV/AIDS.

Outcome measures/Variables	Cont. Group		Increase in Knowledge (%)	Int. Group		Increase in Knowledge (%)
	Pre test	Post test		Pre test	Post test	
Knowledge on Risk-group						
Multiple sex partners (high risk)	87.3%	89.3%	2.0	85.0%	100.0%	15.0
Female sex workers (low risk)	75.6%	77.5%	1.9	70.1%	89.7%	19.6
Clients of sex workers (high risk)	71.0%	72.1%	1.1	65.7%	91.9%	26.2
People with STIs (high risk)	67.5%	69.5%	2.0	69.8%	89.0%	19.2
Migrant people (low risk)	59.4%	62.6%	3.2	46.4%	85.2%	38.8
Adolescent (low risk)	61.1%	66.8%	5.7	49.5%	80.6%	31.1
Knowledge on Sign/Symptoms						
Prolonged diarrhea	44.2%	55.3%	11.1	38.6%	89.4%	50.8
Prolonged Fever	60.1%	64.9%	4.8	63.9%	91.9%	28.0
Excessive weight loss	73.1%	76.3%	3.2	68.5%	93.9%	25.4
Knowledge on Prevention						
HIV/AIDS is a preventable disease.	51.6%	56.5%	4.9	44.2%	82.3%	38.1
Abstinence can prevent HIV/AIDS.	60.4%	63.0%	2.6	54.8%	86.8%	32.0
Condoms do not reduce the chance	69.3%	71.4%	2.1	56.7%	90.0%	33.3
Being faithful is the effective measure to prevent HIV/AIDS	72.8%	74.0%	1.2	68.5%	89.7%	21.2
Carefully tested blood transfusions do not reduce the chance of HIV/AIDS	54.4%	57.3%	2.9	41.4%	77.1%	35.7
Knowledge on Treatment						
ARV drug therapy cures HIV/AIDS.	42.4%	44.7%	2.3	39.9%	69.7%	29.8
ARV is needed only for few months.	48.4%	50.8%	2.4	34.9%	72.9%	38.0
ARV is only for prolonging life of the HIV patients.	44.9%	45.4%	0.5	39.3%	78.4%	39.1
Healthy life styles help to improve the quality of life of HIV/AIDS patients.	58.0%	55.7%	-2.3	57.6%	90.3%	32.7

Table 4. Pre-test knowledge scores of intervention and control groups.

Groups	Mean	SD	SE	t	p
Intervention Group (n = 321)	27.58	4.05	0.22	2.96	0.03
Control Group (n = 283)	28.53	3.77	0.22		

Table 5. Post-test knowledge scores of intervention and control groups.

Groups	Mean	SD	SE	t	p
Intervention Group (n = 310)	39.15	3.27	0.18	31.0	0.000
Control Group (n = 262)	29.55	3.92	0.24	31.4	

was 28.51 ± 3.79 , which is lower than the mean and SD 29.63 ± 3.97 of post-test. P-value shows that there is significant difference between the pre-test and post-test level of knowledge (**Table 6**). The mean and SD of the intervention group at pre-test was 27.59 ± 4.06 , which is lower than the mean and SD 38.77 ± 3.82 of post-test. It shows that there is significant difference between the pre-test and post-test level of knowledge in the intervention group (**Table 7**).

The findings of sexual risk behavior show that 6.7% of controls and 16.8% of intervention group students reported having sexual relations. Among sexually active students, 12 (54.5%) of controls and 47 (74.7%) were having sex for two or more times during the past 12 months. 77.2% and 58.8% of them had had sex with two or more people in the past 12 months in control and intervention group respectively. 72.8% of controls and 69.8% of intervention group had always used condom. Only 4.5% of controls and 15.8% of intervention groups had taken alcohol before having sex. Majority (68.1% controls; 79.3%-intervention) had sexual relationship with their girlfriend. Extremely few (0.4% in control; 3.7% in int.) had taken drugs in past 12 months. Likewise, 0.4% and 25.0% of them had shared needle and 1.1% and 3.4% had been tested for HIV in the control and intervention group respectively (**Table 8**).

4. Discussion

In baseline, 85.9% from control group and 87.2% from experimental group could answer that AIDS is caused by a virus, but greater percentage (94.8%) of students were aware of this information before the health education intervention in a study done by Sugathan and Swaysi [16].

In pre-test, 56.2% and 62% of students from control and intervention group could state that mosquito bite cannot transmit HIV/AIDS, which increased to 58.8% and 89.7% in both groups respectively. Similar types of finding was reported by Cheng et al., where insect bites' no risk of transmitting HIV was significantly higher in the intervention group (85.5%) than in the control group (27.6%) at post-test [10].

As for transmission of HIV/AIDS, nearly equal (68.9% and 69.5%) were aware of possibility of transmission to baby by lactating mother in both groups in pretest but, the percentage of correct response increased in intervention group

Table 6. Comparison of pre and post test HIV/AIDS knowledge scores of control group.

Phases of Testing (Control Group)	Mean	SD	t*	p	n
Total pre score	28.51	3.79	3.04	0.003	n1 (283)
Total post score	29.63	3.97			n2 (262)

*Paired t test.

Table 7. Comparison of pre and post test HIV/AIDS knowledge scores of intervention group.

Phases of Testing (Intervention Group)	Mean	SD	t	P	n
Total pre score	27.59	4.06	36.33	0.000	n1 (321)
Total post score	38.77	3.82			n2 (310)

Table 8. Sexual behavior of higher secondary students.

Variables	Cont. group	Int. group
	Pre test n (%)	Pre test n (%)
Have boyfriend/girlfriend		
Yes	89 (31.4)	141 (43.9)
No	194 (68.6)	180 (56.1)
Is he/she your sexual partner? (Pre test n = 283)		
Yes	19 (6.7)	54 (16.8)
No	264 (93.3)	267 (83.2)
Ever been forced to have sexual things?		
Yes	33 (11.7)	33 (10.3)
No	250 (88.3)	288 (89.7)
Ever been forced to have sex?		
Yes	21 (7.4)	38 (11.8)
No	262 (92.6)	283 (88.2)
Frequency of sexual behaviors in the past 12 months (n = 22)		
One only	10 (45.5)	16 (25.3)
Two or more	12 (54.5)	47 (74.7)
Number of people have you had sex in the past 12 months (n = 22)		
One only	17 (77.2)	37 (58.8)
Two or more	5 (22.8)	26 (41.2)
Frequency of using condoms		
Always	16 (72.8)	44 (69.8)
More than half time	3 (13.6)	7 (11.1)
Never used	3 (13.6)	12 (19.1)

Continued

Use of alcohol or drugs before sex?		
Yes	1 (4.5)	10 (15.8)
No	21 (95.5)	53 (84.2)
Person involved in the sexual activities in the past 12 months		
Girlfriend	15 (68.1)	50 (79.3)
Boyfriend	3 (13.7)	8 (12.7)
Others (sex workers, friend)	4 (18.2)	5 (8.0)
Used drugs in the past 12 months?		
Yes	1 (0.4)	12 (3.7)
No	282 (99.6)	309 (96.3)
Frequency of using drugs in the past 12 months		
One only	1 (0.4)	6 (50.0)
Two or more		6 (50.0)
Had ever shared the needle?		
Yes	1 (0.4)	3 (25.0)
Ever been tested for HIV?		
Yes	3 (1.1)	11 (3.4)
No	280 (98.9)	310 (96.6)

(95.5%) after education. Similar finding was reported by a study done in rural north Kerala of India [17]. In present study, more than 90% on both groups could answer that sexual intercourse with HIV infected can transmit the HIV/AIDS at baseline. In other areas of transmission and non-transmission, around 70% - 80% of respondents from both groups answered correctly in pre-test. The increment of correct response in post-test was ranging from 1.2% to 6.5% in control group, and 13.6% to 44.5% intervention group. Students of both groups had an intermediate level of knowledge regarding risk groups for HIV/AIDS. However, the intervention group students showed an increased rate of knowledge in post intervention evaluation. In this study, similar results were observed on signs and symptoms of HIV/AIDS also where students gained increased knowledge after health education.

There were 51.6% students in control and 44.2% students in experimental group who could correctly answered that HIV/AIDS is a preventable disease which increased to 56.5% in control group and 82.3% in intervention group after health education. Sugathan and Swaysi had noted that 92.4% of students were aware of its preventable nature and reached to 93.6% in post-test [15]. Similarly, the same study has revealed that 94.8% of students were having knowledge that there is no complete cure for AIDS before the intervention [15]. Contrary to this, present study showed that only 42.4% of control group and 39.9% intervention group students were aware of this fact prior to the educational intervention.

Overall pretest knowledge of both intervention and control groups was com-

parable with 27.58 ± 4.05 and 28.53 ± 3.77 mean \pm SD respectively. But statistical analysis showed significant higher knowledge ($P = 0.03$) among control group students than their counterparts in intervention group. After the educational intervention, the mean knowledge score of control group increased by only 0.47, whereas the same score increased by 11.57 and reached 39.15 ± 3.7 in post-test for intervention group. The difference in post-test score was statistically highly significant ($P < 0.001$). The difference in pre and post-test knowledge scores of both intervention and control groups were statistically significant with P-value of 0.000 and 0.003 respectively tested by paired t test. Similar finding was noted in a study done in Trinidad and Tobago among school students where both groups had statistically significant higher posttest scores on the variables of knowledge, susceptibility, and self-efficacy as it pertains to youth being able to speak about condoms and condom use [18]. Contrary to the present study, this study had covered wide dimensions of HIV/AIDS knowledge, practice, attitude and self-efficacy. A systemic review of 17 similar scientific papers regarding effectiveness of school based education on HIV knowledge and practice concluded that out of the 17 studies, 10 assessed the intervention's effects on knowledge. All 10 studies indicated that certain interventions could increase knowledge about one or more subjects which included STIs/HIV and their prevention [19].

Regarding the high risk sexual behavior, 6.7% of controls and 16.8% of intervention group reported having sexual relations. In support with this finding is a study where 11% reported that they had had sex before the age of sixteen [20]. Similar finding was reported in study done in Ethiopia [21]. In present study, nearly same (7.4% and 11.8%) students reported being forced for sex in control and intervention group respectively. Among sexually active students, 54.5% of controls and 74.7% were having sex for two or more times during the past 12 months. Among them, 77.2% and 58.8% of them had had sex with two or more people in the past 12 months in control and intervention group respectively. A study done in Nigeria among high school students revealed comparatively smaller proportion (20.5%) of the respondents who committed sex had sex with two and more sexual partners in their life time, 8.7% committed sex with more than one sexual partner [22]. Among the sexually active students, 72.8% of controls and 69.8% of intervention group had always used condom. Even 4.5% of controls and 15.8% of intervention groups had taken alcohol before having sex. Extremely few (0.4% in control; 3.7% in int.) had taken drugs in past 12 months.

5. Conclusion

The research finding showed that, there was significant difference between mean score of pre and post-test knowledge on HIV/AIDS, with higher knowledge in post-test of intervention group than their counterparts in control group. By this finding, the research hypothesis "there is significant difference on awareness level of adolescent students about HIV/AIDS before and after educational intervention among intervention and control group" has been accepted. It concludes that the educational intervention was efficacious in improving awareness of

adolescent students on HIV/AIDS. The study has also indicated that remarkable numbers of adolescents are practicing high risk behavior for HIV/AIDS like having early initiation sexual intercourse, multiple sex partners, using alcohol before intercourse etc. and very few sexually active students have tested their HIV/AIDS status.

6. Recommendation

Based on the finding of this study, it is expedient that HIV/AIDS education to students be provided during their higher secondary level study period. Decision-makers as well as school principal and teachers should realize that school education is an effective solution to prevent the spread of the HIV/AIDS epidemic. HIV/AIDS education should form part of school curriculum. Students should be periodically assessed for high risk sexual behavior. Counseling and referral service should be provided to the students with high risk behavior.

7. Limitations

Firstly, the population of the study only included Grade Twelve students from each selected HSS and did not include adolescents not attending such schools. Therefore, the results cannot be used to make a generalization about out-of-school adolescents. The honesty of some responses should also be interpreted with caution, especially those that pertain to questions about sex activities and drug abuse, because the data were self-reported by the students. Future research needs to focus on long-term and multi-stage interventions on the knowledge of HSS students about HIV/AIDS. Despite all of these limitations, this study might be a reasonable source of information for researchers and policymakers.

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Conflicts of Interest

None declared.

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Appendix A

Self administered questionnaire on efficacy of HIV/AIDS related educational package on awareness and high-risk behavior of adolescent students in Kathmandu metropolitan city.

Part I

Demographic Information

Instructions: Read each question carefully. Mark your answers in the square next to the questions. Mark one answer for each question, unless the instructions says to mark more than one answer.

1) How old are you today? (Please mention your completed years)

a.

2) Gender

a. Male

b. Female

3) Where is your permanent home address?

a. Inside Kathmandu valley

b. Outside Kathmandu valley

4) Ethnicity

a. Brahmans and Chhetris (parabatiya)

b. Brahmans and Chhetris (Tarai/Madhesi)

c. Dalits

d. Janajati

e. Newar

f. Others (please specify)

5) Religion

a. Hindu

b. Buddhist

c. Muslim

d. Christian

6) You live with,

a. Parents

b. Brother/Sister

c. Friends

d. Relatives

e. Hostel

f. Others (please specify)

7) Educational level of mother

a. No formal education (Cannot read and write)

b. She completed 8th grade or less than 8th grade

c. She completed higher secondary level

d. She completed bachelor level

e. Others (please specify)

8) Educational level of father

a. Cannot read and write

b. He completed 8th grade or less than 8th grade

c. He completed higher secondary level

d. He completed bachelor level

e. Others (please specify)

Part II

Information Related to Knowledge about HIV/AIDS

1) Where did you hear about HIV/AIDS? (Choose all that apply)

a. School

b. Mass Medias (TV/Radio/internet)

c. Peers (Friends) d. Health personnel e. Others

2) The full form of AIDS is:

- a. A-
- b. I-
- c. D-
- d. S-

3) The full form of HIV is:

- a. H- b. I- c. V-

4) AIDS is caused by:

- a. Virus b. Bacteria c. Fungi d. Protozoa

Please tick (✓) whether the following statements are true or false

S.N.	Statements	True	False
1.	HIV can be transmitted by sexual intercourse.		
2.	HIV can be found in semen, vaginal secretions and blood.		
3.	Sharing blade or razors can transmit HIV.		
4.	Sharing syringe and needles can transmit HIV.		
5.	HIV is transmitted through shaking hands with HIV infected person.		
6.	HIV can be transmitted by mosquito bites.		
7.	HIV can be transmitted by coughing and spitting.		
8.	HIV can be transmitted by eating together with the HIV positive person in same utensil.		
9.	HIV can be transmitted by hugging with the HIV positive person.		
10.	HIV can be transmitted by kissing with the HIV positive person.		
11.	There is a chance to transmit HIV/AIDS while giving child birth by HIV infected mother.		
12.	There is a chance to transmit HIV/AIDS through breast feeding from HIV positive mother to her new born baby.		
13.	People having multiple sex partners are at high risk for HIV/AIDS.		
14.	Female sex workers are at low risk for HIV/AIDS transmission.		
15.	Clients (customers) of sex workers are at high risk for HIV/AIDS.		
16.	People who have other sexually transmitted infections are at high risk for HIV/AIDS.		
17.	Seasonal labor migrants (migrant workers) are at low risk for HIV/AIDS.		
18.	Adolescents are at low risk for HIV infection.		
19.	One of the main signs of AIDS is prolonged diarrhoea for more than one month.		
20.	Prolonged fever is also the main sign of HIV/AIDS.		
21.	Excessive weight loss (more than 10% of body weight) is also the main sign of HIV/AIDS.		
22.	Cause of death of HIV infected person is mainly due to recurrent infection (any kind).		

Continued

-
23. HIV/AIDS is a preventable disease.
 24. Abstinence (self-controlling) from sex can prevent HIV/AIDS.
 25. Use of condoms does not reduce the chance of acquiring HIV/AIDS.
 26. Being faithful with own sex partners is the effective measure to prevent HIV/AIDS.
 27. Carefully tested blood transfusions do not reduce the chance of acquiring HIV/AIDS.
 28. Antiretroviral (ARV) drug therapy can cure HIV/AIDS.
 29. Antiretroviral therapy is needed only for few months.
 30. Antiretroviral therapy is only for prolonging life of the HIV patients.
-

Part III**High Risk Behaviors related to HIV/AIDS**

- 1) Are you married?
 - a. Yes
 - b. No
- 2) Do you have boyfriend/girlfriend?
 - a. Yes
 - b. No
- 3) Is he/she your sexual partner?
 - a. Yes
 - b. No.
- 4) Has someone ever forced you to have sexual things you didn't want to?
 - a. Yes
 - b. No
- 5) Has someone ever forced you to have sex?
 - a. Yes
 - b. No
- 6) How many times have you had sex in the past 12 months?
 - a. I have not had sex in the past 12 months
 - b. 1 time
 - c. 2 times
 - d. 3 times
 - e. 4 times
 - f. 5 times or more
- 7) How many people have you had sex with the past 12 months?
 - a. I have never had sex
 - b. 1 person
 - c. 2 person
 - d. 3 person
 - e. 4 person
 - f. 5 person or more
- 8) Of all the times you have had sex, how often did you use condoms?
 - a. I have never had sex
 - b. We always used condoms
 - c. We used condoms more than half the time
 - d. We used condoms half the time
 - e. We used condoms less than half the time
 - f. We never used condoms
- 9) The last time you had sex, did you drink alcohol or use drugs before you had sex?

- a. I have never had sex
- b. Yes
- c. No

10) In the past 12 months, who was the person you were involved in the sexual activities? (You can tick more than one option)

- a. I have never had sex in the past 12 months.
- b. Girlfriend
- c. Boyfriend
- d. Female sex workers
- e. Friend
- f. Relative
- g. Family member

11) In the past 12 months, have you used drugs (illegal)?

- a. Yes
- b. No

12) If yes, what type of drugs had you used?

- a. Tablets
- b. Syrup (liquid drugs)
- c. Injection
- d. Sniffing drugs
- Yes/No
- Yes/No
- Yes/No
- Yes/No

13) How many times have you had drugs (illegal) in the past 12 months?

- a. I have not had drugs in the past 12 months
- b. 1 time
- c. 2 times
- d. 3 times
- e. 4 times
- f. 5 times or more

14) If you had used injectable drugs, had you shared the needle with other friend?

- a. Yes
- b. No

15) Have you ever been tested for HIV?

- a. Yes
- b. No