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

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Research

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Abstract

Background and aim: 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).

Method: 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 variance.

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.

1. 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), 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 to 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). According to statistics provided by the Ministry of Education, there are at least 500,000 students at risk of addiction. Research studies conducted in Iran have shown that 25% of students in the country are prone to addiction and 5% of whom are addicted (9). Moreover, 4% of students under the age of 15 and 24.4% between the ages of 15 to 19 have started abusing drugs (10, 11). Another study has reported a substance abuse rate of 5.7% among Iranian students (12). Over the past few years, the age of tendency to addiction has significantly decreased (13) and this has caused a 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 of the society and especially the students (9).

Students develop their behavior in 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 (14). The family, directly and indirectly, plays a very important role in the tendency of children and adolescents to abuse drugs (15). 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 (12).

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 (16). The results of the studies also have indicated the positive effects of the web-based family-centered educational-supportive program (17).

1.1. Theoretical framework

There is strong evidence that family-centered skills and educational programs have a positive impact on participants (18). Increasing knowledge leads to behavior change (8, 19); therefore, interventions should be designed to maintain healthy behavior among the public (20). There are various theories and models for planning to change unhealthy behaviors and promote health (21). 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 effect and cognitions of behavior, and behavioral outcomes (22). In this model, activity-related effects, such as perceived benefits of action and perceived barriers to action, directly affect the behavior (23). Most researchers used this model to study behaviors leading to health promotion (11, 24).

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.

2. Materials And Method

2.1. The participants and area

This interventional study was conducted in 2018 in Sabzevar, Iran. 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 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 randomly 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. However, 17 parents (control group) and 4 parents (intervention group) were excluded from the study in the post-test phase.

2.2. Measurement and tools

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 of 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.

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, and 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 three 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 affect	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

Construct	Question example	Coding to analyze data	Cronbach's alpha
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

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 questionnaire constructs was obtained between 0.740–0.966, 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 have been published in an article.

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.

2.3. Designing website

In order 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 subjects, 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 was

provided by SMS and telephone calls. There was also a guide to use the website and a contact us page on the website.

2.4. Educational intervention

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, colleagues simultaneous empowerment plan" held in the education system regarding addiction prevention.

2.5. Data analysis

The collected data were analyzed using SPSS 16 statistical software and the $p\text{-value} < 0.05$ was considered statistically significant. Descriptive statistics were used to compare demographic characteristics between the groups. The results showed that there was no statistically significant difference between the experimental and control groups regarding any of the demographic variables. Mean (standard deviation) or median (interquartile range) was used to describe the quantitative variables according to the conditions, and frequency report (percentage) 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 generalized linear model by GEE method was used to study the constructs during the design phase.

2.6. Ethical considerations

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.

3. Results

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). 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.

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 to 40 years	21	34.4	15	31.2	36	33.0	P = 0.412 df = 2 $\chi^2 = 1.77$
	41 to 46 years	23	37.7	14	29.2	37	33.9	
	47 to 55 years	17	27.9	19	39.6	36	33.0	
Number of children	1 to 2 children	42	68.9	24	50.0	66	60.6	P = 0.051 1df = 3.99 = χ^2
	3 to 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 Fishers 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 Fishers 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	
Variable name	subgroup	Control group		Experimental group		Total		Control group
		N	%	N	%	N	%	
Spouse's occupation	I do not have a spouse	1	2.1	2	3.3	3	2.8	P = 0.01 df = 3 Fishers 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	9	P = 0.003 df = 2 Fishers 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 Fishers 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	

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 = 0.000). 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 and self-efficacy could predict 29% and 27% of the variance in substance abuse prevention behavior, respectively.

Table 3
Regression analysis indices of HPM components before the intervention

Construct	Coefficient (B)	standard error	Standardized coefficient (β)	P-value	adjusted R2
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 affect	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

Table 4 represented that in 9 variables of 10 constructs related to the health promotion model, no statistically significant difference was observed between the experimental and control groups before the intervention program. The results also showed that there was 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 experimental group compared to the control group after the educational intervention.

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

Behavior		Before the Intervention	Two months after the intervention	P-value
	Intervention	3.91 ± 44.02	2.99 ± 45.84	0.010
	Control	5.00 ± 43.27	3.87 ± 42.56	0.437
	P-value	0.385	0.000	
Prior related behavior		Before the Intervention	Two months after the intervention	P-value
	Intervention	1.89 ± 9.13	1.47 ± 10.36	0.000
	Control	2.15 ± 9.04	1.27 ± 9.44	0.18
	P-value	0.76	0.002	
Perceived benefits of action		Before the Intervention	Two months after the intervention	P-value
	Intervention	3.74 ± 48.08	2.36 ± 50.46	0.000
	Control	4.08 ± 48.19	4.01 ± 49.08	0.375
	P-value	0.889	0.057	
Perceived barriers to action		Before the Intervention	Two months after the intervention	P-value
	Intervention	12.10 ± 28.41	4.70 ± 25.38	0.338
	Control	8.74 ± 27.88	3.75 ± 26.21	0.591
	P-value	0.511	0.494	
Perceived self-efficacy		Before the Intervention	Two months after the intervention	P-value
	Intervention	8.50 ± 36.11	2.69 ± 37.30	0.308
	Control	5.51 ± 35.17	4.17 ± 36.19	0.084
	P-value	0.543	0.022	
Individual influencers		Before Intervention	Two months after the intervention	P-value
	Intervention	3.22 ± 25.11	1.60 ± 28.21	0.000
	Control	3.20 ± 25.58	1.98 ± 26.48	0.229
	P-value	0.36	0.000	
Interpersonal		Before the	Two months after the	P-

influences		Intervention	intervention	value
	Intervention	5.23 ± 33.57	2.72 ± 34.43	0.425
	Control	4.18 ± 32.33	3.73 ± 33.02	0.212
	P-value	0.124	0.032	
Situational influences		Before the Intervention	Two months after the intervention	P-value
	Intervention	3.38 ± 33.85	2.44 ± 35.52	0.002
	Control	3.08 ± 33.71	2.43 ± 34.19	.0194
	P-value	0.589	0.005	
Competitors		Before the Intervention	Two months after the intervention	P-value
	Intervention	7.85 ± 24.18	5.38 ± 27.34	0.001
	Control	9.90 ± 25.73	5.91 ± 25.85	0.932
	P value	0.304	0.499	
Model		Before the Intervention	Two months after the intervention	P-value
	Intervention	4.16 ± 25.72	2.28 ± 26.26	0.656
	Control	3.07 ± 24.17	3.10 ± 23.42	0.224
	P-value	0.004	0.000	
Commitment		Before the Intervention	Two months after the intervention	P-value
	Intervention	2.77 ± 27.07	1.61 ± 28.26	0.007
	Control	2.16 ± 26.54	3.23 ± 26.15	0.778
	P-value	0.147	0.000	

Evaluating the regression analysis 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 affect 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 ($\beta = 0.32$).

Table 5
Regression analysis indices of the effect of education on behavior and the HPM constructs

Constructs	Coefficient (B)	Standard error	Standardized coefficient (β)	P- value
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 affect	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
Model	2.66 -	0.52	0.44 -	0.000
Commitment to plan of action	2.02 -	0.42	0.38 -	0.000

4. Discussion

The results of this study showed that the parents' prior behavior and behavior was 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 (25), Mazloomi Mahmoodabad (26), and Hossein Rezaei (27). 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 (28), Taheri (29), Dehdari (30), and Khodaveisi (28).

The results of this study and the conducted studies (31) discuss the design and implementation of interventions to prevent substance abuse in comparison with the competitor's preferences and demands, such as watching TV, using computer, and etc. The results indicated that after the intervention, the parents became more responsible for preventing substance abuse in their adolescents, and preferred this issue to watch TV, cyberspace, using the Internet, and relaxing.

In this study, it was shown that in order 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 (30) and Kamali (32). 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 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 (12, 33). 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 (34), Saelens (35), and Nikpour (36) also reported the positive effect of 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 (26) and in contrary to Shokoohi's study (37). 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 (38, 39). In Mirkarimi's study (40), 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 in order 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 (33, 41). Therefore, planning to empower the family to promote the status of substance abuse preventive behavior should be considered (42). 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.

4.1. Limitations

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.

5. 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 in preventing substance abuse. In addition to education, more measures are required to prevent substance abuse. In this regard, 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.

Abbreviations

HPM: health promotion model, Content validity ratio (CVR), content validity index (CVI).

Declarations

Ethics approval and consent to participate

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.

Consent for publication

Not Applicable

Competing interests

The authors declare that they not have any conflict of interest

Availability of data and materials

Not Applicable

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Authors' contributions

S.M.M and M.H contributed to the design of the study, was responsible for the management and retrieval of data, contributed to initial data analysis and interpretation, drafted the initial manuscript. H.J and M.H.R decided upon the data collection methods and responsible for the data analysis decisions. H.E.A conceptualized and designed the study, supervised all aspects of the study, critically reviewed and revised the manuscript, and approved the final manuscript as submitted. all authors read and approved the final manuscript

Conflict of interest

The authors do not declare any conflict of interest.

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