ORIGINAL ARTICLE

Promoting sexual abstinence intention among female university students: A quasi-experimental study

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Background: The effectiveness of a theory-based educational intervention on intension for sexual abstinence among female university students was evaluated. **Materials and Methods:** Female students were recruited from humanity sciences department through cluster sampling. Educational intervention was applied for four 90-min sessions and by application of cognitive theories during 4 weeks. **Results:** One hundred and nine female students with mean age of 20.74 ± 1.57 years took part in the study. Despite the similarity of two groups of intervention (n = 53) and control (n = 59) at baseline, there were significant differences between the two groups in mean scores of the variables, knowledge (4.62 ± 1.38 vs. 3.53 ± 1.61), perceived susceptibility (14.05 ± 1.51 vs. 12.37 ± 2.11), and perceived benefits (28.41 ± 2.14 vs. 27.51 ± 3.05), at follow-up time after 3 months ($P < 0.05$). Additionally, these variables were observed with improvement over 3 months in the intervention group ($P < 0.05$). However, this study showed no significant effect on the behavior intention and self-efficacy. **Conclusion:** This study showed that educational intervention could improve knowledge, perceived benefits, and self-efficacy of the female students regarding HIV/AIDS.

Key words: Attitude, health education, human immunodeficiency virus , knowledge, sexual abstinence

INTRODUCTION

Throughout the history of human beings, HIV/AIDS has been one of the greatest challenges that have made the world unable to find an effective cure.[1] Since its discovery, over 25 million lives have been lost in just 30 years.[2] Thus, the mortality and morbidity rate of this disease remains high, especially in developing world.[3] The first case of HIV infection in Iran was reported in 1986 which was a child diagnosed with hemophilia. However, the spread of the HIV epidemic in Iran has been ever increasing since that time.[4] According to the center of disease management of Iran, the incidence of newly reported case of HIV was found to be highly increasing.[5]

According to the world reports, about 50% of the recent HIV infections are amongst the youth of age range 15-24 years.[6] Iran, a country with mostly young population, is at risk of increased HIV rate. Reports from the Center of Disease Control of the Ministry of Health and Medical Education of Iran showed that the rates of risky behaviors, which could lead to HIV/AIDS infections, are increasing rapidly. The study conducted in 2006 indicated that 28% of teenage boys living in Tehran verified their unsafe sexual behaviors.[7]

Attempts to control the disease have concentrated on the preventive behaviors, so education and preventive strategies to change unhealthy behaviors have been considered as the first priorities.[8-10]

Preventive strategies toward HIV/AIDS are directed by some healthy behavior changes based on theories and models.[11] Most of the previous educational interventions were based on theories such as social cognitive theory (SCT), theory of reasoned action (TRA), and health belief model (HBM).[12] Most theories of healthy behavior regard cognitive determinants of the HIV risk such as knowledge, attitude, and behavioral intention to address preventive strategies.[13] Previous studies revealed that educational interventions could improve knowledge, self-efficacy, attitude, behavioral intention, and also behavior of condom using.[14-17] However, Walker's study showed education could not improve condom using behavior.[18]

Educational and inspirational interventions suitable to the youth's cultural values had been the focus of the previous study.[19] For instance, in the study conducted in Iran, defining sexual health program based on specific needs of Iranian women due to their information and concerns was verified.[20] On the other hand, since in

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Iran due to some cultural restrictions (considerations), the majority of health improvement intervening studies regarding HIV/AIDS have been focused on male students rather than female, in this study, the female students were selected as the target group. On the other hand, evidences show that female gender is more physiologically vulnerable to be infected with HIV/AIDS. Thus, women are at higher risk to the consequences of HIV/AIDS, compared to men.[21] Furthermore, it has been documented while the educational interventions are in consistence with the culture and being designed to meet needs of a target population, it would be more likely to get positive results.[22]

As previous evidences reported, more than half of new AIDS/HIV infection cases are in the age range of 15-24 years,[6] and this age group is mostly found in universities. However, due to its centrality and being regarded as the mother university, the University of Tehran was chosen as the place of the study. Moreover, as all the students of the University of Tehran were studying in three majors of humanities, engineering, and fundamental sciences, and also 60% of them were studying in humanity science at the time of the study, the subjects of this study were selected from this faculty.

This study was designed to investigate the effects of the educational intervention based on social cognitive theory on knowledge, self-efficacy, perceived benefits, perceived susceptibility, sexual abstinence intention, and refusal intention of female students of Tehran university.

MATERIALS AND METHODS

Study setting

This study was a quasi-experimental research that was conducted among female students of Tehran University in Tehran, Iran, from 2009 to 2010. To be eligible for the study, the students had to be aged between 15 and 25 years, single, living in Tehran, and also be willing to take part in the study. Students who reported to be suffering from any disabilities or infectious disease were excluded from the study. The study was approved by the ethics committee of Tehran University and ethical principles were adhered to throughout the study with research project number 181. Participants provided informed consent, confirmed in writing, after they were explained the purpose and procedures of the study.

Using cluster sampling, among all faculties of humanity sciences, two faculties of law and literature were randomly selected; then from these two faculties, two classes, one class from law faculty and the other class from literature faculty, were selected randomly. Finally, all female students of the classes who met the inclusion criteria and were willing to enter the study were chosen. In this study, the participants from law faculty were considered as experimental group and the other students were labeled as control group. The interviewer who collected data and the statistical analyst were masked to the group assignment, while the participants were instructed to say nothing about their group assignment to the interviewer. Because of the nature of the intervention, full masking of participants was impractical.

A total of 109 participants were enrolled in the study as intervention group (n = 53) who received educational intervention plus routine education or control group (n = 56) who received just routine education.

Data collection

A basic demographic questionnaire as well as a questionnaire generated based on the previous studies[23-25] were administered to both groups at two points of time as baseline and follow-up.

To check the validity of the questionnaire, a group of 20 experts who were specialists in the fields of nursing, health education, infection science, and behavioral psychology rated the questionnaire. Their answers were "essential," "useful," or "not necessary" for each item. The number of "essential" ratings for the items was calculated. The formula CVR = [(E − (N/2))/(N/2)], using the total number of experts (N) and the number who rated the items as essential (E), was applied to determine the content validity ratio (CVR). Of all primary questions of the questionnaire, three self-efficacy questions, three perceived susceptibility questions, nine perceived benefit questions, and three behavioral intention questions were eliminated due to their low CVR of <0.42. CVR for the 50-item questionnaire was calculated as 0.84. The final version of knowledge scale was provided with three questions rated through 3-option Likert system of yes, no, and not sure. Each option of yes or no was scored as 2 and not sure scored as 1. Thus, the whole knowledge scale was scored in the range of 0-6, in which 0 was the worst and 6 was the best score. Other scales used 5-option Likert system which were scored from 1 for strongly disagree to 5 for strongly agree. In this scoring, behavioral intention questionnaire with four questions was scored from 4 to 20, self-efficacy with three questions was scored from 3 to 15, perceived benefits with six questions was scored from 6 to 30, and perceived susceptibility was scored from 5 to 25.

The assigned time for completing the final 50-item questionnaire was 6-7 min that was confirmed by the researcher and the experts who reviewed the questionnaire.

To determine reliability, a test–retest with a time interval of 2 weeks was administered to knowledge, self-efficacy, and behavioral intention questions, and the results were

satisfactory (r = 0.73, r = 0.79, and r = 0.87, respectively). Cronbach's alpha or internal consistency was 0.87 for perceived benefits, 0.77 for behavioral intention, 0.85 for self-efficacy, and 0.70 for perceived susceptibility, which confirmed the scale. The questionnaires were consciously and willingly administered to the anonymous participants.

Intervention

Firstly, the students in both groups completed the self-administrated questionnaires. Then an educational program based on a course plan for teaching about HIV/AIDS[26] in accordance with gender issues of the female students was educated by the first author. As it is documented, intervention for HIV/AIDS prevention targeted on females should be gender based and appropriate with respect to the subjects' sex.[27]

The aim of the educational intervention was to increase the intended behavior of sexual abstinence and refusing risky offers through increasing subjects' knowledge, perceived benefits, and susceptibility. Educational intervention was applied through four 90-min sessions during 4 weeks, based on the selected mentioned variables and by applying the designed educational intervention. The educational methods included lectures with power points, question and response sessions, group discussion, and team work. In order to have the ultimate effects on subjects, the intervention was student based and involved the students' participation actively. The teaching materials were on the basis of female students' needs.

In the first session, the learning strategies regarding knowledge awareness promotion about HIV/AIDS and risky behavior were applied. By asking the key question "Have you ever thought about HIV/AIDS?" at the beginning of the first session, the students were asked to think about AIDS. Then, they were taught about HIV/AIDS epidemiology, its global statistics, and ways of identifying the disease, using audiovisual equipments. Afterward, the students were given a paper and asked to write the ways of HIV/AIDS transmission and prevention in two separate columns.

In the second session, educational strategies about improving attitude toward abstinence and refusing risky offers were discussed. The students in groups of four to five persons discussed the task. At the end of the group discussion, representatives of each group presented the achieved results to the rest of the students, and then the researcher explained the vague points and answered the students' questions. Also, the ways of transmission and disease cycle were presented and their misconceptions were corrected. For instance, there were some misconceptions like "anal sex does not lead to HIV/AIDS," "by having sex once, a person will not be infected," or "only pervert people become infected"; therefore, some explanations were given.

Furthermore, in the second session, through the prevention ways, the students were asked to talk about their feelings toward sexual abstinence. For providing the students with clear and more precise prevention techniques, extracts from the Holy Quran verses and religious literature were used, which brought about a kind of religious support. Also, the address of the behavior consulting center and its services was presented. During the third session, discussion about perceived susceptibility and perceived risk was offered and it was also discussed that women and girls are more vulnerable to the infection. They were asked to think about the reasons of this potentiality and write their opinions on a paper.

Early prevention interventions that have positive effects on behavior, intention, attitude, and beliefs include self-efficacy increasing programs.[28] Therefore, in the fourth session, the focus was on the construct of self-efficacy and teaching materials concentrating on self-efficacy, refusal skills, assertiveness, avoiding risky situations, and abstinence; also, there was an elaborate speech on the techniques of how to say "no." As Bandura discussed, perceiving self-efficacy increases through four ways: Success in action, persuasive discourse, replacement experience, and physiologic or emotional states.[29] In the educational sessions, discourse intriguing and making the students sure about possessing expose skills and decisiveness were employed frequently. Religious and cultural, worthiness of being virtuous were discussed repeatedly. Also, the skill of self-efficacy was emphasized by narrating a scenario. The scenario was about a girl student who suggests her friend to go to a party, but she refuses with decisive answers. Afterward, the participants were asked to write a short story about a girl who was experiencing a high-risk situation, and to analyze how she could avoid such situation. This task provides them with replacement experience. At the end, a multimedia educational package (CD) and a book with the name "Healthy Life" were distributed among the participants. In addition, the educational movie "Born with HIV/AIDS" was shown for them, which focused on several guiding points for girls.

Three months after applying the educational program, the same questionnaires except for demographic questions were administered to the intervention and control groups. The final analysis through comparing the two groups was done to determine how effective the educational intervention was on the desired variables. The control group did not undergo any intervention in their regular curricula. However, due to ethical considerations, the materials were presented to the control group at the end of the study.

Statistical analyses

The results were analyzed by SPSS 14, *t*-test, paired *t*-test, Mann–Whitney U test, and Wilcoxon signed-rank test, with a significance level of 5%.

RESULTS

The mean age of the subjects was 20.74 ± 1.57 years; among them 35.7% (n = 41) were Tehran dwellers. First, the variables' distribution was investigated by Kolmogorov–Smirnov test, where it was found that variables of age and perceived susceptibility construct had a normal distribution while the other variables did not.

As the findings demonstrated, the students' fathers' educational background in 41.5% (n = 21) of the experimental group and 42.9% (n = 24) of the control group were above high school diploma, while the value were 18.9% (n = 10) and 23.6% (n = 13) for mothers of participants in the experimental and control groups, respectively. The Mann–Whitney test did not show any significant difference here. The majority of the participants reported their family income to be in a stable level and there was no significant difference between the groups regarding this variable. In regards to familial dimension, Mann–Whitney did not demonstrate any significant difference either. Therefore, both groups were similar in these background variables. Furthermore, with respect to pre-test variables level, the two groups did not have any significant difference and a considerable number of participants admitted that their information about HIV/AIDS was at an average level [Table 1].

In order to make a comparison between the intervention and control groups, they need to be compared with regard to their similarities. No significant statistical differences existed between the two groups with regards to mean scores of independent study variables before the intervention ($P > 0.05$). In fact, both the groups were consistent with regard to all variables.

Table 2 shows a significant difference in the intervention group between two time points of before and after intervention with regard to the variables of knowledge, perceived susceptibility, and perceived benefit ($P < 0.05$).

According to Table 2, the results of the data in two stages of before and after intervention showed no significant difference in the control group.

DISCUSSION

The prevalence rate of HIV/AIDS is increasing,[30] and this increase has attracted the researches' attention to examine the knowledge and attitude of individuals and community groups.[31]

The findings of this research indicated that knowledge score in the pre-test for both groups was at an intermediate level, which reached to a desirable level after the intervention.

In both groups, the pre-test scores of perceived benefits were above half of the questionnaire's obtainable scores, which were at a favorite level. The scores of perceived susceptibility in both groups were at a moderate level. Behavioral intention and perceived benefits' scores were higher than the others. The results of this study showed improvement of intervention group regarding knowledge, perceived susceptibility, and perceived benefit after educational intervention, which is an indicator of the positive effects of the gender-based and culturally based educational intervention. As these differences were not found in the control group, it is highly likely that educational intervention was the reason for these effects.

Also, the results indicated that HIV/AIDS education can result in an increase of HIV knowledge of the female students in the intervention group, whereas in the control group, no such increases were found. Previous school-based interventions showed these increases in the knowledge of study populations as well.[12,32] However, knowledge cannot predict a healthy sexual behavior on its own. For instance, in a study by Davis *et al*. (2007) on African-American students, it was found that more knowledge, lower age, sexual contacts with more than one partner, positive attitude toward condom use, more personal behavioral skills, and male sexuality were the main predictors of condom using behavior.[33]

Results of the present study showed that perceived benefits before the educational intervention in both groups were at favorite levels, and designed education was successful in having a positive and significant effect on the perceived benefits of sexual abstinence and avoidance of risky situation. In some other theory-based studies, the same results were obtained.[34-36] One study carried out in Iran by Eshrati *et al*. (2008)[37] also confirmed this finding. In a study conducted on prisoners which was aimed to investigate the effects of the risk reduction education according to the HBM, it was revealed that the only model construct correlating with decrease of high-risk behavior was the perceived benefit. As a result, when the prisoners were convinced of the effectiveness of risk reduction strategies, they decreased their high-risk behaviors.

Another objective of the present study was to determine and compare the self-efficacy of sexual abstinence and avoidance of high-risk situations in female students before and after the intervention in the intervention and control groups. In the pre-test of both groups, self-efficacy scores were above half of the questionnaire's obtainable score, which was

Table 1: Comparison of mean scores of constructs in intervention and control groups pre-test and post-test separately using *t*-test and Mann–Whitney U test

Variables	Pre-test groups			Post-test groups		
	Intervention mean (SD)	Control mean (SD)	*P* value	Intervention mean (SD)	Control mean (SD)	*P* value
Self-efficacy	13.46 (1.7)	13.47 (2.14)	0.36	13.69 (1.79)	13.33 (2.07)	0.56
Behavioral intention	19.08 (1.47)	18.67 (2.06)	0.32	19.09 (1.69)	18.85 (1.93)	0.63
Perceived benefits	27.2 (3.37)	27.29 (3.91)	0.74	28.41 (2.14)	27.51 (3.05)	0.03
Knowledge	3.69 (1.35)	3.59 (1.49)	0.65	4.62 (1.38)	3.53 (1.61)	0.0001*
Perceived susceptibility	12.9 (1.57)	12.29 (2.49)	0.26	14.05 (1.51)	12.37 (2.11)	0.0001*

*Significant at the 0.05 level

Table 2: Comparison of mean scores of constructs in intervention and control groups pre-test and post-test using Wilcoxon signed-rank test

Variables	Intervention					Control				
	Pre-test		Post-test			Pre-test		Post-test		
	Mean	SD	Mean	SD	*P* value	Mean	SD	Mean	SD	*P* value
Self-efficacy	13.46	1.7	13.69	1.79	0.31	13.47	2.14	13.33	2.07	0.7
Behavioral intention	19.08	1.47	19.09	1.69	0.17	18.67	2.06	18.85	1.93	0.07
Perceived benefits	27.2	3.37	28.41	2.14	0.005*	27.29	3.91	27.51	3.05	0.30
Knowledge	3.69	1.32	4.62	1.38	0.0001*	3.59	1.49	3.53	1.61	0.82
Perceived susceptibility	12.9	1.57	14.05	1.51	0.0001*	12.29	2.49	12.37	2.11	0.73

This variable had a normal distribution, thus paired *t*-test was employed; *Significant at the 0.05 level

at a favorable level. After the education, both groups did not show a significant difference in the self-efficacy scale, which contradicts some other study results. For example, an educational intervention based on SCT was carried out in HIV-positive patients in the State of Georgia of USA to reduce their high-risk behaviors. In that study, education had a significant effect on reduction of unprotected sex, condom use behavior, and self-efficacy of suggesting using condom to a new sexual partner.[38] Furthermore, in a study on pregnant African-American adolescents, negotiating and refusal skills had significant effects on self-efficacy in avoiding high-risk sexual behaviors; the author regards this effect as a result of the cultural context of this group.[39] Also, in a randomized control trial (RCT) carried out on couples in California, which was done in three sessions according to Fishbein's integrated behavior change model and Information, Motivation, Behavior Skills

(IMB) model, education had positive effects on self-efficiency of condom use.[40] Perhaps this difference is due to the fact that education can have different effects in different cultural contexts. Students claimed that being constantly told to say "No" and creating a sense of fear of the opposite sex might have been the reasons why the researcher's education was unable to increase self-efficacy. Besides, it can be argued that educational interventions to increase self-efficacy which are combined with behavioral skills should most likely be carried out over a long period of time and continuously.

With regard to the behavioral intention, in the pre-test of both groups, its scores were above half of the questionnaire's obtainable score, which was at a high favorite level; thus, education had no significant effects on its increase in the control group. When people are asked about behaviors which are not along with common ethics of society, the answers get close to what is approved by the society; this is true among girls since our community has passed more strict rules and customs for them compared to the other gender. Also, this behavioral intention was high at the time of pre-intervention and concordantly one must not expect a significant increase. There are similar results about intention in other overseas studies. For instance, in a school-based study in Ukraine, no increase was observed in intention to refuse sexual behaviors among students after a six-session intervention.[41] Also, in the study conducted by Morrison-Beedy (2005), HIV/AIDS risk reduction group-based education based on the IMB model had no significant effect on the behavioral intention of HIV/AIDS risk reduction (i.e., using condoms, not taking drugs and alcohol before sexual activity) among teenage girls. Nevertheless, like the present study, it had a significant effect on knowledge, motivation, and reducing negative aspect of using condoms, which emphasizes the importance of prerequisites to behavior change. Crepaz, *et al*. concluded in their meta-analysis that successful interventions would be theory-based ones and those which were based on ethnographic research and focused on building skills. They also revealed the intervention should be in accordance with the cultural context.[1]

There are some limitations in this study, such as small sample size and specific participants among Islamic

culture should be considered in interpreting of the results. In the present study, the impact of the intervention was investigated after 3 months, though more precise long-term investigations for 6-12 months are required to indicate the effect of such educational intervention.

CONCLUSION

This study has shown that educational intervention could improve knowledge, perceived benefits, and self-efficacy of the female students regarding HIV/AIDS.

REFERENCES

1. Akinsola HA. Fostering hope in people living with AIDS in Africa: The role of primary health-care workers. Aust J Rural Health 2001;9:158-65.
2. Karceski S. HIV/AIDS and neurologic diseases. Neurology 2010;75:e56-8.
3. Ivers LC, Cullen KA, Freedberg KA, Block S, Coates J, Webb P. HIV/AIDS, undernutrition, and food insecurity. Clin Infect Dis 2009;49:1096-102.
4. Ghabili K, Shoja MM, Kamran P. The Iranian female high school students' attitude towards people with HIV/AIDS: A cross-sectional study. AIDS Res Ther 2008;5:15.
5. Fallahzadeh H, Morowatisharifabad M, Ehrampoosh MH. HIV/AIDS epidemic features and trends in Iran, 1986-2006. AIDS Behav 2009;13:297-302.
6. Clark TS, Friedrich GK, Ndlovu M, Neilands TB, McFarland W. An adolescent-targeted HIV prevention project using African professional soccer players as role models and educators in Bulawayo, Zimbabwe. AIDS Behav 2006;10:S77-83.
7. Mohammadi MR, Mohammad K, Farahani FK, Alikhani S, Zare M, Tehrani FR, *et al*. Reproductive knowledge, attitudes and behavior among adolescent males in Tehran, Iran. Int Fam Plan Perspect 2006;32:35-44.
8. Hasnain M. Cultural approach to HIV/AIDS harm reduction in Muslim countries. Harm Reduct J 2005;2:23.
9. Zolfo M, Lynen L, Dierckx J, Colebunders R. Remote consultations and HIV/AIDS continuing education in low-resource settings. Int J Med Inform 2006;75:633-7.
10. Ungan M, Yaman H. AIDS knowledge and educational needs of technical university students in Turkey. Patient Educ Couns 2003;51:163-7.
11. Kalichman SC, Picciano JF, Roffman RA. Motivation to reduce HIV risk behaviors in the context of the Information, Motivation and Behavioral Skills (IMB) model of HIV prevention. J Health Psychol 2008;13:680-9.
12. Donenberg GR, Schwartz RM, Emerson E, Wilson HW, Bryant FB, Coleman G. Applying a cognitive-behavioral model of HIV risk to youths in psychiatric care. AIDS Educ Prev 2005;17:200-16.
13. Mahat G, Scoloveno M. An HIV/AIDS education intervention for Nepalese adolescent females. Nurs Clin North Am 2006;41:409-23.
14. Kinsler J, Sneed CD, Morisky DE, Ang A. Evaluation of a school-based intervention for HIV/AIDS prevention among Belizean adolescents. Health Educ Res 2004;19:730-8.
15. Cheng Y, Lou CH, Mueller LM, Zhao SL, Yang JH, Tu XW, *et al*. Effectiveness of a school-based AIDS education program among rural students in HIV high epidemic area of China. J Adolesc Health 2008;42:184-91.
16. Di Noia J, Schinke SP. Gender-specific HIV prevention with urban early-adolescent girls: Outcomes of the Keepin' It Safe Program. AIDS Educ Prev 2007;19:479-88.
17. Walker D, Gutierrez JP, Torres P, Bertozzi SM. HIV prevention in Mexican schools: Prospective randomised evaluation of intervention. BMJ 2006;332:1189-94.
18. Basen-Engquist K, Coyle KK, Parcel GS, Kirby D, Banspach SW, Carvajal SC, *et al*. Schoolwide effects of a multicomponent HIV, STD, and pregnancy prevention program for high school students. Health Educ Behav 2001;28:166-85.
19. Sales JM, Spitalnick J, Milhausen RR, Wingood GM, DiClemente RJ, Salazar LF, *et al*.Validation of the worry about sexual outcomes scale for use in STI/HIV prevention interventions for adolescent females. Health Educ Res 2009;24:140-52.
20. Mize SJ, Robinson BE, Bockting WO, Scheltema KE. Meta-analysis of the effectiveness of HIV prevention interventions for women. AIDS Care 2002;14:163-80.
21. Mohtasham G, Shamsaddin N, Bazargan M, Anosheravan K, Elaheh M, Fazlolah G. Correlates of the intention to remain sexually inactive among male adolescents in an Islamic country: Case of the Republic of Iran. J Sch Health 2009;79:123-9.
22. Miller BC, Norton MC, Fan X. Christopherson CR. Pubertal Development, Parental Communication, and Sexual Values in Relation to Adolescent Sexual Behaviors. J Early Adolesc 1998;18:27-52.
23. Lux KM, Petosa R. Preventing HIV Infection Among Juvenile Delinquents. Educational Diagnosis Using the Health Belief Model. Int Q Community Health Educ 1994;15:145-64.
24. Anavberokhai MO. Model HIV/AIDS Education Curriculum for Practitioners. J Hum Ecol 2006;20:289-94.
25. Morrison-Beedy D, Carey MP, Aronowitz T, Mkandawire L, Dyne J. Adolescents' input on the development of an HIV risk reduction intervention. J Assoc Nurses AIDS Care 2002;13:21-7.
26. DeMarco RF, Kendricks M, Dolmo Y, Looby SE, Rinne K. The effect of prevention messages and self-efficacy skill building with inner-city women at risk for HIV infection. J Assoc Nurses AIDS Care 2009;20:283-92.
27. Murray-Johnson L, Witte K, Boulay M, Figueroa ME, Storey D, Tweedie I. Using health education theories to explain behavior change: A cross-country analysis. 2000-2001. Int Q Community Health Educ 2005;25:185-207.
28. Ryalat ST, Sawair FA, Shayyab MH, Amin WM. The knowledge and attitude about HIV/AIDS among Jordanian dental students: (Clinical versus pre clinical students) at the University of Jordan. BMC Res Notes 2011;4:191.
29. Ogunsemi OO, Lawal RA, Okulate GT, Alebiosu CO, Olatawura MO. A comparative study of HIV/AIDS: The knowledge, attitudes, and risk behaviors of schizophrenic and diabetic patients in regard to HIV/AIDS in Nigeria. Med Gen Med 2006;8:42.
30. Harvey B, Stuart J, Swan T. Evaluation of a drama-in-education programme to increase AIDS awareness in South African high schools: A randomized community intervention trial. Int J STD AIDS 2000;11:105-11.
31. Davis C, Sloan M, MacMaster S, Kilbourne B. HIV/AIDS knowledge and sexual activity: An examination of racial differences in a college sample. Health Soc Work 2007;32:211-8.
32. Strange V, Forrest S, Oakley A; RIPPLE Study Team. Randomized Intervention of PuPil-Led sex Education. Peer-led sex education-characteristics of peer educators and their perceptions of the impact on them of participation in a peer education programme. Health Educ Res 2002;17:327-37.
33. Butts JB, Hartman S. Project BART: Effectiveness of a behavioral intervention to reduce HIV risk in adolescents. MCN Am J Matern Child Nurs 2002;27:163-9.
34. Ross DA, Changalucha J, Obasi AI, Todd J, Plummer ML,

Cleophas-Mazige B, *et al*. Biological and behavioural impact of an adolescent sexual health intervention in Tanzania: A community-randomized trial. AIDS 2007;21:1943-55.
35. Eshrati B, Asl RT, Dell CA, Afshar P, Millson PM, Kamali M, *et al*. Preventing HIV transmission among Iranian prisoners: Initial support for providing education on the benefits of harm reduction practices. Harm Reduct J 2008;5:21.
36. Kalichman SC, Rompa D, Cage M, DiFonzo K, Simpson D, Austin J, *et al*. Effectiveness of an intervention to reduce HIV transmission risks in HIV-positive people. Am J Prev Med 2001;21:84-92.
37. DiClemente RJ, Wingood GM, Rose E, Sales JM, Crosby RA. Evaluation of an HIV/STD sexual risk-reduction intervention for pregnant African American adolescents attending a prenatal clinic in an urban public hospital: Preliminary evidence of efficacy. J Pediatr Adolesc Gynecol 2010;23:32-8.
38. Harvey SM, Kraft JM, West SG, Taylor AB, Pappas-Deluca KA, Beckman LJ. Effects of a health behavior change model-based HIV/STI prevention intervention on condom use among heterosexual couples: A randomized trial. Health Educ Behav 2009;36:878-94.
39. Kyrychenko P, Kohler C, Sathiakumar N. Evaluation of a school-based HIV/AIDS educational intervention in Ukraine. J Adolesc Health 2006;39:900-7.
40. Morrison-Beedy D, Carey MP, Kowalski J, Tu X.Group-based HIV risk reduction intervention for adolescent girls: Evidence of feasibility and efficacy. Res Nurs Health 2005;28:3-15.
41. Crepaz N, Horn AK, Rama SM, Griffin T, Deluca JB, Mullins MM, *et al*. The efficacy of behavioral interventions in reducing HIV risk sex behaviors and incident sexually transmitted disease in black and Hispanic sexually transmitted disease clinic patients in the United States: A meta-analytic review. Sex Transm Dis 2007;34:319-32.

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