

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_831_22

The effect of web-based family-centered empowerment program in preventing the risk factors of substance abuse in students' parents; application of the health promotion model

Seyed M. Mehri, Masoumeh Hashemian, Hamid Joveini, Nader Sharifi¹,
Mohammad H. Rakhshani², Abdolghader Assarroudi³

Department of Health Education and Promotion, School of Health, Sabzevar University of Medical Sciences, Sabzevar, Iran, ¹Department of Public Health, Khomein University of Medical Sciences, Khomein, Iran, ²Department of Biostatistics and Epidemiology, School of Health, Sabzevar University of Medical Sciences, Sabzevar, Iran, ³Iranian Research Center on Healthy Aging, Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Sabzevar University of Medical Sciences, Sabzevar, Iran

Address for correspondence:

Dr. Hamid Joveini,
Department of Health Education, Faculty of Health, Sabzevar University of Medical Sciences, Sabzevar, Iran.
E-mail: hamidjoveyni124@gmail.com

Received: 15-06-2022
Accepted: 13-08-2022
Published: 31-05-2023

Abstract:

BACKGROUND: The age of onset of substance abuse among adolescents has recently decreased worldwide. Parents play an important role in preventing their children from drug abuse. This study aimed to investigate the effect of web-based family-centered empowerment program in preventing the risk factors of substance abuse in students' parents, using the health promotion model (HPM).

MATERIAL AND METHODS: This interventional study was based on 118 parents of high school students in Sabzevar, Iran (2019). Multi-stage random sampling was used to divide the participants into the experimental ($n = 65$) and control ($n = 65$) groups. The data were collected through a researcher-made questionnaire based on Pender's HPM. A website was designed to perform all stages of the study. The web-based educational intervention was performed for the experimental group. Both groups completed the questionnaires 2 months after the educational intervention. The data were analyzed using t-test, paired t-test, regression, correlation, and analysis of covariance.

RESULTS: There was a significant difference between the scores of prior related behavior, perceived benefits of action, activity-related effect, situational influences, competitors, and commitment in the parents of the experimental group compared to the control group after the educational intervention (P -value < 0.05). Moreover, a significant difference was observed between preventive behaviors of substance abuse and the mean score of perceived barriers to action, perceived self-efficacy, interpersonal influences, and role model in the parents of the experimental group compared to the control group after the educational intervention (P -value < 0.05).

CONCLUSION: Overall, designing an educational intervention based on the constructs of Pender's HPM could be an effective strategy for promoting preventive behaviors of substance abuse in parents.

Keywords:

Empowerment, health promotion model, parents, substance abuse, web-based

Introduction

Ensuring, maintaining, and promoting people's health is not possible without empowering them to control their individual and social destiny, and health

education is the starting point that ensures the empowerment of individuals and communities.^[1] Drug addiction has been recognized as one of the health, medical, and social problems of the present century,^[2]

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Mehri SM, Hashemian M, Joveini H, Sharifi N, Rakhshani MH, Assarroudi A. The effect of web-based family-centered empowerment program in preventing the risk factors of substance abuse in students' parents; application of the health promotion model. *J Edu Health Promot* 2023;12:175.

and it can be claimed that all societies are more or less involved with it.^[3] Drug abuse mostly begins among high school students; therefore, one of the most important ways to reduce drug abuse in adulthood is to control it in adolescence.^[4] Studies have shown that most adolescents start abusing drugs around the age of 12 or 13.^[5] The World Drug Report 2018 showed that drug abuse and its health effects are higher among young people than older people. Most research studies have shown that the early years of adolescence (12–14 years) to its final years (17–15 years) is a critical risk period for substance abuse and it may reach its maximum among adults (18–25 years).^[6] The prevalence of cannabis and amphetamine abuse in 13–15 years old students is, respectively, 3.5 and 3.3%, worldwide.^[7] According to the United Nations Office on Drugs and Crime (UNODC) in 2011, Iran has one of the highest rates of opioid use.^[8] Researchers believe that adolescents start using legal substances, such as cigarettes, and then turn to illegal substances, such as alcohol, inhalants, and marijuana.^[5,9] Research studies conducted in Iran have shown that 25% of students in the country are prone to addiction and 5% of them are addicted.^[10] Moreover, 4% of students under the age of 15 and 24.4% between the ages of 15 and 19 have started abusing drugs.^[11,12] Another study has reported a substance abuse rate of 5.7% among Iranian students.^[13] Over the past few years, the age of tendency to addiction has significantly decreased,^[14] and this has caused major concern among many families and policymakers; since, adolescents' tendency to addiction not only causes the loss of human resources, but also causes irreparable harm to the society. In this regard, it is very important to pay attention to the adolescents in the society and especially the students.^[10]

Students develop their behavior by socializing with their family and friends, and if family members are deviant, children will be affected. When an individual is more connected to the family, he/she is more dependent on the family, and as a result, family norms become more internalized. In preventing addiction, the family has a crucial role in satisfying needs as well as providing life and opportunities for future success for adolescents.^[15] The family, directly and indirectly, plays a very important role in the tendency of children and adolescents to abuse drugs.^[16] The goal of family-centered prevention programs is positive youth development by creating competent parents and family communication skills and behaviors that strengthen parent/child affection and dependency, effective supervision, and disciplinary skills, and effective communication.^[13]

The web-based intervention was considered as an innovation to conduct the study that does not require a specific time or place and the installation of special software. Experiences of such interventions have

shown that e-learning and web-based education can be well received by individuals, encouraging people to participate in health education programs.^[17] The results of the studies also have indicated the positive effects of the web-based family-centered educational-supportive program.^[18]

Theoretical framework

There is strong evidence that family-centered skills and educational programs have a positive impact on participants.^[19] Increasing knowledge leads to behavior change^[8,20]; therefore, interventions should be designed to maintain healthy behavior among the public.^[21] There are various theories and models for planning to change unhealthy behaviors and promote health.^[22] One of the comprehensive and predictive models used to study health-promoting behaviors, which provides a theoretical framework to find the factors affecting these behaviors, is Pender's health promotion model (HPM). In this model, the determinants of health-promoting behaviors include individual experiences and characteristics, activity related effects and cognitions of behavior, and behavioral outcomes.^[23] In this model, activity-related effects, such as perceived benefits of action and perceived barriers to action, directly affect the behavior.^[24] Most researchers used this model to study behaviors leading to health promotion.^[12,25] Therefore, due to the importance of using this model in promoting healthy behaviors, this study aimed to investigate the effect of web-based family-centered empowerment program in preventing the risk factors of substance abuse in students' parents, using the HPM.

Material and Methods

Study design and setting

This interventional study was conducted in 2018 in Sabzevar, Iran.

Study participants and sampling

The target group included the parents of second period high school students in Sabzevar selected by multi-stage random sampling ($n = 130$) and divided into the experimental ($n = 65$) and control ($n = 65$) groups. The inclusion criteria included satisfaction and interest in participating in the study, having a smartphone or computer, having at least a junior high school diploma, Internet access, and the ability to use it. For sampling, Sabzevar city was divided into six districts. Then, two high schools for boys and girls were multi-stage random sampling selected from each district and then a list of classes was prepared in each school. After that, the students were randomly selected and in the next stage, their parents were selected to participate in the study (according to the sample size and the inclusion criteria). The parents were given a voluntary informed

consent form if they were interested in participating in the study, and if they were not interested, another parent was asked to participate until the target sample size was completed in that school. The exclusion criteria included dissatisfaction with continuing the collaboration and failure to study at least three educational items (this possibility was provided through the site setting). The researchers tried to keep the sample loss rate as low as possible by taking appropriate measures (including initial face-to-face negotiation and justification and importance of the issue for parents, frequent phone and SMS follow-ups, sending thank you messages for doing and completing the research steps both via SMS and through messages on the website, answering phones and supporting Advice for conducting research and...). However, 17 parents (control group) and 4 parents (intervention group) were excluded from the study in the post-test phase.

Data collection tool and technique

The data collection tool was a researcher-made questionnaire based on Pender's HPM designed in

three sections and finally with 112 questions. The first section was related to demographic questions (12 questions), the second section was related to questions on substance abuse preventive behaviors (12 questions), and the third section was related to Pender's model constructs (88 questions). An example of the questions and its measurement scale is given in Table 1.

Then, 136 initial questions of the questionnaire were designed by reviewing various authentic scientific texts and studies. To confirm its face validity, it was then given to 10 parents and the ambiguous phrases and words reported by them in the questionnaire were removed or corrected. Then, the content validity was confirmed by a panel of experts (10 health education and addiction specialists) and thus, the content validity index (CVI) and content validity ratio (CVR) were measured. The CVR value for most questions was equal to one, indicating the high validity of the questionnaire and CVI was equal to 0.96, indicating the acceptable validity of the questionnaire. Cronbach's alpha was used to assess the reliability of the questionnaires. Alpha for

Table 1: The designed tool based on the HPM with the aim of preventing substance abuse

Construct	Question example	Coding to analyze data	Cronbach's alpha
Demographic information	Gender, number of children, educational status, occupation, etc.	Fits the question from 1 to ...	0.740
Preventive behaviors	How free is your adolescent to do his/her personal affairs?	The 5-point Likert scale (from (1) very high to (5) very low)	0.914
Prior behavior	Which of the following behaviors have you done in the last 3 months? Talking to your adolescent about his/her problems.	The 2-point Likert scale (from (1) I have done to (2) I have not done)	0.935
Perceived benefits of action	To what extent do you think the following items can be achieved by empowering the family to prevent substance abuse in children? Maintaining income and reducing family expenses.	The 5-point Likert scale (from (5) very high to (1) very low)	0.919
Perceived barriers to action	In case of any of the following items, to what extent can they reduce your motivation to prevent substance abuse in your adolescent? Lack of time and overwork.	The 5-point Likert scale (from (5) very high to (1) very low)	0.755
Perceived self-efficacy	I think I can prevent substance abuse in my adolescent, even: If I am away from my family.	The 5-point Likert scale from (5) absolutely sure to (1) not at all sure	0.814
Activity related effect	To what extent do your actions to prevent substance abuse in your adolescent make you feel the followings: Feeling useful	The 5-point Likert scale (from (5) to a great extent to (1) not at all)	0.733
Interpersonal influences	To what extent do the following people expect and encourage you to prevent substance abuse in your adolescent? My friends	The 5-point Likert scale (from (5) to a great extent to (1) not at all)	0.966
Situational influences	To what extent do the following facilities and situations enable you to prevent substance abuse in your adolescent more seriously? Setting rules in the family	The 5-point Likert scale (from (5) to a great extent to (1) not at all)	0.845
Competitors' demands and priorities	To what extent do you prefer planning to prevent substance abuse in your adolescent to the following issues? Socializing and having fun with friends and colleagues	The 5-point Likert scale (from (5) to a great extent to (1) not at all)	0.892
Model	To what extent do the following people are role models for you in preventing substance abuse? My colleagues	The 5-point Likert scale (from (5) to a great extent to (1) not at all)	0.740
Commitment to plan of action	Choose the best response about yourself in the following sentences. Preventing substance abuse in my adolescent is so important to me that I dedicate specific time to it.	The 5-point Likert scale (from (5) strongly agree to (1) strongly disagree)	0.914

questionnaire constructs was obtained between 0.740 and 0.966, indicating high internal consistency and desirability of the scale. Moreover, the construct validity was performed on 336 parents and was analyzed and confirmed by Lisrel software. The results showed a good model fit and good reliability of the questionnaire, which has been published in an article.^[26]

Out of 136 questions, 24 questions were removed and the questionnaire was approved with 112 questions. Both groups completed the questionnaire at the beginning and 2 months after the educational intervention.

Designing website

To conduct the study, a website was needed to complete the questionnaire and educational intervention. Given that, according to the searching, no website was found to meet the requirements of this study, a website and a research system were designed and programmed to conduct the web-based study (www.mehritest.ir). Usernames and passwords were created for the participants, and all stages of the study (completing the consent form to participate in the study, conducting the pre-test, dividing the subjects into control and intervention groups, observing and studying educational media in the intervention group, conducting the post-test) were done using this website. Supporting and notifying were provided by SMS and telephone calls. There was also a guide to use the website and a contact us page on the website.

Educational intervention program

Considering the most important predictors of substance abuse preventive behaviors, obtained from analyzing the pre-test data and emphasizing them, 15 educational media (including one poster, 1 animation, 4 short films, and 9 illustrated educational texts in PDF format) were produced and uploaded in the website tutorial and provided to parents for 20 days with the possibility of saving. In designing the media with the help of relevant experts in the field of designing health messages, it was tried to observe the principles of designing media and have the necessary attractiveness to encourage the parents to study and be approved by professors.

The media topics include substance abuse statistics among students, familiarity with effective and practical solutions to prevent substance abuse, preventive advice to parents, family and addiction prevention, the introduction of various drugs, addiction prevention in adolescents, self-efficacy, life skills, the way parents talk to their children, the role of parents in preventing substance abuse among their children, as well as parents and addiction prevention.

In the designed website, only the intervention group members with their username and password could enter

the education section and use its content. After studying or viewing any content, the parents confirmed their visits by checking confirmation. In the website management panel, the statistics of the users' visits, studying, and not studying tutorials were specified as a follow-up.

The experimental group did not receive any intervention from the researcher and received the routine community education and the "student, parents, and colleagues simultaneous empowerment plan" held in the education system regarding addiction prevention.

Ethical consideration

This study was approved by the ethics committee of Sabzevar University of Medical Sciences with the code (IR.MEDSAB.REC.1397.096). In addition, a written consent form was obtained from all the parents before explaining the purpose of the study.

The collected data were analyzed using Statistical Package for Social Sciences 16 statistical software and the P -value < 0.05 was considered statistically significant. Chi-square (or Fisher's exact test) and t (or Mann-Whitney) tests were used to compare demographic characteristics between the groups. Mean (standard deviation) or median (interquartile range) was used to describe the quantitative variables according to the conditions, and frequency (percentage) report was used for the qualitative variables. To compare the mean quantitative impacts between the two groups, t -test or its non-parametric equivalent, Mann-Whitney test, was used. Chi-square test or Fisher's exact test was used to compare the qualitative factors between the groups. The analysis of covariance via regression model was used to study the constructs during the design phase.

Results

In this study, 53.2% of the parents were fathers and 46.8% were mothers, 53.2% of whom had a son and 46.8% had a daughter. Both experimental and control groups were compared in terms of demographic variables at the beginning of the study in terms of similarity and significant differences [Table 2].

Prior to the intervention, the participants' status regarding preventive behavior of substance abuse was not favorable (P -value = 0.385); however, it significantly increased after the intervention in the experimental group compared to the control group (P -value < 0.001). In evaluating regression analysis indices of HPM components before the intervention [Table 3], interpersonal influences ($\beta = 0.41$), perceived benefits of action ($\beta = 0.40$), and perceived self-efficacy ($\beta = 0.37$), and prior related behavior ($\beta = 0.37$) were the strongest predictors of the behavior. Perceived benefits of action

Table 2: Frequency of the parents' demographic characteristics in the experimental and control groups before the intervention

Variable	Subgroup	Control group		Experimental group		Total		Other results
		n	%	n	%	n	%	
Age	33-40 years	21	34.4	15	31.2	36	33.0	$P=0.412$, $df=2$, $\chi^2=1.77$
	41-46 years	23	37.7	14	29.2	37	33.9	
	47-55 years	17	27.9	19	39.6	36	33.0	
Number of children	1-2 children	42	68.9	24	50.0	66	60.6	$P=0.051$, $df=1$, $\chi^2=3.99$
	3-7 children	19	31.1	24	50.0	43	39.4	
Gender	Male	32	66.7	26	42.6	58	53.2	$P=0.010$, $df=1$, $\chi^2=6.24$
	Female	16	33.3	35	57.4	51	46.8	
Children's gender	Boy	23	47.9	35	57.4	58	53.2	$P=0.33$, $df=1$, $\chi^2=0.96$
	Girl	25	52.1	26	42.6	51	46.8	
Marital status	Married	47	97.9	59	96.7	106	97.2	$P=1$, $df=2$, Fisher's exact=1.01
	Divorced	0	0	1	1.6	1	0.9	
	Spouse has died	1	2.1	1	1.6	2	1.8	
Educational status	High school degree	13	27.1	17	27.9	30	27.5	$P=0.52$, $df=2$, $\chi^2=1.31$
	Diploma and associate degree	25	52.1	26	42.6	51	46.8	
	Bachelor and higher	10	20.8	18	29.5	28	25.7	
Spouse's educational level	I do not have a spouse	1	2.1	2	3.3	3	2.8	$P=0.14$, $df=3$, Fisher's exact=5.14
	High school degree	8	16.7	9	14.8	17	15.6	
	Diploma and associate degree	24	50.0	19	31.1	43	39.4	
	Bachelor and higher	15	31.2	31	50.8	46	42.2	
Occupation	Employee	19	39.6	33	54.1	52	47.7	$P=0.000$, $df=2$, $\chi^2=15.23$
	Self-employed	22	45.8	8	13.1	30	27.5	
	Housewife/househusband	30	14.6	20	32.8	27	24.8	
Spouse's occupation	I do not have a spouse	1	2.1	2	3.3	3	2.8	$P=0.01$, $df=3$, Fisher's exact=10.21
	Employee	15	31.2	26	42.6	41	37.6	
	Self-employed	8	16.7	20	32.8	28	25.7	
	Housewife/househusband	24	50.0	13	21.3	37	33.9	
Family financial status	Poor	0	0	1	1.6	1	0.9	$P=0.003$, $df=2$, Fisher's exact=10.06
	Fair	39	81.2	32	52.5	71	65.1	
	Good	9	18.8	28	45.9	37	33.9	
Children's living status	Living with parents	47	97.9	58	95.1	105	96.3	$P=1$, $df=2$, Fisher's exact=0.98
	Living with father	0	0	1	1.6	1	0.9	
	Living with mother	1	2.1	2	3.3	3	2.8	
	Living with people other than parents and spouse	0	0	0	0	0	0	
Type of school	Boys high school	22	45.8	33	54.1	55	50.5	$P=0.39$, $df=1$, $\chi^2=0.73$
	Girls high school	26	54.2	28	45.9	54	49.5	

Table 3: Regression analysis indices of HPM components before the intervention

Construct	Coefficient (B)	Standard error	Standardized coefficient (β)	P	Adjusted R ²
Prior related behavior	0.82	0.22	0.37	0.000	0.24
Perceived benefits of action	0.46	0.10	0.40	0.000	0.29
Perceived barriers to action	0.01 -	0.04	0.02-	0.806	0.13
Perceived self-efficacy	0.23	0.05	0.37	0.000	0.27
Activity related effect	0.16	0.14	0.12	0.226	0.14
Interpersonal influences	0.37	0.08	0.41	0.000	0.28
Situational influences	0.44	0.12	0.32	0.001	0.23
Competitors' demands	0.004-	0.05	0.008 -	0.934	0.12
Model	0.33	0.11	0.28	0.004	0.20
Commitment to plan of action	0.57	0.16	0.32	0.001	0.23

and self-efficacy could predict 29 and 27% of the variance in substance abuse prevention behavior, respectively. The results showed that there was no statistically

significant difference between the experimental and control groups regarding any of the demographic variables.

Table 4 shows that in 9 variables of 10 constructs related to the HPM, no statistically significant difference was observed between the experimental and control groups before the intervention program. The results also show that there is a significant difference between the scores of prior related behavior, perceived benefits of action, interpersonal influences, Situational influences, competitors, and commitment in the parents of the

Table 4: Comparison of mean difference and standard deviation of HPM constructs scores, before and 2 months after the educational intervention

	Before the Intervention	2 months after the intervention	P
Behavior			
Intervention	3.91±44.02	2.99±45.84	0.010
Control	5.00±43.27	3.87±42.56	0.437
P	0.385	0.000	
Prior related behavior			
Intervention	1.89±9.13	1.47±10.36	0.000
Control	2.15±9.04	1.27±9.44	0.18
P	0.76	0.002	
Perceived benefits of action			
Intervention	3.74±48.08	2.36±50.46	0.000
Control	4.08±48.19	4.01±49.08	0.375
P	0.889	0.057	
Perceived barriers to action			
Intervention	12.10±28.41	4.70±25.38	0.338
Control	8.74±27.88	3.75±26.21	0.591
P	0.511	0.494	
Perceived self-efficacy			
Intervention	8.50±36.11	2.69±37.30	0.308
Control	5.51±35.17	4.17±36.19	0.084
P	0.543	0.022	
Individual influencers			
Intervention	3.22±25.11	1.60±28.21	0.000
Control	3.20±25.58	1.98±26.48	0.229
P	0.36	0.000	
Interpersonal influences			
Intervention	5.23±33.57	2.72±34.43	0.425
Control	4.18±32.33	3.73±33.02	0.212
P	0.124	0.032	
Situational influences			
Intervention	3.38±33.85	2.44±35.52	0.002
Control	3.08±33.71	2.43±34.19	0.0194
P	0.589	0.005	
Competitors			
Intervention	7.85±24.18	5.38±27.34	0.001
Control	9.90±25.73	5.91±25.85	0.932
P	0.304	0.499	
Model			
Intervention	4.16±25.72	2.28±26.26	0.656
Control	3.07±24.17	3.10±23.42	0.224
P	0.004	0.000	
Commitment			
Intervention	2.77±27.07	1.61±28.26	0.007
Control	2.16±26.54	3.23±26.15	0.778
P	0.147	0.000	

experimental group compared to the control group after the educational intervention.

Evaluating the analysis of covariance (ANCOVA) via regression model indices of the effect of education on behavior and the HPM constructs [Table 5] indicated that education could increase the behavior score by 3.27. After behavior, the constructs of the model, commitment to plan of action, and activity-related effect had the highest score increase of 2.66, 2.02, and 1.40, respectively, after the educational intervention. Moreover, education had the most effect on constructs of model ($\beta = 0.44$), activity-related effect ($\beta = 0.44$), parents' behavior ($\beta = 0.43$), and prior related behavior ($\beta = 0.32$).

Discussion

The results of this study showed that the structures parents' prior behavior and behavior were not favorable before the intervention. However, it was expected to be in a better position, given the importance of the issue. The results of this study are consistent with the studies of Yazdanpanah,^[27] Mazloomi Mahmoodabad,^[28] and Hossein Rezaei.^[29] The results showed that education could have the greatest effect on the behavior score, as well as the effect of the intervention on the experimental group, parents who had a girl, and in families where the child lives with parents. Improving the behavior after the intervention in the experimental group is in line with studies conducted by Khodaveisi,^[30] Taheri,^[31] Dehdari,^[32] and Khodaveisi.^[30]

The results of this study and the conducted studies^[33] discuss the design and implementation of interventions to prevent substance abuse in comparison with the competitor's preferences and demands, such as watching TV and using computer. The results indicated that after the intervention, the parents became more responsible for preventing substance abuse in their adolescents, and preferred this issue to watching TV, cyberspace, using the Internet, and relaxing.

In this study, it was shown that to increase the preventive behavior of substance abuse by parents, perceived barriers to action should be reduced. Moreover, it can be concluded that adequate income and consequently, sufficient time for parents to take care of their children are necessary to improve the parents' preventive behaviors, which is in line with the results of studies by Rahimi^[32] and Kamali.^[34] In this study, the child's residence in the dormitory, lack of knowledge about drugs, lack of time and overwork, when parents are away from the family, and lack of authorities' attention to the adolescents' problems were the most important perceived barriers to action from the participants' viewpoint. This result is in line with that of Kumpfer's study, which reported

Table 5: ANCOVA indices of the effect of education on behavior and the HPM constructs

Constructs	Coefficient (B)	Standard error	Standardized coefficient (β)	P
Behavior	3.27	0.66	0.43	0.000
Prior related behavior	0.92	0.27	0.32	0.001
Perceived benefits of action	1.37	0.62	0.21	0.028
Perceived barriers to action	1.48	0.82	0.17	0.074
Perceived self-efficacy	0.50	0.73	0.07	0.493
Activity related effect	1.74	0.34	0.44	0.000
Interpersonal influences	1.40	0.62	0.21	0.025
Situational influences	1.38	0.46	0.27	0.003
Competitors' demands	1.51	1.03	0.13	0.147
Role model	2.66	0.52	0.44	0.000
Commitment to plan of action	2.02	0.42	0.38	0.000

lack of time and overwork as the main perceived barriers to action.

Self-efficacy is a predictor of performance and people with a stronger sense of self-efficacy show greater effort, more seriousness, and longer endurance in acquiring new tasks compared to those with less self-efficacy.^[13,35,36] Therefore, by providing appropriate educational resources, experienced and caring counselors, as well as educational facilities in the place of residence, some barriers to prevent substance abuse can be removed. Hence, in designing educations and interventions, great attention should be paid to the individuals' benefits from behavior change, self-efficacy and incentives. Brownson,^[37] Saelens,^[38] and Nikpour^[39] also reported the positive effect of the environment and access to facilities on parents' preventive behavior.

The results of the present study showed that there was a significant difference in the construct of perceived benefits of action in the experimental group after the intervention and the participants' knowledge about the benefits of substance abuse prevention increased, which is consistent with Mazloomi Mahmoodabad's study^[28] and the results of our research were contrary to Shokoohi's study^[40] These changes can indicate the effectiveness of educational intervention to promote and identify the benefits and effects of parent's behavior changes in preventing substance abuse in their children.

Solhi and Banaye Jedd also stated an increase in the score of commitment construct after the intervention.^[41,42] In Mirkarimi's study,^[43] the commitment construct was not one of the main influential constructs. Given that having a positive feeling about behavior increases the probability of doing and repeating, it is necessary to consider creating a positive feeling about regular preventive behaviors to increase the substance abuse preventive behavior in parents. The results showed that after the educational intervention, most parents would use every opportunity to plan to prevent substance abuse.

The results of similar studies have shown that family interventions are the most effective prevention and treatment measures for drug abuse and other negative growth consequences in adolescents.^[35,44] Therefore, planning to empower the family to promote the status of substance abuse preventive behavior should be considered.^[45] The mentioned results indicate the effect of web-based family-centered empowerment program intervention on improving most HPM constructs. Given that these constructs are effective in improving the status of preventive behavior, their implementation and promotion can be effective in improving preventive behavior.

Limitation and recommendation

One of the limitations of the present study was that the studied subjects were only from a small geographical area in Iran, Sabzevar. Therefore, the participants were not good representatives of parents in Iran and other countries. It is suggested that a future study be conducted to determine whether or not educational programs reduce parent's level of empowerment and prevention of substance abuse risk factors among students in other parts of Iran and the world.

Suggestions

It is recommended to provide basic facilities and job opportunities by related organizations with sufficient income, develop sports facilities, establish regulations in the family, provide facilities for the child's education in residence, and pay attention to preventive behaviors as one of the important components of lifestyle change.

Conclusion

The results indicate the effectiveness of the educational program based on the constructs of Pender's HPM in empowering parents to prevent substance abuse risk factors among students. Educational programs are effective strategies that help empower parents to deal more easily with the problems and barriers to preventing substance abuse. In addition to education,

more measures are required to prevent substance abuse.

Acknowledgments

This study was approved by the ethics committee of Sabzevar University of Medical Sciences (code: IR.MEDSAB.REC.1399.007). All participants signed the consent form before beginning the study.

Financial support and sponsorship

This study was supported by Sabzevar University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest.

References

- Zare Harofteh F, Bahrevar V, Madani SM. Are the musculoskeletal pains the most important health problem for employees of mellat bank? A cross sectional study in Yazd, Iran. *Int J Musculoskeletal Pain Prev* 2017;2:333-7.
- Martínez Loredó V, Fernández Hermida JR. Impulsivity-targeted selective preventive interventions and treatments in addictive behaviors. *Rev de Psicología Clínica con niños y adolescentes* 2019;6:1-7.
- Javanbakht M, Tofani H. Comparison of coping and dysfunctional attitudes in substance abuser and control group. *Journal of Asrar* 2002; 9(1).
- Rahimi Movaghar A, Shimi A. Substances use situation in Iranian students. *Social Welfare Quarterly* 2006;19:9-29.
- Neinstein L. *Understanding Legal Aspects of Care. Adolescent Health Care: A Practical Guide*. Baltimore: Williams & Wilkins; 1996. P. 150-5.
- Azadmarzabadi E, Tarkhorani H, Emami Khansari N. Job stress in a group of military personnel. *J Military Med* 2007;9:15-22.
- Azad-Marzabadi E, Salimi SH. Study on job stress in a military unit. *J Mil Med* 2005;6:279-84.
- Hazavehei SMM, Pirzadeh A, Entezari MH, Hasanzadeh A. The effect of educational program based on BASNEF model on the nutritional behavior of students. *Zahedan J Res Med Sci* 2011;13:e94085.
- Rezaei H, Amidi Mazaheri M, Rahimi M, Fathian Dastgerdi Z, Eslami AA. Assessment of the questionnaire of environmental factors and adolescent smoking behavior: A psychometric study *Journal of Substance Use* 2021;26:369-75.
- Pourmanafi A, Ghorbani E. Modern prevention: The role of virtual media in addiction prevention in cyber space. *Res Addict* 2019;12:9-22.
- Pujol H, Stoebner A, Cabrol C. Prevention of nicotine addiction in the school environment. *Bull Acad Natl Med* 1994;178:955-9; discussion 9-60.
- Kumpfer KL. Family-based interventions for the prevention of substance abuse and other impulse control disorders in girls. *ISRN Addict* 2014;2014. doi: 10.1155/2014/308789.
- Webster-Stratton C, Taylor T. Nipping early risk factors in the bud: Preventing substance abuse, delinquency, and violence in adolescence through interventions targeted at young children (0-8 years). *Prev Sci* 2001;2:165-92.
- Kaplan HI, Sadock BJ. *Study Guide and Self-Examination Review for Synopsis of Psychiatry and Comprehensive Textbook of Psychiatry*. (7th ed.). Philadelphia: lippincott Williams & wilkins; 2000.
- Jahedi N, Talepaskan S, Rahimian-Bougar E. Validation of partners' checklist: Measurement of the problems experienced by family members of drug abusers. *Res Addict* 2016;10:211-32.
- Solati S, Abedin Zadeh Mr, Nikfarjam M, Deris F. Relationship between substance abuse and mental disorders of family (2001). *J Shahrekord Univ Med Sci* 2004;6:1-8.
- Fonseca A, Alves S, Monteiro F, Gorayeb R, Canavarro MC. Be a Mom, a web-based intervention to prevent postpartum depression: Results from a pilot randomized controlled trial. *Behav Ther* 2020;51:616-33.
- Moeini M, Shafiei D. The impact of a web-based family-oriented supportive education program in adherence to treatment of the heart failure patients after discharge from hospital; a randomized clinical trial. *J Clin Nurs Midwifery* 2019;7:286-95.
- Scheier LM, Hansen WB. *Parenting and Teen Drug Use: The Most Recent Findings from Research, Prevention, and Treatment*. Oxford University Press, Oxford OX2 6DP, United Kingdom; 2014.
- Jouhari Z, Pirasteh A, Davati A, Mohammadi Z. The effect of educational intervention in volunteer's earthquake knowledge in health centers of eastern Tehran. *Daneshvar Medicine* 2013;(103).
- Hosseini H, Tari Marzabad A, Hassanpour-ezatti M. Introducing an integro-differential equation model for spread of addictive drugs abuse. *Res Addict* 2017;10:255-66.
- Hazavehei S, Shadzi S, Asgari T, Pourabdian S, Hasanzadeh A. The effect of safety education based on Health Belief Model (HBM) on the workers practice of Borujen industrial town in using the personal protection respiratory equipments. *Iran Occup Health J* 2008;5:21-30.
- Rahnavard Z, Zolfaghari M, Kazemnejad A, Hatamipour K. An investigation of quality of life and factors affecting it in the patients with congestive heart failure. *J Hayat* 2006;12:77-86.
- Mazloomi SS, Saba MA, Morovati MA, Fallahzadeh H. The relation of knowledge, attitude and self-management behaviors in asthmatic patients with controlling asthma. *Zahedan J Res Med Sci* 2012;14.
- Heydari A, Khorashadizadeh F. Pender's health promotion model in medical research. *Studies* 2014;41:59.
- Mehri SM, Rohban A, Hashemian M, Joveini H, Mehri A, Rakhshani MH, et al. Development and validation of an instrument to measure parental factors related to substance use prevention in adolescents. *Curr Drug Res Rev* 2020;12:158-67.
- Yazdanpanah B, Safari M, Yosefi M, Angha P, Habibian M, Zandi K, et al. Effects of community based educational prevention program of drug abuse in reduction of high risk behavior. *J Shahid Sadoughi Univ Med Sci* 2010;18:191-8.
- Mazloomi Mahmoodabad SS, Khoshab S, Sohrabi Vafa F, Fallahzadeh H, Yassini Ardekani SM. The effect of health education based on health belief model on preventive actions of synthetic drugs dependence in male students of Kerman, Iran. *Soc Behav Res Health* 2017;1:100-7.
- Hosseini-Rezaei H, Mohammad-Alizadeh S. Parents' knowledge about the symptoms of substance abuse: A study on parents of students in Kerman high schools and secondary schools. *JKMU* 2008;15:261-8.
- Khodaveisi M, Omid A, Farokhi S, Soltanian AR. The effect of Pender's health promotion model in improving the nutritional behavior of overweight and obese women. *Int J Community Based Nurs Midwifery* 2017;5:165-74.
- Sadeghmoghadam L, Tavakolizadeh J, Mazloun Shahri SB, Taheri M. Effectiveness of Pender's health promotion model on reducing drivers high-risk behaviors. *J Police Med* 2018;7:97-102.
- Dehdari T, Rahimi T, Aryaeian N, Gohari MR. Effect of nutrition education intervention based on Pender's Health Promotion Model in improving the frequency and nutrient intake of breakfast consumption among female Iranian students. *Public Health Nutr* 2014;17:657-66.

33. Teymouri P, Niknami S, Ghofranipour F. Effects of a school-based intervention on the basis of Pender's health promotion model to improve physical activity among high school girls. *Armaghanj* 2007;12:47-59.
34. Khosravan S, Alami A, Mansoorian MR, Kamali M. The effect of intervention based on Pender's model of health-promoting self-care behaviors in women who are the head of their household. *Nurs Midwifery Stud* 2016;5. doi: 10.17795/nmsjournal37253.
35. Kumpfer KL, Alvarado R. Family-strengthening approaches for the prevention of youth problem behaviors. *Am Psychol* 2003;58:457-65.
36. Hakkak HM, Joveini H, Rajabzadeh R, Robatsarpooshi D, Tori NA, Haresabadi M, *et al.* Health literacy level and related factors among pregnant women referring to bojnord health centers in 2017. *Int J Pharm Res* 2019;11:152-8.
37. Brownson RC, Baker EA, Housemann RA, Brennan LK, Bacak SJ. Environmental and policy determinants of physical activity in the United States. *Am J Public Health* 2001;91:1995-2003.
38. Saelens BE, Sallis JF, Black JB, Chen D. Neighborhood-based differences in physical activity: An environment scale evaluation. *Am J Public Health* 2003;93:1552-8.
39. Nikpour G. Drugs and drug policy in the Islamic Republic of Iran. *Middle East Briefs* 2019;119:2-7.
40. Shokoohi M, Jamshidimanesh M, Ranjbar H, Saffari M, Motamed A. The effectiveness of a model-based health education program on protective behavior against human papillomavirus in female drug abusers: A randomized controlled trial. *HIV AIDS Rev Int J HIV Relat Probl* 2020;19:16-23.
41. Solhi M, Ahmadi L, Taghdisi MH, Haghani H. The effect of trans theoretical model (TTM) on exercise behavior in pregnant women referred to dehaghan rural health center in. *Iran J Med Educ* 2012;11:942-50.
42. Banaye Jedd M, Babazadeh T, Hashemian Z, Moradi F, Ghavami Z. Cognitive-behavioral determinants of oral health in students: An application of Pender's health promotion model. *J Educ Community Health* 2016;3:1-8.
43. Kamal Mirkarimi S, Maghsoudloo M, Berdi Ozouni-Davaji R, Raeisi V, Charkazi A, Raeisi M. The determinants of hypertension and commitment to implementing a nutrition program: Application of Pender health promotion model. *J Health Lit* 2018;3:50-60.
44. Kumpfer KL, Magalhães C, Xie J. Cultural adaptations of evidence-based family interventions to strengthen families and improve children's developmental outcomes. *Eur J Dev Psychol* 2012;9:104-16.
45. Vahedian-Shahroodi M, Amin-Shokravi F, Hidarnia A, Jabbari Nooghabid H. A Survey on the effects of the Pender's Health Promotion Model on prediction of the employees' physical activity. *Health Educ Health Promot* 2013;1:51-66.