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Preventing HIV Transmission among the Opiate-Dependent Population in Zarandieh: Evaluation of the HBM-Based Educational Programs

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Abstract

Aims: Drug users form the main HIV-affected group in Iran. About two-third of all the individuals affected by HIV in Iran are those who use drug through injection. The aim of this study is to determine the effect of health belief model (HBM) on prevention of HIV transmission among the opiate-dependent population in Zarandieh.

Methods and Materials: This is a quasi-experimental intervention study carried out on 49 addicted men in Zarandieh. was collected using a questionnaire, based on HBM and the group completed the questionnaire. According to the pre-test, the educational intervention was designed and implemented. Three months after the intervention, the post-test was performed and analyzed using the primary questionnaire and $\chi 2$, T-test.

Findings: The findings indicated that the mean scores of HBM Model constructs (self-efficacy, susceptibility, severity and benefit) increased significantly after intervention and the perceived barriers decreased ($p< 0.001$). Also, the history of HIV testing reported 8%before intervention, while the rate increased to 48.6% after intervention.

Conclusions: This finding provides initial support for designing and implementation of health education program, based on the HBM on Preventing HIV transmission among Opiate-dependent population.

Key words: Health education, AIDS, Health belief model

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Introduction

Since the outbreak of AIDS in 1981, about 60 million individuals have been infected by HIV-related symptoms and 25 million died (1). Drug injection and high-risk sexual behaviors are the key contributing factors to the transmission of the human immunodeficiency virus (HIV) (2). In Islamic republic of Iran, drug injection users are the main group affected by sex transmitted diseases (STDs) or HIV. About two-third of the individuals who get infected with sex transmitted disease (STDs) or HIV, are drug injection users (3). The World Health Organization (WHO) estimated that 80,000 infected individuals live in Iran; but just a one-fourth of the patients have been identified in June 2011. It was reported that 69.8 percent of the cases were infected through using shared needles, and only 10 percent by unprotected sexual relationship, and 10 percent through sexual relationship. The cause of about 18.3 percent of cases remains unknown (4).

Health behavior change is our greatest hope for reducing the burden of this preventable disease and death around the world (3). However, several health education models, including HBM were applied to change health behavior or to plan programs for HIV prevention (5). According to Yep and Cooper et al.(2001) the HBM is more practical than any other model in examinations and screening behavior among the Asians, because of the positive relationship between many of the constructs and the desired behavior(3). The HBM hypothesizes that AIDS-protective behavior decisions are function of the perceived risk of contracting the disease, perceived severity of the disease, and perceptions of benefits and barriers to specific AIDS-protective behaviors(6). The HBM suggests that for individuals with exhibit high-risk behaviors, the perceived susceptibility is necessary before commitment to change these risky behaviors. For individuals who do not believe that they are at risk, the benefits or barriers to an action are irrelevant. Self-efficacy has been studied in relation to HIV-protective behaviors and defines an individual's perceived ability to carry out a behavior believed to be necessary to prevent infection with HIV (5). The purpose of this study was to assess the effect of the preventive intervention based on the HBM, on HIV transmission among the Opiate-dependent population of Zarandieh.

Methods

The present study is a quasi-experimental performed on 49 addicted males who had referred to the Tavalodi Dobareh (Reborn) Association (TDA), in the fall 2011. With respect to the limited amount of the subjects, all the addicted males (n=51) in the TDA were invited to participate in the study. Of the 51

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addicted males invited to participate, 49 participants completed the survey. The TDA is located in Zarandieh, Markazi Province-Iran. The Province consisted of 12 cities. The Zarandieh is in north of Markazi Province and her population is 62000 inhabitants, the fifth top populated city of the Province.

were collected using self-report questionnaire derived from the literature. It contained 55 items and consisted of two parts:

1. Demographic characteristic questionnaire consisted of 10 items to elicit personal information: age, educations, marital status, drug use, the first usage age, occupation, settlement, income, history of condemnation and history of venereal diseases.

2. HIV Knowledge: HIV knowledge was assessed using DiClemente's AIDS Knowledge scale, a 15-item instrument with a dichotomous response option of "yes" or "no" to various statements on prevention and transmission of the AIDS virus, derived from the available literature (7). Each correct answer was given 1 score and each incorrect answer 0. The maximum score of the knowledge was 15. Higher scores indicate higher level of awareness and the total scores was categorized conventionally in three groups of desirable (10-15), intermediate (5-9), and weak (0-4).

3.HBM questionnaire: This part contained 32 statements, derived from the available literature (2, 3, 7, and 8). Each statement is ansswered with one of the three options(agree/not sure/disagree), included of: A five-item scale to assess perceived susceptibility, a five item scale to measure perceived seriousness, a 10-item scale to assess perceived benefits and barriers, a five-item scale to measure self efficacy, a 1-item scale to assess cues to action and preventive behavior was measured using 6 items.

The HBM constructs toward HIV rated on a 3-point scale ranging from 0 (disagree) to 2 (agree). In the preventive behavior section, the total scores were categorized conventionally in three groups of desirable (5-6), intermediate (3-4), and undesirable (0-2).

The questionnaire psychometry was conducted using content validity and Cronbach's Alpha coefficient. Designing and revision of questionnaire (using valid relevant references), the expert's panel measured the validity rate and index.

After pretesting, the results of the study were applied to assemble the intervention. The suggested educational program consisted of 4 sessions; each session 2 hours included group discussions, lecture, role playing and film display. The educational program included 4 sessions which lasts 2 hours using group discussion, lecture, role playing and film. Then, the study group were exposed to the health

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education program as intervention, based on which the preventing from AIDS behaviors are: feeling danger against the problem (being suffered from AIDS), perceiving danger (perceived sensitivity), perceiving the depth of danger and seriousness of its various effects on one's physical, mental, social, and economical affairs (perceived intensity), receiving positive confirmation from the environment or internal environment (action cues), believing in efficiency and applicability of the behaviors (perceived benefits), and finding out and comparing the benefits of preventing elements versus the costs of the behaviors (perceived obstacles); so that one finally decides to perform the preventing behaviors. Three months after intervention, the relating to the knowledge, the dimensions of the HBM and the preventive behavior were collected using the same questionnaires (post-test) and analyzed using the Statistical Package for the Social Sciences (SPSS version 16.0.). Statistical significance was determined at the $P < 0.05$ level (T-test, paired t test, correlation, ANOVA and regression were applied for analyses).

Ethics

All participants signed the informant participation letter. Participants were asked to announce their verbal informed consent to insure privacy.

Results

49 addicted men were included in the study. The mean age of participants was 24.8±1.35 years, aged from 18 to 49. Majority of the participants (61%) were young (25-29) and (93%) educated: (41/5% high school certificate, 48% post- diploma, 3/2 % post-graduated , and just 7% were illiterate). Content Validity Index (CVI) and Content Validity Rate (CVR) of the questionnaire were 0.82 0.9, respectively. Reliability of the questionnaire was investigated using test re-test method. Cronbach's alpha for knowledge, the dimension of HBM and practices were 83%, 76% and 75%, respectively.

The ANOVA test found a significant relation between the educational level and knowledge ($p< 0.0001$), but the educational level did not have any significant relation with behavior. Findings showed that 43% of the participants had good knowledge and 35% had intermediate knowledge. However, only 18% had good practice, 40% intermediate and the remaining had weak practice (tables 1 and 2).

Paired t-test between the mean of knowledge and practice before and after the education showed a significant difference ($p<0.0001$) (table 1 & 2).

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Table 1: Mean scores of knowledge (absolute & relative frequency distribution) before and after the educational intervention

Grade	Intervention			
	Before		After	
	No	%	No	%
Weak (0-4)	11	22	6	12
Intermediate (5-9)	18	36	20	41
Desirable (10-15)	21	42	23	47
Total	98	100	98	100
Mean and SD	9.7±2		11.6±2.2	

Table 2: Mean scores of practice (absolute & relative frequency distribution) before and after the educational intervention

Grade	Intervention			
	Before		After	
	No	%	No	%
Weak (0-2)	21	42	14	29
Intermediate (3-4)	19	40	24	47
Desirable (5-6)	9	18	11	24
Total	49	100	49	100
Mean and SD	2.4±1.1		0.9±3.8	

Table 3: Reported prevalence of HIV high-risk behaviors

	Yes		No	
	N	%	N	%
Needle sharing	14	29	35	71
Having extra-marital sex	15	31	34	69
Tattooing with shared needles	6	12	43	88
Using a condom when having sex	9	18	40	82
Using a shared razor	17	35	32	65
History of HIV testing	4	8	45	92
History of drug injection	16	33	33	67

Findings about the most important factors are respectively as follows: friends and relatives (51%), radio and television (33%), newspapers and magazines (12%), health care staffs (12%), and book (7%).

As table 3 illustrates, 33% of the cases reported to have drug injection experience, 12% Tattooing with shared needles and 31% unsafe and illegal sexual contact that from this numbers 96% had unprotected sexual contact

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and none of them was informed about HIV/AIDS contamination of their sexual partners. Also 8% of the cases reported their visit of physicians because of venereal diseases. Before educational program 8% reported a history of HIV testing, while 92% had never been tested. Among those who had tested, the majority (98.1%) had one test in their lifetime. Additionally, the most common reasons reported for obtaining an HIV test included "Health care provider" (89%) and sexual transmitted diseases (STDs) (7%). The after educational program HIV test rate reached to nearly half (48.6%).

The results showed a significant difference among the mean scores of the perceived susceptibility, perceived seriousness, perceived benefits, barriers and self-efficacy, before and after the educational program (p< 0/001) (table 4). The result obtained from multiple regression analysis revealed that all HBM components were significant predicting factors for preventive behaviors. The findings showed that self efficacy (ß = 0.36, p < 0.00l) was the strongest predictor of preventive behavior, followed by the perceived Susceptibility (ß = 0.32, p < 0.01) and perceived barriers (ß = 0.27, P < 0.0l) (table 5).

Table 4: Means & Standard Deviation of the health belief models' constructs before and after the educational intervention

Constructs	Intervention				
	Before		After		
	Mean	SD	Mean	SD	P Value*
Perceived Susceptibility	4.43	0.32	7.15	0.41	0.0001
Perceived Seriousness	7.15	0.35	9.01	0.32	0.0001
Perceived Benefits	3.35	0.29	6.72	0.33	0.0001
Perceived Barriers	6.92	0.33	4.01	0.28	0.0001
Self efficacy	4.25	0.85	7.10	0.45	0.0001
Cues to Action	2.10	0.27	3.61	0.24	0.0001

*using paired t test

Table 5: Results of the multiple linear regression analysis

	Standardized β	95% CI for β	P
Perceived Susceptibility	0.32	0.15-0.57	<0.01
Perceived Seriousness	0.21	0.17-0.45	<0.001
Perceived Benefits	0.14	0.07-0.31	<0.001
Perceived Barriers	0.27	0.18-0.34	<0.01
Self Efficacy	0.36	0.20-0.86	<0.001

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Discussion & Conclusion

In this study, the applicability of the intervention based on the HBM was examined to prevent HIV transmission among Iranian Opiate-dependent population. The results of the present study indicated that the health education program designed based on the HBM had a significant effect on the AIDS preventive behaviors in Zarandih's Opiate-dependent population through improvement of the knowledge level and positive effect on the perceived sensitivity, intensity, threat, perceived benefits and barriers and self efficacy. Similar findings have been reported in other studies. For instance, studies of Lollis in the USA (6), Volk in Kenya (9), Rahmati (7) and Ghaffari (8) confirm the results of this study.

Findings of this research show that although of 43% of the participants had good knowledge about AIDS and preventing approaches, 42% of them had a weak practice. According to the investigators having information and knowledge is not enough for adopting preventive behaviors, but the way of thinking and attitude toward a disease is an important factor in doing or not doing a preventive action(3). Researchers such as De Vise (10) and Jones and Haynes (11) have explored that most individuals, regardless of their culture, exhibited a high level of knowledge about STDs/HIV; however they tended to exhibit a propensity toward engaging in risky sexual behaviors, including having unprotected sexual intercourse with multiple partners. In this study, 33% of the cases had drug injection experience, 31% had the experience of risky sexual behaviors and used condom rarely. A study of Maher in Bangkok showed that the main factor of accelerating HIV infection distribution in injector addicted people was lack of access to the sterile injecting instruments which led to sharing the syringe and needle among the addicted people (12).

Consistent with the other studies (7, 8, and 13); the present study indicated that health education programs effect on improving the participants' knowledge and preventive behavior in relation to AIDS. However according to the researchers' opinions, informing about the transmission ways and preventing measures of HIV, and the clients' acceptance aimed at changing the risky behaviors and may lead to decrease of HIV transmission(13).

In our study, many of the dubjects did not find themselves at risk of HIV/AIDS infection before the educational intervention, so that the mean of perceived susceptibility before the intervention was 4.43. this dilemma may reduce their precision and sensitivity to do cautious behaviors and exposed many people to HIV/AIDS infection risk. On the other hand, the findings indicated that the participants had a low perception of their own vulnerability of

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HIV infection; similarly a study by Lewis & Malow showed that most college students who engage in sexual relationships have a tendency to perceive themselves as invulnerable to contracting sex transmitted disease (STDs) and do not feel any necessary behavioral changes(14). Our results also indicated that seriousness mean was 7.15 before the intervention perceived. This issue denotes a good perceived intensity before educations that is, the participants have a good knowledge about this risk, because of existing educationnal programes and the tupe of training in our society. They know that AIDS is a dangerous and incurable disease. Maher's research in Bangkok revealed that 95% of the addicted people believed the same and 100% knew the possibility of a suffering death (12). Rahmati's investigation showed that most of the students are sensitive to AIDS as a serious disease (7). study of Iriyama in Nepal showed that the students with high scores in perceived severity of HIV/AIDS had strong intentions to abstain from sexual activity(15).

Also, Lollis et al. studied the American students and showed that there was a direct relation between the amount of perceived threat and using condom (6). The study of Lin among the Taiwanese immigrants also showed that there was a significant relation between the severity and perceived threat of AIDS and the reduction of risky behaviors (16).

The findings of the present study showed that there is a significant difference between the means score of the perceived benefits and barriers, before and after the educational program. Fortunately, previous studies have shown a strong relation between the perceived benefits and adopting preventive behaviors and the individual's perception of the benefits which could facilitate the carry out a behavior (17). Lollis also believes that a relation exists between the individual's attitudes toward the advantages of using condom and AIDS prevention (6). Volk's investigated the subject in Kenya. With an analytic outlook to the findings, the barriers of adopting preventive behaviors can be summarized as: lack of access to disposable syringe and condom when needed, fear of being morbid and punished by the family in the case of HIV diagnosed(9). According to Hounton's investigation in Benin's rural areas, among the main barriers of using condom were the lack of access and tendency when having risky behaviors (18). Eshrati and et al. also showed that the prisoners' right perception to perceived barriers and benefits may affect on the reduction of high-risk behaviors relating to HIV/AIDS (2). Karimy's study showed that self-efficacy, safe sexual consultation, and perceived barriers are the main variables of using condom and safe sexual behaviors (3). Considering the above-mentioned findings, planning and implementation of

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educational programs seem to be necessary to amend the beliefs of drug users.

In the present study, the regression analysis suggested that self-efficacy was the strongest predictor of preventive behavior. Consistent with our findings, Mutinta and Simuzoshya suggested that self-efficacy had the highest impact and association with the use of condoms (19). Similarly Lyon et al. concluded that the participants who had a low self-efficacy for sustaining a single-partner relationship had a propensity toward being involved in multiple-partner relationship (16); it justifies the relation between low self-efficacy and high risk behaviors. However, this study may help health educators who committed to develop HIV education and preventive programs aiming at considering negotiation and communication skills to increase the self-efficacy role in refraining from risky behaviors.

Conclusion

with regard to the findings of this study, it seems that HBM has a critical role in health behavior research; it highlights individuals' understanding of perceived susceptibility, self-efficacy, perceived severity, perceived benefits, perceived barriers, and cues to action leading to preventive behaviors. Similar interventions based on the other theories and models of behavior change are suggested for removing the barriers of the preventive behaviors.

The present study had several limitations: first, it relies on self-completion of the questionnaires, the accuracy of reporting in this study is not ensured; however, the participationts were agiven enough space for completing the questionnaires in order to ensure their privacy. Furthermore, responses to the questionnaires were anonymous in order to maximize accurate self-disclosure. Second, this study was a quasi-experimental without (before and after) control group.

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