

## The Effect of Educational Program Based on Health Belief Model about HIV/AIDS among High School Students

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### Abstract

**Background:** Considering the importance of learning health knowledge and the need to promote appropriate health attitudes, beliefs and behaviors regarding Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) among school-age people, the aim of this study was to investigate the effect of an educational program based on Health Belief Model (HBM) about HIV/AIDS.

**Materials and Methods:** This quasi-experimental study was performed on 100 male high school students in Fasa, Iran. A sample size of 100 was determined based on the examination of similar literature with 95% confidence interval and 80% test capability. The subjects were divided into two groups of 50 subjects. After administering a pre-test to both groups, only the experimental group was trained based on the HBM constructs on the HIV/AIDS preventive behaviors. Then intervention was followed by group discussion (10-person groups) in 8 sessions each 55-60 minutes. In order to collect information based on Health Belief Model, a questionnaire consisting of 41 questions in three sections was used. Data were analyzed using SPSS version 22.0 software.

**Results:** Educational intervention based on Health Belief Model resulted in meaningful enhancement of the subjects' knowledge, perceived susceptibility, perceived severity, perceived benefits, and perceived self-efficacy ( $P < 0.05$ ). Furthermore, the students' perceived barriers about beliefs related to HIV/AIDS preventive behaviors decreased significantly ( $P < 0.05$ ).

**Conclusion:** According to the results, educational intervention has increased the HIV/AIDS prevention behavior based on Health Belief Model. Therefore, the results of this study can be used in the theory-based intervention strategies to create and modify health behaviors.

**Key Words:** Education, Health Belief Model, HIV/AIDS, Iran, Students.

\*Please cite this article as: Khani Jeihooni A, Arameshfard Sh, Hatami M, Mansourian M, Kashfi SH, Rastegarimehr B, et al. The Effect of Educational Program Based on Health Belief Model about HIV/AIDS among High School Students. Int J Pediatr 2018; 6(3): 7285-96. DOI: [10.22038/ijp.2017.27226.2343](https://doi.org/10.22038/ijp.2017.27226.2343)

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Received date: Nov.14, 2017; Accepted date: Dec.12, 2017

## 1- INTRODUCTION

One of the main disasters in human society since the Second World War has been the pandemic of Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS). HIV/AIDS, which has remained a serious issue throughout the world after nearly three decades since the first case of HIV/AIDS was found. Undoubtedly, there have been few problems in recent decades that are comparable with HIV/AIDS in terms of unexpectedness, complexity, and notoriousness (1-4). Acquired immune deficiency syndrome (HIV/AIDS) is a chronic and progressive illness and the fourth cause of death in the world that has a slow progression weakening the immune system gradually (5-7). It has affected all nations of the world and all sex and racial groups (8-10). According to the World Health Organization (WHO), the rate of infection with the HIV/AIDS virus in Iran will reach 10% by 2020 (11), and the organization believes that the only effective way against HIV/AIDS is health education (12, 13).

Today, various studies have shown that limiting the spread of HIV/AIDS is contingent upon health education to encourage and help maintain behavioral change, which reduces the risk of getting or transmitting the virus. The most successful interventions are those done with a full knowledge of drug use culture and local epidemiology (14-19). Acquiring health knowledge as well as healthy attitudes and behaviors regarding HIV/AIDS starts from school age and because a significant proportion of the population is in the schools, they are key places and ripe grounds for health education and promotion (20). The value of health education programs depends on the effectiveness of these programs (21), which in turn depends largely on the use of an appropriate model for selecting

educational programs and target health problems (22, 23). Health belief model (HBM) is a model widely used in health education (24-26). As a cognitive model developed in the 1950s, HBM is used to identify the factors affecting behaviors and understand the effects of high-risk behaviors on people's health. The model has been applied to topics like smoking, substance abuse, obesity, sexually transmitted infections (STI), and HIV (26-28). HBM is a comprehensive model, which is more effective in preventing diseases. The basis of this model is the individual's motivation to act. It emphasizes how one's perception creates motivation and movement and leads to behavior. In general, this model focuses on a change in beliefs, which in turn leads to change in behavior (28-31). In fact, HBM allows us to examine the beliefs that influence people's decision to adopt preventive behaviors (14, 32).

This model classifies an individual's decision and motivation to adopt a health behavior into three distinct categories of personal perception, moderating behaviors, and the likelihood of adopting an action or behavior. Personal perceptions involve factors, which affect the understanding of an illness or health problem, as well as the outcome of a health behavior. The likelihood of acting is related to factors influencing the likelihood of adopting appropriate behaviors, and moderating or facilitating factors include demographic variables, perceived threat and cues to action and play their role after the emergence of personal perception (33-35). Constructs of HBM include perceived susceptibility, perceived benefits, and cues to action, perceived severity, perceived barriers, and self-efficacy (24, 36). Perceived severity involves the perception of the severity of the disease. Perceived benefits refer to beliefs about the benefits of adopting preventive behaviors. Perceived barriers include beliefs about

negative aspects of preventive behaviors. Perceived self-efficacy includes enough self-confidence in adopting behaviors. Cues to action include reminders that can cause perpetuation of the behavior (23, 37). Based on this model, adopting HIV/AIDS-preventive interventions first requires people to feel the HIV/AIDS infection risk (perceived susceptibility), and the seriousness of its physical, social, psychological and economic complications (perceived severity). Using positive cues from the environment (cues to action), they should believe in the usefulness and applicability of the HIV/AIDS prevention program (perceived benefits) and accept that the deterrent factors of adopting the behavior are less costly than its benefits (perceived barriers), so that the process ultimately lead to adoption of HIV/AIDS preventive behaviors (20).

Various studies indicate that the level of knowledge and attitude of high school students about HIV/AIDS is not desirable (38-40). A study conducted in Tehran based on HBM showed a significant relationship between knowledge and perceived severity, perceived susceptibility, and perceived benefits about the HIV/AIDS screening test (33). Results of another study in Sirjan, Iran, indicated the effect of educational intervention based on HBM on male barbers' knowledge of HIV/AIDS prevention (41). In another study, education using HBM led to an increase in perceived susceptibility, perceived severity, and perceived benefits, and reduction of perceived barriers for adopting HIV/AIDS preventive behaviors among injecting drug users (14). Considering the importance of health knowledge and the need to promote appropriate attitudes, beliefs, and behaviors regarding HIV/AIDS from school age, the purpose of this study was to investigate the effect of educational program based on HBM about HIV/AIDS among high school students.

## 2- MATERIALS AND METHODS

### 2-1. Study design and procedure

This semi-experimental study was performed on 100 male high school students (Second year students of the natural sciences) in Fasa city, Fars province, Iran, in 2016. A sample size of 100 was determined based on the examination of similar literature with 95% confidence interval and 80% test capability. The subjects were divided into two groups, i.e. experimental and control, each consisting of 50 subjects (42). In order to select samples, two schools were randomly selected from among male high schools in the city (one as experimental and one as control group). A 50-student class was selected from each school.

### 2-2. Study Instrument

Students of both groups completed the questionnaires after being informed of the confidentiality. In order to collect information based on HBM, a questionnaire consisting of 41 questions in three sections was used (1, 2).

The first section (7 questions) was about demographic information, the second section was related to knowledge on HIV transmission (11 questions, yes=1 and no=0), and the third section was related to HBM constructs including perceived susceptibility (6 questions), perceived severity (8 questions), perceived benefits (4 questions), perceived barriers (4 questions) and self-efficacy (7 questions), that used a five-point Likert scale (strongly disagree, disagree, no idea, agree, strongly agree; 1 to 5). Validity and reliability of the questionnaire were assessed and evaluated by content validity and test-retest methods, respectively.

External reliability of the questionnaire was assessed using test-retest and correlation coefficient ( $r=0.79$ ), and internal reliability of the questionnaire was calculated by obtaining Cronbach's alpha

coefficients for knowledge (0.83), and for HBM dimensions (0.76), which were statistically acceptable (14, 42). After the pre-test, educational content on HIV/AIDS epidemiology in Iran, HIV transmission, high-risk populations, high-risk behaviors and prevention methods were developed and approved. Then intervention was conducted by the researchers for the experimental group via group discussion, question and answer, and video presentation followed by group discussion (10-person groups) in 8 sessions each 60-55 minutes. At these sessions, first speeches were made to raise knowledge of the subjects allowing them to ask their questions. Group discussion was used to direct subjects towards proper beliefs on the seriousness of HIV/AIDS, their susceptibility to the disease, the benefits and barriers of adopting preventive behaviors, and the reasons for trust in adopting such behaviors. At the end of the educational intervention, a manual was given to these participants. Two follow-up sessions were held one month and two months later. There was no training for the control group. Three months later, the questionnaires were re-administered to

both groups. At the end of the study, the manual was provided to the control group, too. Before participating in the study, the goals and objectives of the study were explained to the participants, who entered the study after providing written consent. Training sessions were held in the classroom. The details of the training sessions are presented in **Table.1**.

### 2-3. Study Ethics

This study was approved by the Ethics Committee of Fasa University of Medical Sciences (ID- code: 96153).

### 2-4. Study analysis

Data were analyzed by SPSS version 22.0 software; and to describe the variables of knowledge, sensitivity, severity, benefits and barriers and self-efficacy, mean and standard deviation were used; to describe qualitative variables the frequency and frequency percentage were used. Also, to compare the mean before and after the same variables the t-test and to compare the intervention group and the control group an independent t-test at a significant level of 0.05 were used.

**Table-1:** The Details of the Training Sessions

Sessions	Details	Time
First session	Introduction to HIV/AIDS and its symptoms, complications and diagnosis.	55
Second session	Prevention of disease, risk factors, symptoms and diagnosis.	55
Third and fourth sessions	Benefits and barriers of prevention of disease, recommendations, self-efficacy in prevention and control of disease.	60
Fifth and sixth sessions	Importance of disease, role of perceived sensitivity and severity.	60
Seventh session	The session was held with the presence of at least one family member and teachers and the role of family members in facilitating of prevention of HIV/AIDS.	60
Eighth session	The previous sessions were reviewed and the subjects were provided with educational pamphlets.	60

## 3- RESULTS

One hundred male high school students aged 16-17 years participated in this semi-experimental study. Forty eight percent of the subjects' mothers (n=48), and 30 percent of fathers (n=30) had elementary

education; 67 percent of mothers (n=67) were housekeepers and 9 percent of fathers (n=9) were unemployed; and 37 percent of the households had a low income, 36 percent had an average income, and 27 percent had a good income. There was no significant difference between the two

groups in terms of demographic variables ( $P>0.05$ ). There was a significant difference in the level of students awareness in the experimental group before and after the training ( $P = 0.001$ ); while there was no significant difference in the control group ( $P = 0.08$ ). Results showed no significant difference between the experimental and control groups in terms of perceived susceptibility, severity,

benefits and self-efficacy before the intervention. However, three months after the intervention, the experimental group showed a significant increase in each of these areas compared to the control group except perceived barriers, which was significantly reduced for the experimental group compared to the control group ( $P<0.05$ ) (**Table.2**).

**Table-2:** The Mean of the HBM Constructs Before Intervention and 3 Months after Intervention in Experimental and Control Groups.

Health Belief Model Construct		Before Intervention	3Months After Intervention	P-value
Knowledge	Experimental Group	6.22±1.21	9.14 ±1.05	0.001
	Control Group	6.55±1.16	7.02±1.08	0.08
	T- test	0.256	0.001	
Perceived sensitivity	Experimental Group	14.15±2.34	26.22±2.29	0.001
	Control Group	13.81±2.66	14.10±2.28	0.312
	T- test	0.114	0.001	
Perceived severity	Experimental Group	17.24±3.68	33.65±3.68	0.001
	Control Group	16.77±3.82	17.00±3.88	0.164
	T test	0.148	0.001	
Perceived benefits	Experimental Group	10.08±2.23	17.27±2.01	0.001
	Control Group	10.72±2.19	11.25±2.35	0.238
	T- test	0.133	0.001	
Perceived barriers	Experimental Group	16.21±2.18	11.14 ±2.06	0.001
	Control Group	15.85±2.10	14.97±2.04	0.08
	T- test	0.349	0.001	
Self-efficacy	Experimental Group	16.56±2.15	26.31 ±2.65	0.001
	Control Group	16.96±2.44	17.26±2.46	0.109
	T- test	0.212	0.001	

Data are presented as mean ± standard deviation.

#### 4- DISCUSSION

Considering the importance of health knowledge and the need to promote appropriate attitudes, beliefs, and behaviors regarding HIV/AIDS from school age, the purpose of this study was to investigate the effect of educational program based on HBM about HIV/AIDS among students. This study was performed on 100 male high school students were divided into two groups, i.e. experimental and control, each consisting of 50 subjects; then intervention was conducted by the researchers for the experimental group via

group discussion, question and answer, and video presentation followed by group discussion (10-person groups) in 8 sessions each 55-60 minutes. In general, the inadequacy of students' knowledge about AIDS and the need to refine their attitude towards this issue has been confirmed in most researches. Therefore, the awareness of students about the risks of AIDS transmission and prevention is very important because awareness and knowledge will affect their behavior. On the other hand, through health education, negative attitude toward AIDS can be

changed. Assessments from different communities show that the level of knowledge and awareness of students about HIV is very different; on the other hand, the inadequate understanding of the disease and its transmission routes, as well as false beliefs associated with AIDS and the ways of its transmission can disrupt the prevention process. The results of this study revealed that knowledge level of the students in the experimental group before and after the intervention had a significant difference. This change reflects the effect of educational intervention on increasing the students' knowledge. This finding is consistent with the results of Pirzadeh and Sharifirad (20), Sharif Zadeh et al. on female students in Birjand (43), Babaei et al. in Mazandaran (44), and Sharifi Rad et al. (45). The results of this study showed that education based on HBM raised perceived severity, perceived benefits, perceived susceptibility, and perceived barriers among the students.

Perceived susceptibility construct in the experimental group showed an increase after the intervention that was statistically significant. This finding is not consistent with studies in this area based on HBM, such as that of Pirzadeh and Sharifirad (20) and Ghaffari et al. (46), but it is consistent with many other studies, including Rahmati et al. (33), Karimi et al. (14), and Sharifi Rad et al. (43). Results of Sadeqi et al. (47), Vakili et al. (48), as well as Aghmolayi et al. (49), also showed the significant effect of HBM on the perceived susceptibility. Baghiani Moghadam et al. (50) found a significant difference between the mean scores of perceived susceptibility and knowledge and the students' educational field. On the other hand, the significant negative correlation between perceived severity with knowledge and perceived susceptibility in the study showed that students, who do not perceive the susceptibility and seriousness of a health problem like HIV/AIDS, may not

adopt preventive behaviors. Findings of the present study indicated that before the educational intervention, many of the participants were unaware of the risk of HIV/AIDS, so that their mean perceived susceptibility score was 14.15 before intervention and 26.22 after intervention. This lack of knowledge can reduce their sensitivity towards preventive behaviors and increase the risk of HIV/AIDS for them. Based on the HBM, high perceived sensitivity is necessary to increase the motivation of individuals to adopt preventive health behaviors. Therefore, part of the HIV/AIDS educational programs should focus on this construct. If a person is sensitive to a health problem and believe that he/she can have the disease without symptoms, this susceptibility can lead him/her to avoiding high-risk behaviors and preventing HIV/AIDS transmission (14). It seems that the way of conducting training through group discussion, question and answer, films and lectures used in this research could also affect the perceived susceptibility of the subjects and part of the increase in the mean score of this construct in both groups could be due to this method.

In the case of perceived severity, the results of this study are similar to those of perceived susceptibility construct with the difference that in both intervention and control groups, the mean score of the aforementioned construct was significantly higher in the pre-intervention phase compared with the perceived susceptibility constructs. One of the reasons for using HBM for HIV/AIDS is the fatal consequences of this disease so that people perceive it as a lethal disease. It is noteworthy that the subjects studied, despite having a lower perceived susceptibility, had a higher perceived severity. It means that though they consider HIV/AIDS to be a disease with severe consequences, but did not consider

themselves to be at the risk of being infected with the disease. However, this finding seems to be somewhat realistic given the characteristics of the studied community. One of the most important factors in people's exposure to specific health conditions is their lack of belief in their vulnerability to those conditions. In this study, perceived severity in the experimental group showed a significant increase after intervention over other HBM constructs but it was not significant in the control group. Although it is possible that students perceive themselves as less exposed to the disease, they still consider the disease to be fatal and with serious complications. Finally, it can be said that training was successful in increasing their perceived severity of the disease that is consistent with the findings of Pirzadeh and Sharifirad (20), Karimi et al. (14), Azaretal et al. (51), and Mirahadi et al. (52). This higher perceived severity of HIV/AIDS can be positive as it can be beneficial in adopting preventive behaviors and changing health beliefs. People's perception and their evaluation of the danger are pivotal in application of the HBM; therefore, perceived severity should be developed as an important factor in shaping the behaviors in which weakness exists (53).

The implementation of the educational program could significantly increase the perceived benefits in the experimental group. Perception of the benefits of HIV/AIDS preventive behaviors was one of the positive characteristics of the study group. The effectiveness of training in increasing perceived benefits of HIV/AIDS preventive behaviors was also supported in other studies (31, 52, 54- 57). In the present study, the mean score of self-efficacy in the experimental group increased significantly after training. The students' belief in the ability to properly handle HIV/AIDS-related health behaviors can be effective in promoting the level of

self-efficacy of the community. The more they trust in their own ability to conduct health behaviors, the more they adopt those behaviors. There was a significant correlation between perceived benefits, and perceived self-efficacy indicating that people with greater perceived benefits have a higher perceived self-efficacy. Bandura defined self-efficacy as a person's confidence in his ability to successfully complete an action (58). A study in Turkey showed that self-efficacy and health motivation are two important components of the HBM and are stronger predictors of breast self-examination in women than other components of the model (59). The results of similar studies also show the effect of HBM-based education on the increase in the mean score of self-efficacy (32, 52, 57-64).

There was a significant decrease in the average perceived barriers score after educational intervention showing a significant difference between the two groups. This can be attributed to the positive effect of training on the elimination of perceived barriers in the experimental group. Promoting knowledge and correcting misconceptions through discussion can be effective in reducing perceived barriers. Pirzadeh et al.'s study in Isfahan showed that education using the HBM had a significant role in reducing perceived barriers of HIV/AIDS prevention among female students. Educational intervention has also been effective in reducing perceived barriers of influenza prevention (20). Sadeghi et al.'s study in Sirjan, Iran, also showed similar results in this regard (41).

## 5- CONCLUSION

Considering the lack of information and awareness among students about AIDS, the importance of this disease in the community, the need for more attention to it at school level and the negative effects of ignorance on AIDS epidemic, it is

suggested that part of the AIDS information be included in students textbooks. It is also suggested to provide more information to students through mass media, discussions between students and teachers and parents. AIDS affects the young population more often. By eliminating the most productive group of society, AIDS will have a significant impact on this group of people, affect the functioning of societies and social capital and will undermine all sectors of society. In general, it makes many problems with sustainable development. Therefore, preventing the spread of this disease will be a major service to the country in promoting community health and sustainable development.

Choosing the right educational strategy to raise awareness among students as young people and the future of society and getting information up-to-date is one of the most effective and cost-effective interventions to prevent AIDS. In one hand students, as the main focus of trainers and trainees in families and society, are very influential in preventing this important disease and on the other hand, with the help of education, risky behaviors of students can be changed or modified before they can be established, or healthy and hygienic behaviors can be created in these individuals. Educational intervention based on health belief model has been shown to increase the preventive behaviors of AIDS. Therefore, improving perceived susceptibility, perceived severity, perceived benefits and perceived self-efficacy and reducing perceived barriers related to adoption of HIV/AIDS preventive behaviors among the participant students can be attributed to the positive impact of education based on HBM. The results of this study can be used in theory-based intervention strategies to create and modify health behaviors. Based on the present study, it is suggested that AIDS-related education and high-risk behaviors

be more widely used in schools, using other health education and health promotion models to change student behavior in preventing AIDS.

**6- CONFLICT OF INTEREST:** None.

## **7- ACKNOWLEDGMENTS**

We are grateful to school teachers and primary school male students for their cooperation. This research has been supported by Fasa University of Medical Sciences.

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