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Effect of Educational Intervention Based on Health Belief Model on Prevention of Substance Abuse Among the Students of Khatam Al-Nabieen University in Afghanistan

Khanali Mohammadi [1] and Sedigheh Sadat Tavafian [1, *]

[1]Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

[*]*Corresponding author*: Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Jalale-Ale-Ahmad Ave., Tehran, Iran. Email: tavafian@modares.ac.ir

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Abstract

Background: Addiction in Afghanistan, as the largest opium producer in the world, is relatively high, and limited studies have indicated that the youth, especially students are the majority of the addicted cases in this country.
Objectives: This quasi-experimental study aimed at designing and evaluating the effect of educational intervention based on the Health Belief Model (HBM) on drug abuse prevention among the students of Khatam Al-Nabieen University in Afghanistan.
Methods: In this quasi-experimental study, 120 students of Khatam Al-Nabieen University residing in Ghazni city, Afghanistan, were randomly divided into two groups of the intervention and control (60 students per group). The HBM-based educational intervention was performed for the intervention group. The data in both groups were collected and evaluated at four time points, including before intervention, and immediately, 3, and 6 months after the intervention using a valid researcher-made questionnaire.
Results: Although there was no significant difference between the mean score of the HBM constructs ($P > 0.05$) before the intervention, the results of repeated measures ANOVA showed significant differences in the intervention group in HBM constructs and also intention toward substance abuse preventive behavior ($P < 0.001$). There were significant inter- and intra-group differences, as well as the group-time interaction in all HBM constructs mean scores ($P < 0.001$). Also, as the valuable finding, the preventive behavioral intention significantly ($P < 0.001$) improved following a 3- and 6-month follow-up in the intervention group (17.63 ± 1.34 and 17.66 ± 1.42, respectively) compared with the control group (10.95 ± 1.33 and 10.87 ± 1.22, respectively).
Conclusions: The results showed that the HBM-based educational program by preventing substance abuse can help students adopt proper behaviors.

Keywords: Addictive Behavior, Afghanistan, Health Belief Model, Substance Abuse, University Student

1. Background

Afghanistan, as the world's largest opium producer, has the highest prevalence of substance abuse, especially among the youth population. Furthermore, the age of onset of drug use shows a decreasing pattern. Due to the limited number of studies in Afghanistan, uncertain data is available regarding the prevalence of substance abuse in this country (1). Insufficient security, an uncertain future, poverty, and culture in Afghanistan, are the factors leading to psychological stress that subsequently causes the tendency for substance abuse among youths (1).

It has revealed that substance abuse can affect the social systems and act not only as a health problem but also as a social problem (2). Also, drug addiction, like other health problems, is associated with poverty in societies (3).

Students are one of the groups at higher risk of substance abuse because they are not aware of illicit drugs' outcomes and do not have correct beliefs about them (4). In this regard, using educational models to modify beliefs, as well as adopting optimal behaviors regarding substance abuse, have been significantly effective (4).

One of the most appropriate models to improve incorrect beliefs and adopt healthy behaviors is the health belief model (HBM) (5). HBM, which is primarily used for disease prevention, consists of constructs, such as perceived susceptibility (subjective assessment of being at high risk to be involved in a health problem), perceived severity (subjective assessment of the severity of a health problem and its potential consequences), perceived benefits (an individual's assessment of the value or efficacy of engaging in a health-promoting behavior to decrease the risk of disease), perceived barriers (an individual's assessment of the ob-

stacles to behavior change), and perceived self-efficacy (an individual's perception of his competence to successfully perform healthy behaviors) (5).

Because of the number of studies on the prevalence of addiction and its related factors among youths in Afghanistan, this study was done to assess the effect of the HBM-based educational intervention on the prevention of substance abuse among the students of the Khatam Al-Nabieen University, Afghanistan.

2. Objectives

In this study, the HBM-based educational intervention was used to promote substance abuse prevention behavior in students of the Khatam Al-Nabieen University, Afghanistan.

3. Methods

3.1. Design and Participants

In this quasi-experimental study, the students of Khatam Al-Nabieen private university in Ghazni, Afghanistan, were investigated in 2017 - 2018. The main branch of Khatam Al-Nabieen University is located in Kabul, as the capital city of Afghanistan, and its second branch is in Ghazni city that is one of the largest cities in this country. Inclusion criteria were studying in the university during the research, being able to participate in the educational program, and willingness to participate. Exclusion criteria were a history of substance abuse, no history of psychological disorders, being a temporary student, and being unable to participate in the educational program, and a lack of understanding of the standard Persian language.

3.2. Sample Size/Sampling

Because no validated relevant study was found in Afghanistan using the Pukak formula, the sample size was calculated as follows:

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 \left(\delta_1^2 + \delta_2^2\right)}{\left(\mu_1 - \mu_2\right)^2}$$

Where, α = 5%, β =80%, mean score of the control group (U_1) = 5.44, standard deviation of the control group (δ_1) = 1.39, mean score of the intervention group (U_2) = 6.30, and standard deviation of the intervention group (δ_2) = 1.86. Accordingly, the sample size was obtained, 58 individuals. However, considering a 5% probability of falling, 60 subjects in each group were estimated.

In the first stage, 408 out of 1,200 students studying in five faculties were randomly selected through simple sampling to provide the structural validity of the questionnaire. Then, 120 eligible students from the remained 792 students were selected randomly through simple sampling and received the numbers from 1 to 120. In the nest stage, to allocate the subjects to each group, block sampling was used so that the first number was allocated to the intervention group and the next one to the control group and so on. The CONSORT flowchart shows the sampling procedure (Figure 1).

3.3. Measurements

To collect data, a 63-item questionnaire was designed for qualitative research and literature review. In the used questionnaire, 17 items assessed knowledge, one item assessed cues to action of the preventive behaviors, and five items concerned preventive behavioral intention. There was no need to assess the items' construct validity because of their clarity.

Based on the explanatory factor analysis and construct validity of other questions, HBM constructs contained 38 items on perceived susceptibility (8 items), perceived severity (8 items), perceived benefits (9 items), perceived barriers (9 items), and perceived self-efficacy(4 items). However, two items did not obtain acceptable construct validity and were omitted.

These questions were scored on a 5-point Likert scale, and the higher scores showed better conditions. Content validity index (CVI) and content validity rate (CVR) of all constructs were acceptable. The consistency of the questionnaire was assessed through Cronbach's alpha, which was 0.82 for the whole scale. The test re-test reliability of the questionnaire was acceptable. The psychometric procedure of the HBM-based questionnaire will also be provided in another study.

3.4. Intervention

The content of the educational intervention was compiled according to the needs of the participants extracted from the interviews with the students and specialists, from the data obtained from the initial HBM-based questionnaire, and literature review. The designed educational program was conducted using a combined teaching method through lecture, group discussion, role-playing, and film screening in three 2-hour sessions. The first session addressed perceived severity and perceived susceptibility, the second session concerned perceived benefit and perceived barrier, and the last session considered perceived self-efficacy and cues to action. Each session included 6 - 12 students.

3.5. Statistical Analysis

Data were analyzed using the SPSS Software Version 16. Kolmogorov-Smirnov's test was used for assessing the normal distribution of data, which was confirmed. Chi-square

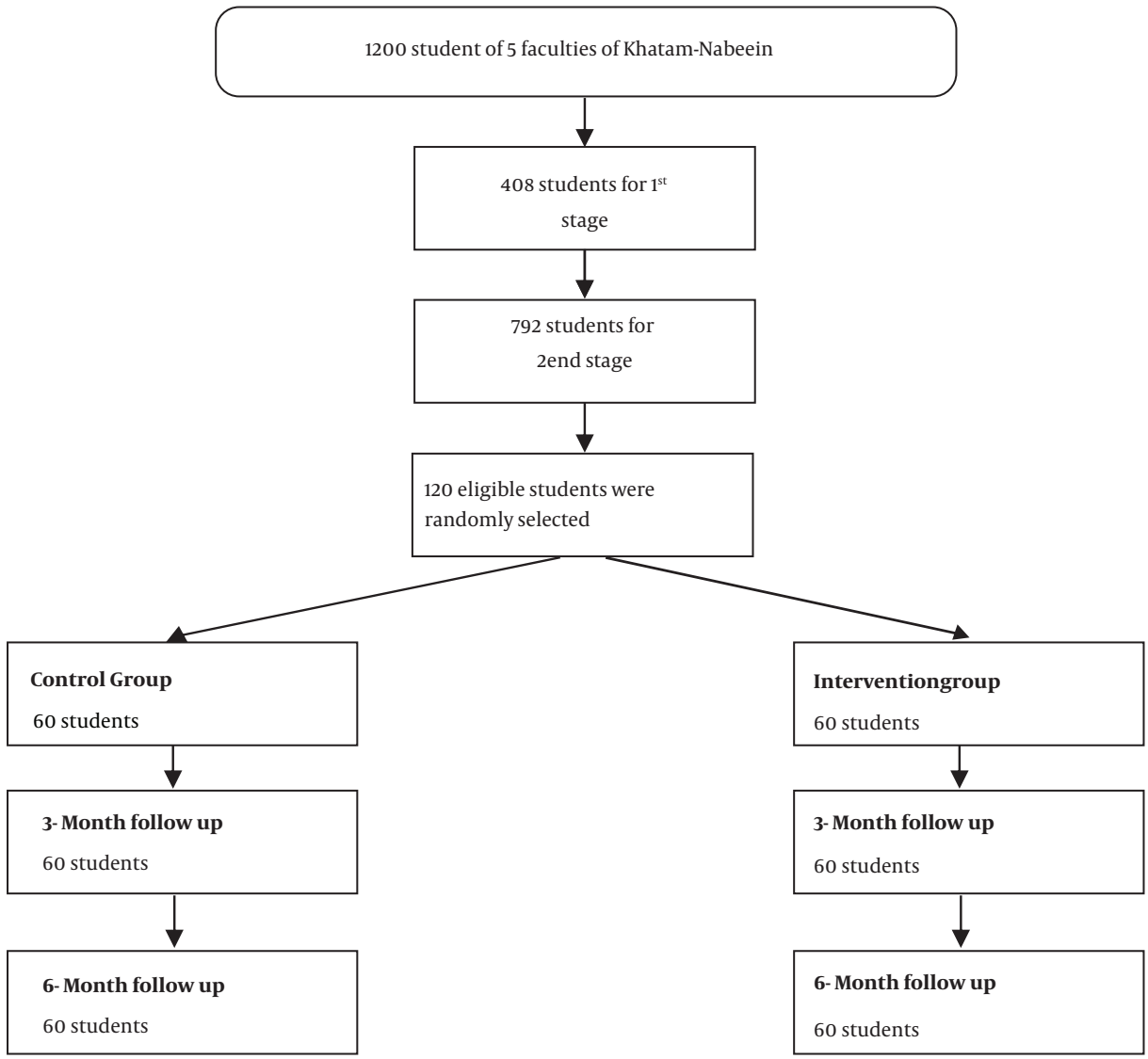

Figure 1. Flowchart of the sampling process

test and Independent *t*-test were used to compare non-parametric and parametric variables between two groups. Due to the normal distribution of data, repeated measures analysis of variance (ANOVA) was used to compare parametric variables between two groups at four time points.

As all subjects were permanent students of the university, they could receive the 3- and 6-month follow-up, and there were no missing participants. On the other hand, all the answers were checked after data collection, and unanswered questions were returned to the students to be completed. Therefore, there was no missing data in this study.

3.6. Ethics

Ethical approval was received from the Ethics Committee of Tarbiat Modares University (ID: IR.TMU.REC.1394.251; February 4, 2016). The research objective and procedure were explained to the participants. The participants were assured of anonymity and confidentiality of the data and then signed informed consent letters.

4. Results

Overall, 60 male and female students in each group participated in this study. According to the Independent

t-test and chi-square test results, there was no significant difference in age, gender, place of residence, and income ($P > 0.05$). The data in both groups were normalized using Kolmogorov-Smirnov's test ($P > 0.05$). Table 1 shows some demographic information on the subjects.

Based on the obtained mean (standard deviation) scores, the HBM constructs, including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, perceived self-efficacy, and intention to preventive behaviors did not differ significantly before the intervention (Table 2).

According to the results of repeated measures ANOVA, between-group and within-group differences and also time-group interaction of changes in HBM constructs in all four-time points (before the intervention and immediately, 3, and 6 months after the intervention were significant ($P < 0.001$) (Table 3).

5. Discussion

The obtained results showed that the HBM-based intervention was effective in improving intention towards preventive behavior regarding substance abuse among studied students.

According to the results, the designed HBM-based educational program could increase the knowledge and belief of the intervention group due to the substance abuse preventive behavior. This result is in line with the results of another study conducted in Iran (4), which revealed the educational program could promote students' knowledge and improve their beliefs regarding smoking behavior hazards (4). Several cognitive processes, such as attentional control are necessary for long-term substance abuse prevention. The current study using neurocognitive rehabilitation through enhancing the knowledge and improving the beliefs of the subjects regarding substance abuse can be implemented as a part of addiction prevention/treatment through highly flexible educational methods (6).

Although in the present study, the educational program could improve the participants' intentions to avoid substance-related risky behaviors, another study claimed that enhancing knowledge can not necessarily lead to improved preventive behaviors. However, this congruence might be attributed to the effect of other related factors rather than knowledge enhancement (4).

A significant increase in the perceived susceptibility in the intervention group of the present study confirmed the effect of the educational intervention on the undesirable consequences of substance abuse, which is in line with the results of other studies (7). According to HBM, when people obtain highly improved beliefs about the sensitivity and severity of a health problem, they may not pay attention to health recommendations unless the potential benefits and the barriers of that behavior are well-understood (8).

Furthermore, our findings revealed that perceived severity/susceptibility in the experimental group increased after the educational intervention, which is consistent with the results of some other relevant studies on the effect of the HBM-based educational program (9, 10). Moreover, a low level of perceived severity and sensitivity is one of the major barriers to preventive behaviors; therefore, perceived susceptibility and severity as two factors shaping behavior should be considered in interventions (11).

In the current study, perceived benefits, indicating one's subjective perception of the positive effects of substance abuse preventive behaviors, significantly improved in the intervention group than the control group. Mobile phone- and HBM-based educational interventions have shown to affect perceived benefits and perceived susceptibility (4, 12). Also, perceived susceptibility and perceived benefits are strong predictors for smoking cessation behaviors (11). In the present study, perceived barriers, indicating one's subjective perception of obstacles of doing preventive substance abuse behaviors, significantly increased following the educational program, which is consistent with other studies (8, 11).

Self-efficacy refers to an individual's belief in his capacity own capacity to perform healthy behaviors. It has been argued that people with lower self-efficacy have lower abilities to deal with problems and apply provided recommendations (5). Although in the present study, the students' perceived self-efficacy for doing substance abuse behaviors was acceptable in both groups, the educational program could improve self-efficacy in the intervention group that is consistent with another study, in which self-efficacy significantly improved following a self-efficacy-based educational program (13). In this regard, self-efficacy has reported as the strongest predictor of smoking among students (8).

The most important finding of the present study was behavioral intention improvement caused by the HBM-based educational program. This finding is consistent with another study, in which an HBM-based educational program could decrease high-risk behaviors among female substance abusers (14).

5.1. Conclusions and Suggestions

According to our results, the HBM-based educational program increased perceived susceptibility, perceived severity, perceived benefits, and perceived barriers and also promoted students' self-efficacy in substance abuse prevention leading to adopting correct intention towards preventive behaviors. Therefore, it is recommended to use

Table 1. Demographic Characteristics of the Studied Students at Baseline[a]

Variable	Control Group	Intervention Group	P Value
Age	22.30 ± 2.59	21.55 ± 2.90	0.45
Gender			0.78
Male	63 (76)	66 (80)	
Female	37 (44)	34 (40)	
Residency			0.74
Urban area	45 (55)	43 (52)	
Suburb	55 (65)	65 (67)	
Family income (Afghani)			0.82
< 10000	22 (24)	18 (22)	
10000 - 20000	33 (40)	35 (42)	
20000 - 30000	40 (48)	42 (50)	
> 30000	7 (8)	5 (6)	

[a]Values are expressed as mean ± SD or No. (%).

Table 2. Comparison of the Health Belief Model Constructs Between Two Groups at Baseline[a]

Variable	Group		Independent *t*-Test
	Intervention Group	Control Group	
Knowledge	37.46 ± 1.16	36.47 ± 1.13	0.968
Perceived susceptibility	32.7 ± 2.12	32.61 ± 2.07	0.680
Perceived severity	26.43 ± 1.31	27.44 ± 1.30	0.997
Perceived benefits	31.77 ± 2.51	30.76 ± 2.52	0.978
Perceived barriers	37.58 ± 1.08	37.40 ± 1.64	0.470
Self-efficacy	27.40 ± 1.32	26.42 ± 1.33	0.992
Preventive behavior intention	10.96 ± 1.31	11.95 ± 1.96	0.974

[a]Values are expressed as mean ± SD.

this model in youth to prevent substance abuse among this group.

5.2. Strong Points/Limitations

The present study had some strengths and limitations. This interventional research has been conducted for the first time in a country, where addiction is becoming so prevalent, especially between youths. Besides, based on the results, the HBM-based educational program could improve drug abuse prevention behaviors of the studied students.

However, regarding limitations, the self-report questionnaires were used, and also the students were limited to one university. Moreover, the effect of gender on substance abuse was not assessed in this study, even though male and female substance abusers have shown some differences (15). Despite the strengths of this research and also its similarity with other studies, these limitations can affect the accuracy and generalization of the findings. Therefore, further studies should be carried out in other universities and cities of Afghanistan.

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Table 3. Comparison of Health Belief Model Constructs in the Intervention and Control Groups Before, Immediately, 3, and 6 Months After the Intervention[a]

HBM structures, group	Before Intervention	Immediately After the Intervention	Three months After the Intervention	Six Months After the Intervention	P Value[b, c]
Knowledge					
Intervention	37.46 ± 1.16	45.04 ± 1.26	46.18 ± 1.26	45.98 ± 1.32	< 0.001
Control	36.47 ± 1.13	37.48 ± 0.96	37.35 ± 1.07	37.33 ± 1.1	0.779
P value[d]	0.698	< 0.001	< 0.001	< 0.001	< 0.001
Perceived susceptibility					
Intervention	32.77± 2.12	42.39± 1.90	42.11± 1.86	41.84± 1.95	< 0.001
Control	32.61± 2.07	33.04± 3.40	32.06± 2	32.08± 1.98	0.18
P value[d]	0.680	< 0.001	< 0.001	< 0.001	< 0.001
Perceived severity					
Intervention	26.44 ± 1.3	37.46 ± 1.18	36.97 ± 1.91	36.43 ± 1.26	< 0.001
Control	27.43 ± 1.3	26.33 ± 1.39	26.34 ± 1.22	26.19 ± 1.24	0.112
P value[d]	0.997	< 0.001	< 0.001	< 0.001	< 0.001
Perceived benefits					
Intervention	31.77 ± 2.51	42.52 ± 2.02	42.33 ± 1.96	42.32 ± 1.89	< 0.001
Control	30.76 ± 2.52	30.77 ± 2.53	30.53 ± 2.50	30.56 ± 2.52	0.942
P value[d]	0.978	< 0.001	< 0.001	< 0.001	< 0.001
Perceived barriers					
Intervention	45.18 ± 1.08	36.46 ± 1.65	37.73 ± 1.69	37.89 ± 1.57	< 0.001
Control	46.1 ± 1.64	45.18 ± 1.14	45.10 ± 1.01	45.3 ± 1.05	0.81
P value[d]	0.47	< 0.001	< 0.001	< 0.001	< 0.001
Self-efficacy					
Intervention	27.40 ± 1.32	37.44 ± 1.19	37.19 ± 1.13	36.19 ± 1.29	0.000
Control	26.44 ± 1.34	26.16 ± 1.42	26.19 ± 1.40	26.33 ± 1.36	0.58
P value[d]	0.992	< 0.001	< 0.001	< 0.001	< 0.001
Preventive behavior intention					
Intervention	10.96 ± 1.31	18.06 ± 1.21	17.63 ± 1.34	17.66 ± 1.42	< 0.001
Control	11.95 ± 1.31	10.91 ± 1.32	10.95 ± 1.33	10.87 ± 1.23	0.963
P value[d]	0.974	< 0.001	< 0.001	< 0.001	< 0.001

Abbreviation: HBM, Health Belief Model.
[a] Values are expressed as mean ± standard deviation.
[b] Derived from repeated measures or Friedman's test (within-group comparison).
[c] Significant level: $P < 0.05$.
[d] Derived from *t*-test or Mann-Whitney's test (between-group comparisons).

Footnotes

Authors' Contribution: Khanali Mohammadi participated in all stages of the study, Sedigheh Sadat Tavafian supervised the study. All authors participated in writing and approving the manuscript.

Conflict of Interests: The authors declared no conflict of interest in this study.

Ethical Approval: The ethical approval was received from the Ethics Committee of Tarbiat Modares University (Approval code: IR.TMU.REC.1394.251, Date: February 4, 2016).

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Patient Consent: The participants signed informed consent letters.

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