A school-based educational intervention with risk-reduction and harm-reduction methods for HIV prevention

Abstract

Purpose
To assess the scope of knowledge related to HIV among white, rural, adolescents in Ida, Michigan and evaluate the effectiveness of a school-based educational intervention program.
Methods
The study was a quasi-experimental study conducted in a rural high school in Michigan. A total of 12 students from Ida High School participated in the intervention. The same HIV questionnaire was given to students before and after an educational intervention program. Ten returned the pre-intervention questionnaire and 11 returned the post-intervention questionnaire.
Results
Overall the program was very effective in providing the study population with knowledge relating to the definition of HIV, the difference between HIV and AIDS, and methods of protection from HIV infection. The intervention was mostly effective in providing students with the knowledge of all ways to transmit HIV and it was not effective in explaining the definition of AIDS.
Conclusions
After receiving the intervention, students from Ida high school are more able to protect themselves from HIV infection because they hold the knowledge necessary to do so.

Assessment

Healthy People 2010 defines several health risks for adolescents. Diabetes, depression, inactivity, sexually transmitted infections (Health & Human Services, 2000), and HIV are just a few of these health risks affecting adolescents. Providing the education for adolescents to protect themselves from STIs and HIV can be easy and effective and has the chance to make a major difference in the health of this population. One of the goals for Healthy People 2010 is to prevent HIV infection and its related illness and death. Increasing the proportion of sexually active persons who use condoms from 23 % to 50% is one objective for decreasing HIV infection (Health & Human Services, 2000). Education on consistent condom use as a method to prevent HIV infection as well as other methods of risk reduction and harm reduction will contribute to the 2010 goal of preventing HIV infection.

In 2004 the Centers for Disease Control and Prevention (CDC) reported an estimated 4,883 young people as receiving a diagnosis of HIV infection or AIDS, representing 13% of people diagnosed that year. Young people are particularly at risk for HIV infection because of a lack of knowledge of HIV transmission or prevention. In conservative communities such as Monroe County, HIV education may focus on abstinence and adolescents may not be taught about harm-reduction methods for HIV prevention. Reports from the National Youth Risk Behavior Survey by the CDC (2006) show 46.8% of students grades 9-12 had sexual intercourse during their lifetime. 14.3% of students had sexual intercourse with four or more persons during their life. Of students engaging in sex, only half report using condoms consistently. Among rural high school students, a study of STD-/HIV-related sexual risk behaviors and substance use revealed 37.9% of the survey population was sexually active. Of these sexually active rural teens, 57.4% reported using a condom the last time they had sex (Yan, Chiu, Stoesen, & Wang, 2007). White rural adolescents in this study were most likely to report not using a condom the last time they had sex. Female students were also more likely to report not using a condom (Yan, Chiu, Stoesen, & Wang, 2007).

The Health and Consumer Protection Directorate of the European Union (2007) published a press release saying 24% of EU citizens are wrongly convinced you can be infected with HIV/AIDS by kissing on the mouth and 30% are unsure on this, meaning half of all EU citizens do not understand how HIV is transmitted. Although no such statistics exist for the United States, we can assume a percentage of this population is also unsure how HIV is transmitted.

A study by UNAIDS reported less than 50% of young people surveyed in 18 countries had comprehensive knowledge about HIV. In an overwhelming majority of these countries, young women knew significantly less about HIV than young men (UNAIDS, n.d.). Because of

lack of knowledge and inconsistent use of protective measures for HIV, these studies show young people, particularly women and those in rural areas, are at a high risk for HIV infection.

When considering the epidemiologic triangle (agent, host, and environment), the best way to affect HIV transmission, with our current technology, is by breaking the chain between agent and host. There are two ways to stop transmission of the virus: eliminating activities that have been proven to transmit HIV (risk reduction) and using measures that have been proven to reduce the chance of transmission during such activities (harm reduction). Education is the cornerstone for HIV prevention because it gives people the options to protect themselves from infection.

Education related to prevention is necessary for decreasing HIV incidence because the natural history of HIV does not allow for recovery, only death. Early diagnosis is also important for HIV because it is now possible to maintain a healthy life for a longer period of time than ever before. The CDC estimates, of the 1-1.2 million persons in the U.S. that are infected with HIV, one-quarter are unaware of their infection. 54%-70% of new sexually transmitted HIV infections can be attributed to these 25% unaware of their infection (Branson, 2007). By preventing new infections of HIV with prevention education and providing early diagnosis to prevent spread by unknown infected persons, HIV incidence could decrease dramatically.

Ida Township is a rural area of Monroe County, Michigan. Monroe County's HIV infection rate is 32 per 100,000 (Michigan Department of Community Health, 2008), much higher than the national rate of 18.5 per 100,000 (Centers for Disease Control and Prevention, June 9, 2006). Ida High School has no limits on what can be mentioned during HIV education, unlike some other schools in Monroe County. Ida Township, however, has very few resources for HIV testing. The four closest testing sites to Ida are all about a 40-minute drive away. STI testing is available at the Monroe County Health Department, about a ten-minute drive from Ida.

Some public transportation exists between Ida and Monroe (where the health department is located) but none exists between Ida and any of the HIV testing areas. Without personal transportation, Ida community members cannot receive HIV testing services.

Intervention Objectives

A class of 12 Ida High School students was selected to receive an HIV education program intervention. The class included 12 white seniors, 4 of which were male. The intervention was a comprehensive HIV education program designed to not only provide risk reduction options for HIV prevention (i.e. abstinence), but also provide harm reduction options for prevention (i.e. condoms). The rationale for adding harm reduction options to the standard risk reduction options comes from the National Youth Risk Behavior Survey by the CDC, which shows 46.8% of students grades 9-12 had sexual intercourse during their lifetime (Centers for Disease Control and Prevention, 2006). As almost half of American adolescents have had sex, an intervention using only risk reduction is no longer an option.

The intervention aims to increase knowledge of HIV on three domains: cognitive, affective, and psychomotor. The cognitive domain is affected by memory, recognition, understanding, reasoning, application and problem solving. Recognition was started with a pre-intervention questionnaire where concepts were introduced, memory and understanding of the information was tested in a post-intervention questionnaire, and reasoning, application, and problem solving were assessed during student participation throughout the intervention. By informing students about HIV, the intervention hopes to change the affective domain and increase sensitivity to the subject. The psychomotor domain was affected while students actively participated in the intervention by standing in the front of the room and holding signs of different activities or body fluids and their likeliness to transmit HIV (Stanhope & Lancaster, 2004).

Objectives for this intervention include the ability of every student, post-intervention, to list at least one way they could protect themselves from HIV. All objectives are listed in table 1.

Table 1.

Objectives
1. 90% of students can correctly identify the acronym HIV post intervention.
2. 80% of students can correctly the acronym AIDS post intervention.
3. 80% of students can correctly identify the difference between HIV and AIDS post intervention.
4. 100% of students can list four ways to transmit HIV post intervention.
5. 100% of students can identify at least one way to protect themselves from HIV infection post intervention.

Plan for Implementation and Evaluation

After designing an educational program on HIV it was presented to seven senior nursing students and one public health nursing instructor. The students and instructor critiqued the program and appropriate changes were made. Arrangements were made to implement the program to a group of 12 students at Ida High School in Monroe County.

The intervention acts on the level of primary prevention. Primary prevention efforts in public health aim to inhibit development of disease before it starts. The design of the intervention is to take HIV-negative youth and provide them with the knowledge to protect themselves from infection and remain negative for their lives. The intervention also works on a secondary prevention level. Secondary prevention in public health aims for early detection and treatment. Students participating in the intervention are given information on HIV testing for early detection. The intervention also provides a small amount of information on strategies to stay healthy for those who are HIV positive.

The implementation of this program could, at a minimum, take only one person. A contact at the school is important to set up an aggregate for the presentation. The program was

designed with a PowerPoint presentation so a computer and projector are required. The time limit, enforced by class length, is a major limitation to a truly complete education program.

Evaluation

Prior to the intervention the 12 students were given a questionnaire on HIV. Following the intervention the same questionnaire was given to determine the change in knowledge from the intervention. Ten students returned the pre-intervention questionnaire and 11 students turned in the post-intervention questionnaire. Results of the questionnaires are below in table 2. The first two sections of the pre-intervention questionnaire are labeled as having inaccurate data. The students were still in possession of the questionnaire during the beginning of the intervention and they used this learned information on the questionnaire, making it an inaccurate estimate of their original knowledge pertaining to HIV.

Table 2.

Objectives	Pre-intervention (number out of 10 (percent))	Goal	Post-intervention (number of 11 (percent))
Correct identification of acronym HIV	Inaccurate data	90%	10 (90.9)
Correct identification of acronym AIDS	Inaccurate data	80%	5 (45.45)
Correct identification of difference between HIV and AIDS	3 (30)	80%	10 (90.9)
List four ways to transmit HIV	0 (0)	100%	10 (90.9)
Identify at least one way to protect yourself from HIV infection	7 (70)	100%	11 (100)

The most important goal of the intervention was to provide the students with the knowledge needed to protect themselves from HIV infection with risk-reduction methods or harm-reduction methods. Ten of the eleven students to return a post-intervention questionnaire reported abstinence as a method they could use to protect themselves from HIV, seven students

listed safe sex or condoms, five listed not sharing needles, two students listed one partner or limiting partners. Most students, 90.9%, listed risk-reduction methods, abstinence, as a method to protect themselves from HIV. This shows that despite the inclusion of harm-reduction information, students still understand and may use risk-reduction methods. More students identified abstinence as a way to protect themselves from HIV over other harm-reduction methods.

Objective one, correct identification of the acronym HIV, was met, 90.9% of students correctly identified this. Only 45.45% of students were able to identify correctly the acronym for AIDS, most students were able to identify most of the acronym, just not all four words. 90.9% of students could identify the difference between HIV and AIDS, meeting objective three. 90.9% of students could list four ways to transmit HIV, not quite the goal of 100% but an improvement from zero students who were able to list four ways to transmit HIV before the intervention.

The intervention was effective as no student could list four ways to transmit HIV before the intervention and after the intervention 90.9% of students could list four ways to transmit HIV. The students all, after the intervention, could list at least one way they could protect themselves from HIV, the main goal of the intervention. Providing the students with the knowledge to protect themselves from HIV infection was a major strength of the intervention. The active audience participation is also a strength of the intervention. The weaknesses of the intervention include the inability of the program to clearly define the acronym AIDS and its meaning. The time limitations of the program is also a weakness of the program because an hour is not enough to implement a complete HIV education program. A limitation of the study was the small study size, not being able to provide accurate information on the intervention's effectiveness.

If the intervention was to be re-implemented several improvements could be made. More audience participation could improve knowledge retention after the intervention. For long-term knowledge retention, students could be given an HIV fact sheet to refer to at any time after the intervention. It would be ideal if the intervention provider could, before the intervention, evaluate the HIV knowledge of the students with time to tailor the intervention to the specific knowledge needs of the population. Condom use was mentioned several times as a harm-reduction method of HIV prevention. With the current intervention, it is impossible to know if the students understand proper condom use. The effectiveness of the HIV education program could be increased if it included a condom demonstration. The intervention would also be stronger if it detailed protective measures for each method of transmission. For example, the current intervention mentions not sharing needles as a way to prevent HIV transmission. If the intervention went into more detail, about bleach methods for cleaning needles and needle exchange programs, it would be more effective.

Overall the program was very effective in providing the small study group with knowledge relating to the definition of HIV, the difference between HIV and AIDS, and methods of protection from HIV infection. The intervention was mostly effective in providing students with the knowledge of ways to transmit HIV and it was not effective in explaining the definition of AIDS. The most important part of the program was imparting the knowledge of prevention methods so the students possessed the knowledge to protect themselves from this preventable infection.

Resources

Branson, B. (2007). Current HIV epidemiology and revised recommendations for HIV testing in health-care settings. *Journal of Medical Virology*, 79.

Center for Disease Control and Prevention. (2006, June 9). Youth risk behavior surveillance. *Morbidity and Mortality Weekly Report*, 55.

Centers for Disease Control and Prevention. (2006). *HIV and AIDS in the United States: a picture of today's epidemic.* Retrieved March 30, 2008, from http://www.cdc.gov/hiv/topics/surveillance/united_states.htm

Centers for Disease Control and Prevention. (2004). *Fact sheet: HIV/AIDS among youth*. Retrieved April 2, 2008, from http://www.cdc.gov/hiv/resources/factsheets/youth.htm

Michigan Department of Community Health. (2008, January). *Quarterly HIV/AIDS report, Michigan.*

Press Release. (2007, November 30). *Questions and answers on HIV/AIDS*. EUROPA. Retrieved March 25, 2008, from http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/531&format=HTML&aged=0&language=EN&guiLanguage=en

Stanhope, M. & Lancaster, J. (2004). *Community & public health nursing* (6th ed.). St. Louis: Mosby.

UNAIDS. (n.d.). *Keeping the promise: an agenda for action on women and AIDS.*

U.S. Department of Health and Human Services. (2000). *Healthy people 2010*. Retrieved March 25, 2008, from http://www.healthypeople.gov

Yan, A. F., Chiu, Y., Stoesen, C. A., & Wang, M. Q. (2007, December). STD-/HIV- related sexual risk behaviors and substance use among U.S. rural adolescents. *Journal of the National Medical Association*, 99 (12), pp. 1386-1394.