

Does the theory-driven program affect the risky behavior of drug injecting users in a healthy city? A quasi-experimental study

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Abstract

Background: The horror of HIV/AIDS as a non-curable, grueling disease is a destructive issue for every country. Drug use, shared needles and unsafe sex are closely linked to the transmission of HIV/AIDS. Modification or changing unhealthy behavior through educational programs can lead to HIV prevention. The aim of this study was to evaluate the efficiency of theory-based education intervention on HIV prevention transmission in drug addicts.

Methods: In this quasi-experimental study, 69 male drug injecting users were entered in to the theory-based educational intervention. Data were collected using a questionnaire, before and 3 months after four sessions (group discussions, lecture, film displaying and role play) of educational intervention.

Results: The findings signified that the mean scores of constructs (self-efficacy, susceptibility, severity and benefit) significantly increased after the educational intervention, and the perceived barriers decreased ($p < 0.001$). Also, the history of HIV testing was reported to be 9% before the intervention, while the rate increased to 88% after the intervention.

Conclusion: The present research offers a primary founding for planning and implementing a theory based educational program to prevent HIV/AIDS transmission in drug injecting addicts. This research revealed that health educational intervention improved preventive behaviors and the knowledge of HIV/AIDS participants.

Keywords: Drug abusers, Addiction, Substance, Preventive Health Education.

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Introduction

Nowadays, injecting drug use is a destructive issue for every country. It is estimated that 16 million people inject drugs around the world. The fastest progressive increase of epidemics is related to HIV that is largely being driven by injecting drug use particularly in Asia (1).

According to the report of the United Nations Office on Drugs and Crime (UNODC), drug use is one of the serious challenging issues in Iran. Drug use is closely linked to both the transmission of HIV and high rates of imprisonment. Based on this report, there are over 1,325,000 opiate dependents and drug users in the coun-

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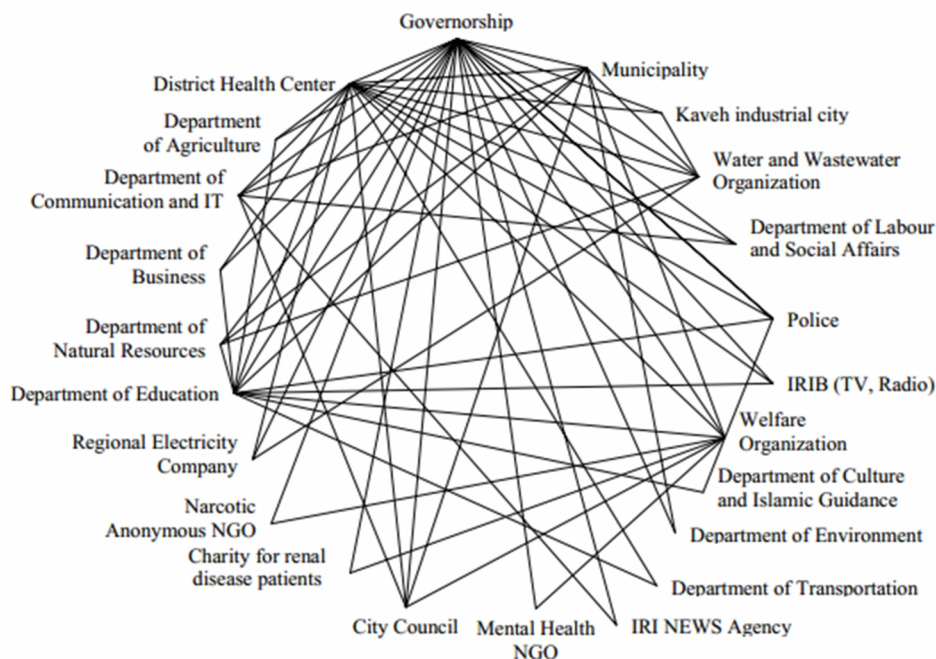
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try (2.26% of the adult population), placing Iran among the countries with the highest prevalence worldwide (2,3). Recent (2013) estimation of the Joint United Nations Programme on HIV and AIDS (UNAIDS) revealed that 47,000 - 110,000 people live with HIV, with prevalence rate of 0.1% in adults aged 15 to 49 in Iran (4). Activities such as drug use, unsafe tattooing and unsafe sex in victims, put these individuals at high risk of acquiring HIV and Hepatitis C (2). Also, shared needles infected cases were estimated 69.8% of which only 10% were infected by unprotected sexual relationship, 10% through sexual relationship and 18.3% through an unknown cause. Drug injecting users are the main group affected by sexually transmitted diseases (STDs) or HIV. In this country, about two-third of the individuals who were infected by STDs or HIV are drug injecting users (5,6). A project named "Healthy Cities", which started in 1986 in developed countries (i.e., Canada, USA, Australia, and many European nations) aimed to create a health-supportive environment and achieved a good quality of life and supply access to health care as the first Healthy Cities Programs (HCPs) (7); then 17 devel-

oping countries joined this program (8). Islamic Republic of Iran (IRI) started its HCP in 1991 (9,10). Saveh was selected as one of the cities for implementation of this project in Eastern Mediterranean Regional office of the World Health organization (EMRO) (11). Saveh with population of 238,000 over an area of 10,279 km² (12), is situated in central part of Iran near Tehran (120Km), for which HCP was started in 1996(9). At least 27 members such as Saveh University of Medical Sciences (SUMSc) and Narcotic Anonymous NGO (NA-NGO) participated in this program (13). Schematic map of relationships in Saveh Healthy City is presented as follows (Map 1).

The modification or changing of unhealthy behavior to reduce the load of morbidity and mortality of the involved participants has been our ultimate goal as academic members of SUMSc in Saveh HCP.

Several health behavior theories applied to changing health behavior or planning programs for HIV prevention (14). Because of the positive relationship between many of the concepts and the desired behavior, the health belief model (HBM), among these theories, is an applicable tool for exami-



Map 1. Schematic map of relationships in Saveh Healthy City

nations and screening behaviors in the Asians (15,16). According to this model, 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 (17). This HBT proposes that for persons who show high-risk behaviors, the perceived susceptibility is essential before obligation to change these risky behaviors. However, for those who do not believe that they are at risk, the benefits or barriers to an action are irrelevant. Self-efficacy has been considered in relation to HIV-protective behaviors and defines an individual's supposed ability to perform a behavior believed to be essential to prevent infection with HIV (18). Dependency between unsafe drug injecting activates, HIV infection and spread of HIV among community represent a serious potential source of HIV infection for the marital and non-marital sexual partners (2,19). UNODC argued that although Iran is a pioneer country in the fields of opium substitution therapies, HIV prevention and treatment of AIDS and successful HIV prevention and treatment programs, still there is an urgent need for the quantitative and qualitative expansion of the existing programs as well as introduction of new programs for a proper response to the problem of HIV and drug use in the country (2). Therefore, we decided to conduct this study to evaluate the efficiency of theory-based education intervention on HIV prevention transmission in drug addicts in Saveh.

Methods

Seventy- three males admitted to single gender Saveh rehabilitation center of addicted Volunteer NA-NGO were entered to our quasi-experimental study. Inclusion criteria were voluntary participation and no previous course participation. Exclusion criteria included senility (>59Y/O), absence in courses (>2 session), self-decision to discontinue, early probable discharge from the center. Finally, 68 participants complet-

ed the survey. Our instrument for data collection consisted of two sectional questionnaires (20,21). For ethical considerations, a number was assigned to each participant instead of a real name. The first section included basic data such as age, name of the drug, drug starting age, job, revenue, education, marital status, settlement, past venereal disease; and the second section assessed HIV knowledge using DiClemente's AIDS Knowledge scale (22), which has recently been used in other studies (20,23) . This scale was a 15-item instrument with a dichotomous response option (yes/no) to several statements on the prevention and transmission of HIV/AIDS. One point was assigned to a true answer and 0 to a false; in total, there were 15 points for all items. The collected data were categorized in desirable, intermediate and weak levels (10-15,5-9,0-4), respectively. Then, the HBM questionnaire was applied as the most frequent used instrument in this field (5) with 32 statements which may be responded with one of these options: agree/not sure or disagree. This questionnaire composed of 7 parts: the first section was a 5-item scale to assess perceived susceptibility, the second section was a 5-item scale to measure perceived severity, the third section was a 10-item scale to assess perceived benefits and barriers, the fourth section was a 5-item scale to measure self-efficacy, and the sixth section was a one-item scale to assess cues to action and preventive behaviors, which were measured using six items. The HBM constructs related to HIV were rated on a 3-point scale and ranged from 0 (disagree) to 2 (agree). In the preventive behavior part, the total scores were categorized conventionally in three groups of desirable (5-6), intermediate (3-4) and undesirable (0-2). The content validity of the questionnaire was determined by a panel of reviewers. Ten expert professors confirmed the questionnaires that had been previously designed in accordance with the HBM and with certain reliable scientific sources (24,26). The professors were asked to evaluate the quality of the tools in terms of grammar, appropriate wording, order of

items and scoring. Then, the ambiguities and problems were resolved. A panel of ten experts helped to assess the content validity by means of a quantitative method in which two coefficients of Content Validity Ratio and Content Validity Index were used in accordance with the Lawshe table (27) that confirms a content validity ratio if it is over 0.62 and a content validity index if over 0.79. To determine the internal consistency of the instrument items, the Cronbach's Alpha formula was applied to measure the reliability of the questionnaire. The results revealed the reliability rates, which were in an acceptable level (0.76).

Intervention of the study was made by analyses of per-test findings. According to these guidelines, an educational plan consisting of 4 two-hour sessions were established; each session composed of group discussions, lecture and film followed by role play. Then, the participants were entered to the health educational program as an intervention, based on which the preventive behaviors were: feeling hazard against the problem (HIV/AIDS involvement), perceiving hazard (perceived sensitivity), severity and depth of hazard perceived by participants and its effects on one's physical, mental, social and economical domains (perceived intensity), positive signals received by external as well as internal environment (action guide), believing the applicability and usefulness of behaviors (perceived benefits) and outcome of cost – benefit assessment of preventing measure or conducting behaviors (perceived obstacles) that could lead to deciding to perform preventive behaviors. In the post-test (3 months later), the HBM dimensions and the preventive behaviors were assessed using the same questionnaires, and the collected data were analyzed using SPSS 16. Statistical significance was determined at $p < 0.05$ (T-test, paired T-test, correlation, ANOVA and regression).

This study was conducted after approval by the Ethics Research Committee of SUMSc with Code No. 1491. In addition; and informed consent was obtained from each participant. All participants signed an

informed consent and were assured that their information would remain private and would be analyzed anonymously. Questionnaires were completed in approximately 30 minutes.

Results

About 72% ($n = 50$) of the participants were young with the age range of 25-29 Y/o, and the mean (\pm SD) age of 25.5 (± 2.75) years (range: 19-51 years); of the participants, 89% ($n = 61$) were educated (ranging from reading-writing to a graduate level). Content Validity Index (CVI) of 0.84 and Content Validity Rate (CVR) of 0.90 were obtained for the questionnaire. Test re-test reliability was done for the questionnaire. Cronbach's α results for knowledge, the dimension of HBM and practices were 81%, 75% and 74%, respectively. The ANOVA test results revealed a significant relation between educational level and knowledge ($p < 0.001$), but no significant difference was observed between educational level and behaviors. Among participants, 38% ($n = 26$) had intermediate and 42% ($n = 29$) had good knowledge. However, only 20.5% ($n = 14$) had good practice, 42.6% (29) intermediate and the remaining had weak practice. Moreover, paired t-test revealed a significant difference ($p < 0.001$) between the mean of knowledge and practice in the pre-post of the intervention (Tables 1 and 2).

Findings about the most important factors for action guide (External) are as follows, respectively: friends and significant others (49%), radio and TV (29%), newspapers and magazines (13%), health care staffs (11%) and books (8%).

Before the educational program, past history (Hx) of drug injection was found in 24 participants (35%), 20 were infected through tattooing with common/suspicious appliance (29%), and 26 (38%) were infected through dangerous or non-marital sexual contact with multiple partners; of this number, 94% had unprotected sexual activity and none of them was aware of HIV/AIDS contamination of their sexual

Table 1. Frequency distribution of knowledge before and after the educational intervention

Grade	Intervention	
	Before No (%)	After No (%)
Weak (0-4)	14 (21%)	7 (10%)
Intermediate (5-9)	26 (38%)	30 (44%)
Good (10-15)	28 (41%)	31 (46%)
Total	68 (100%)	68 (100%)
Mean and SD	8.6±4	9.9±3.4

(p<0.0001)

Table 2. Frequency distribution of practice before and after the educational intervention

Grade	Intervention	
	Before No (%)	After No (%)
Weak (0-2)	25 (37%)	12 (18%)
Intermediate (3-4)	29 (42%)	30 (44%)
Good (5-6)	14 (21%)	26 (38%)
Total	68 (100%)	68 (100%)
Mean and SD	2.9±2.3	1.2±3.3

(p<0.0001)

partners. Only 7(10%) of the participants claimed that they visited a physician because of venereal diseases. The majority [63(91%)] of the participants asserted that they had never referred or Hx for HIV/AIDS lab testing. Other significant findings are demonstrated in Table 3.

Significant differences were observed between the means scores of the perceived susceptibility, perceived severity, perceived benefits, barriers and self-efficacy and pre and post educational intervention (p<0/001) (Table 4).

The multiple regression output revealed that all HBM constituents were significant predicting properties for preventive behaviors. Also, this finding indicated that self-efficacy was the strongest predictor of preventive behaviors (p< 0.001), followed by perceived susceptibility (p< 0.01) and perceived barriers (p< 0.01) (Table 5).

Discussion

In this research, we examined the applicability of the theory-based education intervention on preventive behaviors of

Table 3. Risky behaviors for HIV/AIDS

Behavior	Before	After
	N (%)	N (%)
Unused condom sex	64(94%)	28(41%)
Without any HIV/AIDS testing	63(91%)	8(12%)
Dangerous or non-marital sexual partners	26(38%)	9(13%)
Past Hx of drug injection	24(35%)	11(16%)
shared Needle	22(32%)	4(6%)
Tattooing with common/ suspicious appliance	20(29%)	5(7%)
Shared razor	14(19%)	4(6%)

Table 4. Descriptive statistics of the Theory-based models' constructs before and after the educational intervention

Constructs	Intervention				p*
	Before		After		
	Mean	SD	Mean	SD	
Perceived Susceptibility	4.43	0.32	7.15	0.41	0.0001
Perceived Severity	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 of Perceived Susceptibility, Severity, Benefits, Barriers & Self-Efficacy

Parameter	Standardized β	95% CI for β	p
Perceived Susceptibility	0.32	0.15-0.57	<0.001
Perceived Severity	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	<0.001
Self-Efficacy	0.36	0.20-0.86	<0.001

HIV/AIDS transmission in drug addicts in Saveh. Our findings revealed that an educational intervention based on a theory due to progression of participants' knowledge and positive effect on the perceived intensity, sensitivity, threat, perceived benefits and barriers and self-efficacy can lead to development, change or elimination of the behaviors that impact the prevention of HIV/AIDS; these results were in agreement with those of Reback (17), Rahmati (23) and Altschuler (28); the results were also approved by Bully (18) and Woodson (29). Our results signified that despite the fact that considerable portion of this study population had a good knowledge (42%), 37% had weak performance and it seems that to adopt preventive behaviors or actions, merely having knowledge is not enough, but the way of thinking as well as attitude toward a disease is a fundamental element in doing or undoing a preventive measure (30,31). In this regard, some researchers argued that regardless of the culture or race, individuals despite having a high level of knowledge about STDs/HIV, may tend to exhibit a propensity toward engaging in having unprotected sexual contact with multiple partners as risky sexual behaviors (32-34). In this study, 35% of the participants had a history of drug injection, 38% had the experience of risky sexual behaviors, but rarely used condom. Marshall (35) and Maher (36) revealed that lack or limitation of access to the single use injecting syringe may lead to reuse of the syringe and needle between peer groups, leading to spread of HIV/AIDS among the involved population.

Parallel to studies of Karimi (38), Beatrice Bean'E (39) and Ghafari (40), our research also revealed that health educational

intervention had an impact on improving the knowledge of HIV/AIDS participants as well as preventive behaviors. However, according to the researchers' opinion, advising about the transmission route and preventive measures of HIV, and the participants' acceptance aimed at changing the risky behaviors, may lead to decrease of HIV transmission (36,38).

Many of the participants in this study did not find themselves at risk of HIV/AIDS infection before the educational intervention, so the mean of perceived susceptibility before the intervention was 4.43. This dilemma may reduce their attention and sensitivity to adopt cautious behaviors and may expose many participants to HIV/AIDS infection risk. On the other hand, the findings signified that the participants had a low insight of their own vulnerability to HIV infection. Similarly a study by Lewis (41) and Parsons (42) showed that most college students who were engaged in sexual relationships have a tendency to perceive themselves as invulnerable to contracting sexually transmitted diseases (STDs) and do not feel the need for behavioral changes. In another study, Blashill and Safren found that perceived susceptibility was associated with increased safer sex intentions including abstinence intention (43). In the USA, Gielen et al. (2007) found that young women with a high level of perceived susceptibility were more likely to decide not to have sex with someone (44).

Our findings also indicated that perceived severity mean was 7.15 before the intervention. This means the participants had a good knowledge about this risk, because of the current educational programs and the type of training in our society. They know

that AIDS is a dangerous and incurable disease. A study by Adefuye et al. (2009) showed that perceived severity is a particularly important determinant in reducing sexual partners and in encouraging careful selection of sexual partners (45). Maher's research in Bangkok revealed that 95% of the addicted people believed the same and 100% knew the possibility of a suffering death (36). Rahmati's investigation revealed that most of the students are sensitive to AIDS as a serious disease (23). Study of Iriyama in Nepal also showed that students with high scores in perceived severity of HIV/AIDS had strong intentions to abstain from sexual activity (46). Also, Lollis et al. found a direct relation between the amount of perceived threat and using condom in American students (47). The study of Lin among the Taiwanese immigrants also showed a significant relation between the severity and perceived threat of AIDS and the reduction of risky behaviors (48).

The findings of our study revealed a significant difference between the means score of the perceived benefits and barriers, before and after the educational intervention. Moreover, 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 carrying out preventive behaviors (33,49,50). For example, in a study by Iriyama et al. it was found that perceived benefits and barriers were significant predictors of HIV testing (46). Crosby (33) and De Visser (34) also revealed a relation between the individual's attitudes toward the advantages of using condom and AIDS prevention. Volk (2001) investigated this subject in Kenya with an analytic attitude to the findings. The barriers of adopting preventive behaviors can be summarized as: lack of access to single use syringe and condom when needed, fear of being morbid and punished by the family in the case of HIV diagnosis (51). According to Hounton's study in Benin's rural areas, among the main barriers of using condom were the lack of access and tendency when

having risky behaviors (52). Eshrati et al. also showed that the prisoners' right perception to perceived barriers and benefits may affect the reduction of high-risk behaviors relating to HIV/AIDS (53). Karimy also showed that self-efficacy, safe sexual consultation and perceived barriers are the main variables of using condom and safe sexual behaviors (5). Considering the above mentioned findings, planning and implementing educational programs seem to be necessary to amend the beliefs of drug users.

In the present study, the findings of regression analysis suggested that self-efficacy was the strongest predictor of preventive behavior. Parallel to our study, Mutinta and Simuzoshya suggested that self-efficacy had the highest impact and association with the use of condom (54). Similarly, Lyon et al. established that the participants who had a low self-efficacy for sustaining a single-partner relationship had a tendency toward being involved in multiple-partner relationship (48); it justifies the relation between low self-efficacy and high risk behaviors. However, this study may help health educators who are 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 regards to the findings of our study, it can be concluded that HBM has a significant role in health behavior research; it highlights individuals' understanding of perceived susceptibility, self-efficacy, perceived severity, perceived benefits, perceived barriers and signals to action leading to preventive behaviors. Similar interventions based on other theories and models of behavior change are suggested for eradicating the barriers of the preventive behaviors.

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