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Effects of a School-Based Interventional Program on Smoking Refusal Self-efficacy in Adolescent Females

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Abstract

Background: Education is considered as the most basic method for the prevention of tobacco smoking. Self-efficacy can be assumed as the best predictor of smoking behavior in adolescents.

Aim: The present study aimed to investigate the effects of a school-based interventional program on smoking refusal self-efficacy in adolescent females.

Method: This randomized controlled trial was conducted on 53 adolescent females in 2017. The participants were randomly divided into two groups of intervention (n=27) and control (n=26). The intervention group was provided with a smoking prevention program implemented five sessions a week in their school classrooms. On the other hand, the control group received the routine interventions. A researcher-made Smoking Refusal Self-Efficacy Questionnaire was completed before and one month after the intervention. Statistical analysis was performed in SPSS software (version 20.0) using Fisher's exact test, t-test, and Mann-Whitney U test.

Results: According to the results, 9 (34.6%) and 7 (25.9%) individuals in the control and intervention groups had smoking fathers, respectively. The two study groups were homogeneous in terms of smoking refusal self-efficacy before the intervention. Following the intervention, the mean self-efficacy scores in the intervention and control groups were estimated as 111.55 ± 13.1 and 93.53 ± 25.02 , respectively. There was a significant difference between the two groups regarding this variable after the intervention ($P=0.02$).

Implications for Practice: The school-based interventional program for smoking prevention in accordance with social skills training could effectively increase the level of smoking refusal self-efficacy in adolescent females.

Keywords: Adolescents, Intervention program, Females, Refusal, Self-efficacy, Smoking prevention

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Introduction

Tobacco smoking is considered as the leading cause of preventable early death in the current world (1). About 6 million people are losing their lives each year due to the consumption of tobacco. Moreover, it has been estimated that these figures and statistics will increase by 3.8 million mortalities in 2030 (2). Approximately, 90% of adults experience their first tobacco smoking before the age of 18 years (3, 4). Moreover, 80-100 thousand adolescents start tobacco smoking every day, which can be deemed as a major risk for public health (5). Tobacco smoking can also lead to high-risk behaviors, such as willingness to use drugs, alcohol, or marijuana (4, 6). Furthermore, smokers may suffer from more psychological-mental health problems, compared to the non-smokers (7).

According to the recent studies released by the World Health Organization (WHO, 2015), in Iran, the smoking-onset age has reduced to 14 years, and 7.5% of adolescents in the age group of 13-18 years have experienced tobacco smoking at least once. These findings indicate that the society would experience an increasing prevalence of tobacco smoking among adolescents in near future. Regarding this, the prevention of tobacco consumption can save millions of dollars, and consequently millions of lives (6, 8).

Worldwide studies on tobacco smoking among adolescents have also suggested that teen females are smoking as much as their male peers (9). Besides, according to the investigations performed in Iran, 66.7% of smokers experience tobacco smoking before 14 years of age (10). Moreover, studies have shown no difference between adolescent males and females in terms of first-hand smoking experience from the age of 14 years (11).

In this regard, puberty is considered as one of the important changes in teenage years. Such changes are physically and psychologically different in both genders. Hormonal changes related to menstruation can exclusively occur in female individuals. These changes are psychologically of utmost importance due to the incidence of pre-menstrual syndrome, followed by the use of relieving methods, medications, and narcotics. Therefore, adolescent females need to receive more attention from their family and society in terms of the onset age of risky behaviors (12).

Other factors affecting tendency towards tobacco smoking among female adolescents include involvement in emotional relationships but not-so-much strong ones, followed by being influenced by favorite men and development of higher inclination to fashion. In other words, a large group of adolescents start tobacco smoking to be trendy and even facing influences from others (13). The possession of pessimistic attitudes towards one's gender could be also considered as a factor shaping teen females propensity towards tobacco smoking (14).

Schools can be regarded as important places creating or preventing inclination toward substance abuse and delinquency (15, 16). Schools are the first social institutions affecting life in teenage years. This institution can determine the adolescents' quality of life and behaviors and exert a very deep and unique effect on their lives (17). Given the high potential impact of schools, they can be a place to prevent high-risk behaviors during adolescence.

In this regard, Botvin et al. (2000) taught social resistance skills and individual merit to primary school students. The results of the mentioned study revealed a decrease in the rate of cigarette smoking in the intervention group at the individual level. Moreover, the analysis of the findings showed that the annual prevalence rate of tobacco smoking and alcohol abuse reduced by 61% and 25%, respectively (18).

In another study, Barkin et al. (2002) investigated the relationship of social skills and attitudes towards substance abuse in adolescents with the onset of smoking in students. In the mentioned study, about 75% of the participants reported that they could not practice resistance skills, such as changing topics or leaving situations. They concluded that resistance skill training, emphasis on the self-efficacy of saying 'NO', and decision-making skills could lead to the reduction of substance abuse in teenagers (19).

Self-efficacy can be considered as one of the most effective predictors of smoking onset (7). As a main concept in numerous behavioral change models and theories, self-efficacy refers to social belief by an individual in their abilities to demonstrate a special behavior with the aim of creating certain consequences (20). In this respect, specific or situational self-efficacy can be defined as an individual's ability during practicing a special act (21). Therefore, smoking refusal self-efficacy refers to a person's ability to make the best use of unchangeable refusal strategies in smoking-onset situations (22).

Previous studies have suggested that teens would start smoking if they have low specific self-efficacy in stressful situations and even in circumstances of being offered by friends and peers (23). Therefore, it is essential to design interventions facilitating the enhancement of specific smoking refusal self-efficacy levels in adolescents and improvement of such self-efficacy when encountering with pressures from peers and friends (24).

According to the literature, education is the most basic tool and method for smoking prevention. However, the complexity of this issue has failed to control this problem. Accordingly, the implementation of routine education targeted toward giving information and awareness have been inefficient in the prevention of smoking behaviors. Regarding this, along with raising awareness, efforts should be made to identify other factors affecting tobacco smoking (18). Accordingly, Botvin et al. introduced life skills training as an interventional program preventing and reducing smoking tendency in the 1980s. They observed a 58% decrease in a preliminary study in this domain (25).

Smoking prevention interventions are of a wide variety. However, there is no evidence on the superiority of special educational programs for the prevention of smoking. A number of studies have directly investigated the effects of training programs on smoking behaviors, while others have focused on smoking refusal self-efficacy (26). It seems that the promotion of smoking refusal self-efficacy in adolescents could make them feel safe in smoking-onset situations (27).

Some studies have only emphasized on the enhancement of knowledge about smoking risks, which has little effect on smoking prevention. There are also several studies addressing only social skill training associated with substance abuse refusal in face-to-face or online situations. With this background in mind, the present study was conducted to measure the combined effect of increasing knowledge and skills related to smoking prevention. Given the rise in tendency towards tobacco smoking among adolescent females and uncertainty of smoking prevention programs, the current study aimed to investigate the effect of school-based intervention program on smoking refusal self-efficacy in teen females living in the city of Mashhad, Iran.

Methods

This randomized controlled trial was conducted on adolescent females enrolled in grade 10 of public high school in the city of Mashhad in 2017-2018. The reason for choosing the 10th graders was that the age of 16 years represents the onset of adolescence and also the impossibility of examining students under this age due to the cultural restrictions announced by the Department of Education.

The sample size was estimated by the PASS software and according to a study by Handayani et al. (2015) entitled as "The effect of self-efficacy for smoking-refusal program in junior high school males, Bengkulu, Indonesia" conducted based on Bandura's theory of self-efficacy, as well as the mean smoking refusal self-efficacy of 101.8 ± 4.7 (28). Considering 90% confidence interval, 5% significance level, and 0.5 effect size in self-efficacy scores, 22 individuals were estimated for each study group. However, given the 20% sample loss, 27 individuals were considered for each group (54 students in total).

The inclusion criteria were: 1) age of 16 years, 2) written informed consent of the parents, 3) no history of mental illnesses or physical disabilities, 4) no report on smoking by the parents, and 5) no history of attending in smoking prevention programs. On the other hand, the exclusion criteria were absence in one of the interventional sessions and participation in other educational programs during the study.

The instruments used in this study were a demographic form and researcher-made Smoking Refusal Self-Efficacy Questionnaire. The demographic form contained 14 items about personal information and family background, developed based on the research objectives and recent articles. This form was validated by 10 professors at Mashhad University of Medical Sciences.

The Smoking Refusal Self-Efficacy Questionnaire was designed by the research team due to the lack of the Persian version of the standardized Smoking Resistance Self-Efficacy Scale developed by Lawrance, its non-use in Iran, absence of localized items in the mentioned scale, cultural restrictions to use it for adolescents, nonexistence of similar tools for domestic use, and need to add more items to assess the awareness of smoking risks.

This questionnaire was developed based on the standardized steps of tool development, and its characteristics were normalized. The items of this research instrument were created using the

available similar tools. To this end, the items available in the Drug Avoidance Self-Efficacy Scale (29), Smoking Abstinence Self-Efficacy Scale (30), Educational Package on Attitude, Self-Efficacy, and Tobacco Use (31), and standardized Smoking Refusal Self-Efficacy Scale (32) were adopted.

The initial instrument was examined several times by the research team in terms of clarity and simplicity of the items, lack of overlaps, and relationship between the items and variables of Smoking Refusal Self-Efficacy Questionnaire. Then, the face and content validities of this questionnaire were determined. The qualitative and quantitative methods were employed to verify the content validity.

In order to determine the face validity, the questionnaire was distributed among 10 students, and then the unclear and repetitive items were subjected to correction. Furthermore, the qualitative and quantitative content validities of the instrument, as well as its characteristics, namely necessity, relevance, simplicity, and clarity of the items, were investigated. To this end, we used the comments of seven faculty members of the School of Nursing and Midwifery at Mashhad University of Medical Sciences holding PhD degrees in Nursing, and then made the necessary revisions.

Content validity ratio, item-content validity index (ICVI), and scale-content validity index were calculated according to Lasche's Table. Therefore, the items with the ICVI of 0.78 were considered as appropriate and remained in the research instrument. However, in order to make decision on the removal, alteration, and maintenance of the items with the ICVI of 0.70-0.78, they were revised through computing odds ratio, conditional probability, and Cohen's kappa coefficient (33). The reliability of the questionnaire in this study was determined through internal consistency rendering a Cronbach's alpha coefficient of 0.97.

The final questionnaire included 24 items investigating smoking refusal self-efficacy in three dimensions, namely emotional situations (12 items), social situations (5 items), and high-risk situations (7 items). Each item was scored based on a five-point Likert scale from 'very likely' (1) to 'not very likely' (5). This instrument had a score range of 24-120 with higher scores indicating higher levels of smoking refusal self-efficacy.

For the purpose of sampling, first, two all-girls high schools were selected out of the seven schools available in the District 7 of the city of Mashhad. The selected schools had the same conditions concerning socioeconomic aspect and school environment (i.e., presence or absence of parks or green spaces suitable for tobacco smoking). Subsequently, one grade 10 classroom was chosen from each school considering the possibility to participate in the program in terms of the classroom hours. Selection of schools and classrooms was carried out on the basis of convenience sampling method. In the next stage, the two classrooms were assigned into intervention and control groups via drawing from sealed envelopes.

After visiting the schools, consent forms related to the participants and parents were distributed. The participants were given three days to discuss the research objectives and contact the researcher if they had any questions. After three days and following the collection of the consent forms of parents and participants, the individuals meeting the inclusion criteria were recruited in the study. Then, each participant was assigned a specific code. The control group was also explained that they would receive routine school programs.

At first, the Smoking Refusal Self-Efficacy Questionnaire was completed in both groups. A pre-test was similarly administered to compare the two groups and, if necessary, adjust the basic differences between them. The intervention group received the smoking prevention program one session a week, for five weeks in classrooms and during the school hours. The intervention was performed in the form of lecture, group discussion, video clips, question and answer, and role-play.

The topics covered during the interventional program included stress management, knowledge about the contents of cigarette, short- and long-term smoking adverse effects on the body, effective communication, decision-making and problem-solving skills, as well as refusal skills (saying NO). The given intervention program was based on the Substance Abuse Prevention Training Package recommended by the State Welfare Organization of Iran, as well as the educational contents used in different studies verified by specialists in the field of psychology, mental health nursing, and public health. Four weeks after the end of the program, both groups simultaneously recompleted the Smoking Refusal Self-Efficacy Questionnaire. Table 1 summarizes the specifications of the training sessions held for the intervention group.

In all stages of the study, research ethics principles were considered. In this regard, after obtaining a

Table 1. Contents of the training sessions held for the intervention group

Sessions	Subject	Objectives	Training method	Time	Duration
First session	Stress management	Familiarity with the definitions and types of stress, effects of stress on life, specific stresses in adolescence, signs and symptoms of stress, importance of stress management and its reduction strategies (i.e., abdominal respiration, relaxation, and thought distraction techniques)	Video clips, Q&A, lecture, and practices in classrooms	First week	90 minutes
Second session	Awareness of smoking risks	Familiarity with the definitions of addiction, dangers of smoke and hookah, right beliefs, and misconceptions about tobacco smoking	Q&A, lecture, and video clips	Second week	90 minutes
Third session	Decision-making management and problem-solving skills	Decision-making training and its importance, different decision-making practices (i.e., emotional, impulsive, avoidance, subjective, ethical, and rational), problem-solving process, and decision-making	Q&A, lecture, group discussion, and practices in classrooms	Third week	90 minutes
Fourth session	Effective and interpersonal communication	Teaching about the importance of communication in life, definitions, types, and components of communication, principles of effective communication with others, communication facilitators, communication barriers, and communication skills (e.g., active listening and empathy)	Video clips, Q&A, lecture, and role-play	Fourth week	90 minutes
Fifth session	Being courageous and skill of saying NO	Teaching courage benefits and barriers, steps of saying NO, and recommendations for saying NO	Brainstorming, Q&A, lecture, and role-play	Fifth week	90 minutes

written approval from the Ethics Committee, an introduction letter was acquired from the School of Nursing and Midwifery and submitted to the Security Unit of Education Department at District 7 in the city of Mashhad. Written informed consent was obtained from the participants and their parents. Furthermore, in order to ensure the participants' confidentiality, the questionnaires were encoded. The subjects were also assured about the possibility of study withdrawal at any time. Moreover, after the completion of the study, the control group were asked to study the educational pamphlet. At the end of the study, one subject in the control group was excluded due to absence from the educational sessions and failure to complete the questionnaire after the intervention. Therefore, 53 participants were included in the statistical analysis.

After sampling and data collection, the data were entered into the Microsoft Excel software. As the accuracy of data entry was ensured, statistical analysis was performed in SPSS software (version 20.0). The normality of the dependent variables (i.e., the scores of Smoking Refusal Self-Efficacy Questionnaire in the dimensions of emotional, social, and high-risk situations, as well as the total score) was determined using the Shapiro-Wilk test based on skewedness and kurtosis.

Furthermore, the differences in the dependent variables in the intervention and control groups were also examined using the t-test and Mann-Whitney U test. Moreover, t-test, Mann-Whitney U test, Chi-square test, and Pearson correlation coefficient were employed to examine the similar distribution of demographic variables in the intervention and control groups (with a confidence interval of 95% and a significance level of 0.05).

Results

According to the results, 9 (34.6%) and 7 (25.9%) participants in the control and intervention groups had smoking fathers, respectively. The results of the independent t-test and Fisher's exact test showed that the two study groups were homogenous in terms of family type, parental education, birth order, number of siblings, household income, parental occupation, and presence of smoking individuals among friends and family ($P>0.05$). Moreover, the results of the independent t-test demonstrated a significant difference between the two groups in terms of the grade point average of the previous grade ($P=0.007$). Table 2 presents the demographic information of each group.

Table 2. Demographic characteristics information of adolescent girls in two groups of intervention and control

Group		Control (n=26)	Intervention (n=27)	P-value
Variable		mean \pm SD	mean \pm SD	
Grade point average in previous grade		17.61 \pm 1.3	16.33 \pm 1.41	P*=0.007
Number of sisters		0.8 \pm 1.03	23.1 \pm 1.1	P*=0.40
Number of brothers		1.3 \pm 0.9	0.7 \pm 1.3	P*=0.18
Birth order		2.1 \pm 1.4	2.03 \pm 3.1	P*=0.61
		Number (percentage)	Number (percentage)	P-value
Paternal education	Primary school	3 (11.5)	6 (22.2)	P**=0.69
	High school diploma	17 (65.3)	16 (59.2)	
	Bachelor's degree and higher	6 (23.8)	5 (18.2)	
Maternal education	Primary school	4 (15.3)	8 (29.6)	P**=0.28
	High school diploma	19 (73.08)	14 (51.8)	
	Bachelor's degree and higher	3 (11.5)	5 (18.5)	
Family type	Parents live together	23 (88.4)	23 (88.4)	P**=0.28
	One of parents has passed away	2 (7.6)	3 (7.6)	
	Parents have got divorced	1 (3.8)	1 (3.8)	
Paternal occupation	Employee	12 (46.1)	7 (25.9)	P**=0.20
	Self-employed	14 (53.9)	20 (75.1)	
Maternal occupation	Employed	22 (84.6)	23 (85.8)	P**=1.00
	Housewife	4 (15.4)	4 (15.2)	
Level of household income	1-2 million Tomans	9 (34.6)	12 (44.4)	P**=0.65
	2-3 million Tomans	15 (57.6)	12 (44.4)	
	\geq 3 million Tomans	2 (7.6)	3 (11.1)	
Presence of a smoker around	Father	9 (34.6)	7 (25.9)	P**=0.55
	Mother	0 (0.0)	3 (11.1)	P**=0.33
	Sister	2 (7.6)	1 (3.7)	P**=1.00
	Brother	1 (3.8)	1 (3.7)	P**=0.61
	Friend	1 (3.8)	6 (22.2)	P**=1.00

P*=independent t-test, P**= Fisher's exact test

The results of the Mann-Whitney U test revealed no statistically significant difference between the control (101.3 \pm 24.9) and intervention (102.7 \pm 22.9) groups considering the mean score of Smoking Refusal Self-Efficacy Questionnaire at the pre-intervention stage ($P=0.95$). However, the intervention (111.15 \pm 13.01) and control (93.5 \pm 25.02) groups were significantly different in this regard at the post-intervention stage ($P=0.02$). The intra-group comparison by the Wilcoxon signed-rank test showed no significant difference between the control and intervention groups considering the total mean score of Smoking Refusal Self-Efficacy Questionnaire in the pre- and post-intervention stages ($P=0.15$).

With regard to the self-efficacy questionnaire dimensions, no statistically significant difference was observed between the intervention ($P=0.18$) and control ($P=0.20$) groups considering the mean score of self-efficacy in emotional situations before the intervention. Likewise, one month after the completion of the intervention, the results of the Mann-Whitney U test demonstrated no statistically significant difference between the two groups in terms of this variable ($P=0.88$). However, the intervention group showed an increase in the mean score of self-efficacy in emotional situations from 46.6 \pm 12.7 to 55.07 \pm 7.8, which was statistically significant ($P=0.03$).

Table 3. Mean smoking refusal self-efficacy scores in adolescent females considering the related dimensions in two study groups

Dimensions	Smoking refusal self-efficacy	Group		Inter-group test results (Mann-Whitney U test)
		Control (n=26) mean ± SD	Intervention (n=27) mean ± SD	
Emotional	Before intervention	51.07±12.6	50.7±12.14	P=0.88
	Two months after intervention	46.6±12.7	55.07±7.8	P=0.03
	Intra-group test results (Wilcoxon signed-rank test)	P=0.20	P=0.18	
Social	Before intervention	21.9±4.6	22.2±0.9	P=0.96
	Two months after intervention	18.6±6.1	24.1±1.5	P=0.002
	Intra-group test results (Wilcoxon signed-rank test)	P=0.01	P=0.11	
High-risk	Before intervention	101.3±24.9	102.7±22.9	P=0.85
	Two months after intervention	93.5±25.02	111.5±13.01	P=0.09
	Intra-group test results (Wilcoxon signed-rank test)	P=0.79	P=0.17	
Total score	Before intervention	101.3±24.9	102.7±22.9	P=0.95
	Two months after intervention	93.5±25.02	111.5±13.01	P=0.02
	Intra-group test results (Wilcoxon signed-rank test)	P=0.15	P=0.15	

According to the results of the Mann-Whitney U test, there was no significant difference between the two groups in terms of the mean self-efficacy in social situations prior to the intervention (P=0.96). However, at the post-intervention stage, the intervention group had a significantly higher mean self-efficacy in social situations than the control group (P=0.002).

The results of the Wilcoxon signed-rank test also showed a significant difference in the control group in terms of the mean score of self-efficacy in social situations after the intervention, compared to that before the intervention (P=0.01). In this regard, this score decreased one month after the end of the intervention. However, no statistically significant difference was observed in the mean scores of the dimension of self-efficacy in social situations in the intervention group between both groups before and after the intervention (P=0.11).

According to the Mann-Whitney U test, there was no significant difference between the two groups regarding the mean self-efficacy in high-risk situations both before (P=0.85) and after the intervention (P=0.09). Intra-group comparison by Wilcoxon signed-rank test also showed that the mean score of self-efficacy in high-risk situations in the intervention (P=0.17) and control (P=0.79) groups had no statistically significant difference at the pre- and post-intervention stages.

The effect of the intervention on smoking refusal self-efficacy was investigated after matching it on the basis of grade point average (the only demographic variable with a statistically significant difference between the intervention and control groups) using linear regression model. The results indicated that this variable had no significant effect on the results (P=0.17).(table 3)

Discussion

Based on the results of the present study, the mean score of smoking refusal self-efficacy after the implementation of the training program was higher in the intervention group than in the control group. These results are consistent with the findings of a study performed by Handayani et al. (2015) investigating the effect of an interventional program based on Bandura's theory of self-efficacy (28).

In the mentioned study, the intervention group had a significantly higher mean score of smoking refusal self-efficacy, as estimated by standardized Smoking Resistance Self Efficacy Scale by Lawrance, than the control group.

In the mentioned study, the mean score of self-efficacy in emotional situations demonstrated a significant increase, compared to the value obtained in the present study due to the adoption of extra-curricular activities, classroom assignments, group formation, creation of smoking refusal messages, and implementation seminars. However, in the present study, the intervention was implemented in the form of lecture, video clips, question and answer, and role-play in the present study. These similar results reflect the effect of school-based intervention on awareness regarding smoking harms and social skills associated with smoking in the promotion of smoking refusal.

Accordingly, Nadason et al. (2016) investigating the use of a web-based smoking prevention program among adolescents obtained results that are in line with our findings (34). They also concluded that the web-based prevention program could delay the onset of smoking. The educational intervention in the study by Nadason et al. included giving awareness about smoking resistance and stress management techniques that are similar to those presented in the present study.

In the mentioned study, the students in the intervention group that were not smokers reported lower smoking rates (35%) 6 months after the implementation of the intervention. Therefore, Nadason et al. reported that the use of smoking prevention programs was effective in reducing early smoking among students. They used a multimedia web-based method, while in the present study, an in-person approach with various educational methods was employed. Furthermore, Nadason et al. utilized two items directly related to smoking behavior to assess such a behavior; however, Smoking Refusal Self-Efficacy Questionnaire was employed as a predictor of smoking behaviors in the present study.

Gharlipour et al. (2015) developed an educational intervention based on students' awareness of smoking complications and consequences and the enhancement of smoking prevention. They held three 40-minute training sessions using peer education method with the selection of the most favorite student and teacher based on all students' opinions in order to learn actively and increase the effect of the intervention. The results of the mentioned investigation showed that the mean scores of knowledge and functions related to non-smoking and second smoking in the intervention group were higher than those in the control group following the educational intervention (35). Although community health nurses were recruited for education, it was concluded that face-to-face training could effectively strengthen smoking prevention.

Other studies also examined the impact of other training methods on substance abuse prevention, such as a study by Zaidi et al. (2016) in which a five-session training course adapted to the construct of the theory of planned behavior was implemented, and the constructs of attitudes, subjective norms, behavioral control, and behavioral intention were measured (36). The results of their study also showed that the five-week training program could boost smoking prevention behaviors in the intervention group.

Heidarnia et al. (2016) indicated that the implementation of a six-week web-based distant educational program for smoking prevention, along with a three-hour workshop, could lead to a significant increase in the mean scores of the constructs of the prototype willingness model, including attitudes towards smoking, smoking intention, and willingness to consumption (37).

The results of a study conducted by Ra'aisi et al. (2014) on the mean scores of substance abuse refusal self-efficacy in teenagers undertaking a social skills training program also revealed that the mean score of self-efficacy in emotional situations significantly increased after the intervention (38). This score enhancement in the dimension of feelings and emotions is consistent with the results obtained in the present study, possibly because of cultural similarities between the study populations.

Although smoking behavior was not measured in this study due to cultural restrictions in Iran, as well as the short duration of the study, self-efficacy was identified as a predictor of behaviors based on observing a correlation between increased smoking refusal self-efficacy score and participants' higher knowledge and changes in attitudes. These findings are in agreement with the results reported in the majority of studies investigating the effectiveness of education on preventing substance abuse and related behaviors, such as the study by Botvin (39).

It should be noted that there was a reduction in self-efficacy score in the control group and an increase in this score in the intervention group possibly due to the negative effect of the conditions during the study, particularly the time of questionnaire completion after the intervention (e.g., approaching the

times of final exams and putting stress on students).

As a results of the training, the intervention group was less affected by possible incidents and even their scores were increased; however, such a rising trend in scores was not statistically significant. Given that both groups were compared in terms of self-efficacy and other underlying variables, there were judgments about the effectiveness of the intervention on the basis of the difference between the scores obtained by the intervention and control groups after the implementation of the intervention.

In a review study, Kleijn et al. (2015) investigating school-based interventions to prevent smoking in girls (40) found that such interventions had no statistically significant effect on cigarette smoking among these individuals considering the variable of gender. With regard to the results of a study performed by Melissa and the 10% increase in smoking refusal self-efficacy scores in the present study, it was concluded that interventions implemented based on in-person training within schools could not be significantly effective; moreover, they are not probably cost-effective and economical.

One of the limitations of this study is the non-evaluation of the effect of social skills training on smoking refusal behavior in students. The reason for this limitation is the impossibility of examining smoking behaviors directly in students owing to cultural restrictions dominating the society and the lack of any approval by the Education Department in this regard. With regard to the results of previous studies regarding the lower probability of using druse by adolescents with high self-efficacy, self-efficacy could be considered as a stage before behavior change.

Another limitation of the present study is the failure to control the intervening variables affecting self-efficacy scores, such as the level of intelligence in individuals and social status of adolescents' families. Furthermore, the use of self-report for substance abuse behavior could increase the possibility of unrealistic responses. Finally, the controlled research context and the unavailability of all schools and grades due to the sensitivity of the study subject made sampling, especially in lower age groups, more difficult. Therefore, there were attempts to minimize this limitation by selecting tenth graders as the point of adolescence onset.

Implications for Practice

Based on the findings of the present study, smoking prevention program targeted toward raising awareness about smoking risks and social skills training in an in-person manner could increase smoking refusal self-efficacy in adolescent females. Accordingly, it is recommended to formally and consistently use this method in schools and curriculums. It is further suggested to evaluate smoking refusal behaviors in future studies considering different age groups and using a larger sample size. Given the fact that self-efficacy in high-risk behaviors could not be significantly effective, it is recommended to consider the other mechanisms assisting smoking-onset prevention.

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Conflicts of Interest

None declared.

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