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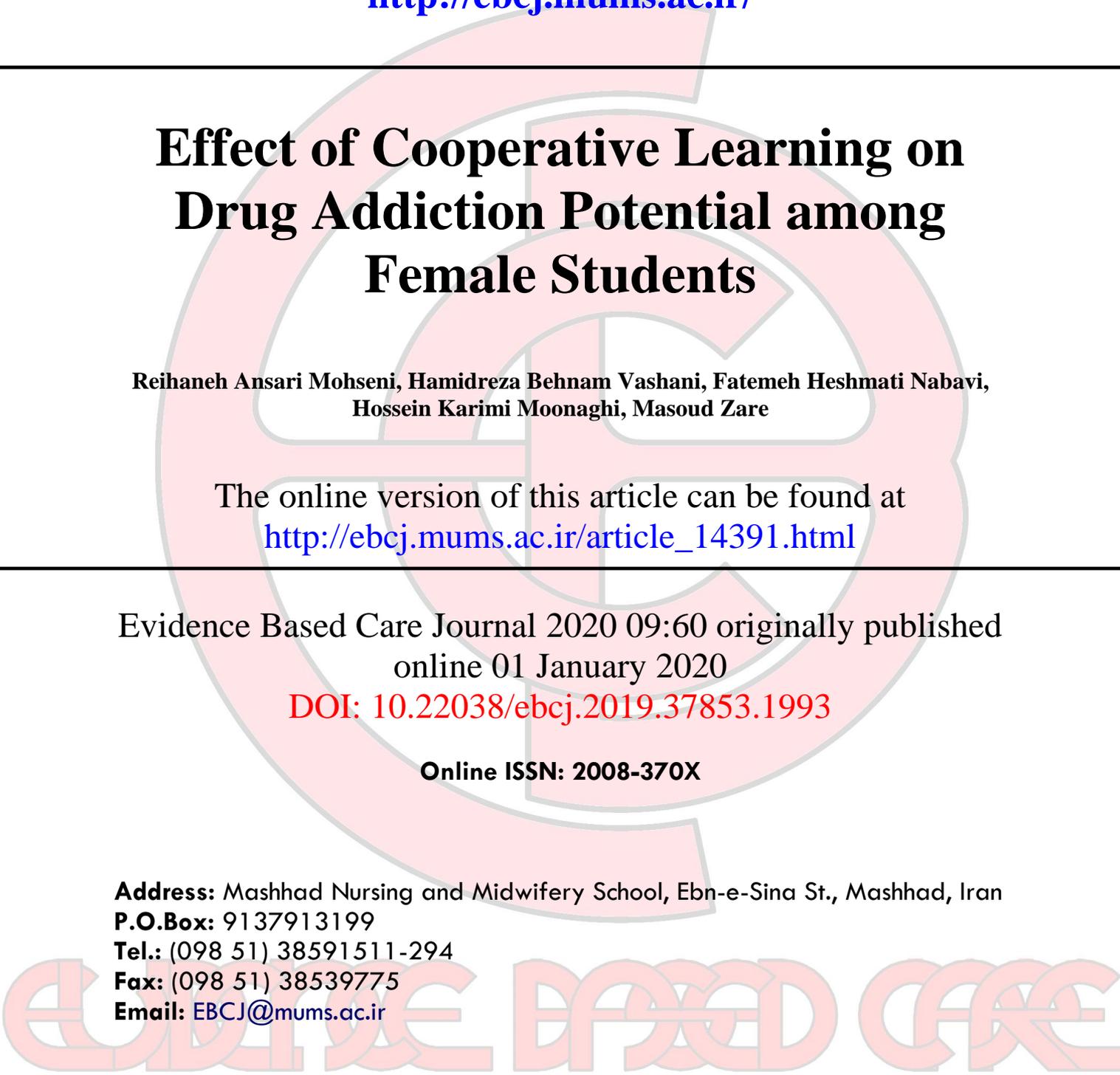
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Effect of Cooperative Learning on Drug Addiction Potential among Female Students

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Abstract

Youngsters' addiction potential has made adolescence a highly sensitive and critical period of life. Educational interventions can affect addiction prevention and cooperative learning is one of the active education methods. The present study aimed to determine the effect of cooperative learning on drug addiction potential among female students. This randomized controlled clinical trial was performed on 66 female students in 2018. The intervention group attended four cooperative educational sessions on addiction, physical, psychological, social and economic consequences and complications of drug abuse, and effective communication skills. On the other hand, the participants in the control group received education in the form of lectures. The addiction potential questionnaire was filled by all subjects before and one month after the intervention. Data were analyzed in SPSS software (version 16) using an independent t-test, paired t-test, and Wilcoxon test. According to the results, the two groups were homogenous in terms of all demographic variables. As evidenced by the results of the independent t-test, the mean score of addiction potential was significantly lower in the intervention group (10.3 ± 12.4), compared to the control group (2.7 ± 8.8) ($P < 0.001$). Our findings can help instructors select and implement the most efficient techniques of cooperative learning in order to prevent addiction among adolescents.

Keywords: Adolescents, Drug addiction, Female students, Primary prevention

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Introduction

Drug dependency and abuse are among the main global challenges of the current era. The associated complications include all cultural and social borders and threaten human health (1). Drug abuse is one of the main causes of communicable diseases, such as AIDS, tuberculosis, and hepatitis due to substance abuse, which seriously endangers the health of the whole society (2). The global prevalence rate of drug abuse among students has been reported as 2.1%, putting 136,000 students at serious risk of this problem (3). It is reported that 90% of drug users begin experimenting with drugs of abuse during early adolescence. On the other hand, the early onset of drug use dramatically increases the risk of lifelong substance abuse (4). Despite the common belief that addiction is a behavior mostly observed in men, the numbers of female drug users continue to rise (5). Addiction treatment in these individuals is challenging due to gender-related traits, such as physical problems and family support (6).

Active teaching techniques nowadays have found a special place in educational settings. In this regard, one of the active teaching methods that have attracted special attention is cooperative learning (7). Working in groups not only increases active participation among students but also improves social skills and enhances drug independence in these individuals. Nevertheless, the effectiveness and value of various educational methods is a debated issue. Therefore, filling knowledge gaps can perform a leading role in the improvement of policies, planning, and interventions. Considering that adolescence is the most sensitive period for drug abuse, it needs special attention and appropriate programs (8). On the other hand, female adolescents are more vulnerable to this problem and run a considerable risk of the onset of substance abuse and its negative social consequences. With this background in mind, the current study aimed to evaluate the effect of cooperative learning on drug addiction potential among female students (9). Cooperative learning encompasses a myriad of ways through which the classroom is managed flexibly and efficiently. It is so wide in its scope that any teacher can use it based on the situation (10). The practical part of this approach is to demonstrate the diversity and multiplicity of cooperative learning methods. Cooperative learning is a general term referred to different ways of organizing and directing classroom instruction. Many researchers have measured and evaluated the fundamentals of participatory learning in terms of various terms and variables (11). Studies have indicated that educational interventions have been carried out to prevent addiction in females.

Methods

This randomized controlled clinical trial was performed on 12th-grade female adolescents in two public high schools in Mashhad, Iran, in 2018. From the very beginning, the researcher was aware of the fact that the results would be more reliable if both groups were selected from one school. However, the leakage of information among students would reduce the reliability of the results in doing so. Therefore, the intervention and control schools were selected from a region, residents of which were socially and economically categorized in one class. In addition, the students were homogenous in terms of grade and discipline. Ethical considerations included obtaining a license from the ethics committee, receiving written consent from the participants, ensuring the students of the confidentiality terms regarding their personal information and providing a general explanation of the results upon the completion of the study. Since the dependent variable in the current research (score of addiction potential) was of a quantitative type, the sample size was estimated using the formula of "comparison of mean and standard deviation in two communities".

The sample size was calculated using the results of pilot research. In this regard, we applied the mean and standard deviation of addiction potential scores of 20 individuals at the post-intervention stage (10 per each group). A total number of 26 subjects were allocated to each group. In addition, the critical value was considered (1.96) for a 95% confidence level and (0.84) for 90% test power. Nonetheless, considering the possibility of sample attrition, 36 subjects were selected for the intervention group, two of whom were eliminated due to absence from meetings and one was removed from the study owing to the incomplete questionnaire. On the other hand, 37 participants were assigned to the control group, out of whom two subjects were eliminated due to non-attendance in meetings and two other participants were removed owing to incomplete questionnaires. On a final note, each group encompassed 33 participants, and the data of 66 students were subsequently analyzed. Inclusion criteria entailed being a high school student and having no history of participation

in educational programs of drug addiction prevention. On the other hand, exclusion criteria included unwillingness to cooperate with the researcher, non-attendance in meetings for more than one session, and incomplete questionnaires.

The research tools included a demographic characteristics form which was modified by studying related papers and books. In addition, an addiction potential questionnaire (12) was used which includes 36 items and five polygraph items. The mentioned questionnaire is scored on a three-point scale, from completely disagree (zero) to completely agree (three) and involves two factors of active and passive potential. In this questionnaire, the minimum and maximum scores are 0 and 123, respectively (108 excluding the polygraph items). In this respect, the higher score indicates the greater potential for addiction and another way round (Zargar, 2006). Given the scoring of the items based on the Likert scale, the reliability of the tool was confirmed using the internal consistency method. In this regard, addiction potential was assessed in 15 female students at one time. Cronbach's alpha was estimated at 0.88, 0.91, and 0.81 for the total score, active, and passive dimensions, respectively. Sampling was carried out by dividing two schools into test and intervention groups by lottery method. Thereafter, we randomly selected one grade (12th grade) and discipline (humanities) using the same method. One of the 12th-grade humanities classes were selected from each school by lottery method. At this stage and after performing a pretest, the educational program of addiction prevention intervention by cooperative learning was carried out in the form of four 90-minute sessions for four weeks. The educational program included awareness of addiction (physical, psychological, social, and economic consequences of drug abuse), effective communication skills, and the skill of saying no (Table 1). It is worthy to note that the educational content was provided in a booklet using various resources (13-17) with the approval of educational experts. In order to conduct cooperative learning, the students were initially assigned to six groups of five-seven.

Table 1. Summary of training sessions held in the intervention group

Sessions	Duration	Topic	Goal	Education method	Time
First session	90 minutes	The physical and psychological consequences of addiction	Familiarity with the definition of addiction, the physical effects of addiction and smoking, the psychological effects of addiction, and myths about drug abuse	Cooperative learning	First week
Second session	90 minutes	The social and economic consequences of addiction	Familiarity with social complications of addiction, occupational and educational complications, family complications, and economic complications of addiction	Cooperative learning	One week after the first session
Third session	90 minutes	The skills of effective communication	Teaching effective communication skills, types of communication (verbal and non-verbal), basic communication methods, core communication skills, adaptation skills with others, friendship skills, and the impacts of effective communication	Cooperative learning	One week after the second session
Fourth session	90 minutes	The skill of saying no	Teaching the skill of saying no, types of saying no (saying no to oneself, saying no to others), saying no when necessary, barriers to implementation of the skill of saying no, and different ways to say no	Cooperative learning	One week after the third session

Table 2. Mean and standard deviation of total score of drug addiction potential and its dimensions among students in the intervention and control groups

Variable of addiction potential		Intervention group	Control group	Intergroup test result
		Mean±standard deviation	Mean±standard deviation	
Total score of addiction potential	Before the intervention	29.4±17.0	28.5±13.2	*P=0.68
	After the intervention	19.1±8.3	25.8±11.5	*P≤0.008
	Difference between before and after	-10.3±12.4	-2.7±8.8	*P≤0.001
	Intragroup test results	¥P≤0.001	¥P≤0.02	
The score of active addiction potential dimension	Before the intervention	19.2±12.8	18.6±10.6	*P=0.55
	After the intervention	13.0±5.4	15.7±8.7	*P≤0.04
	Difference between before and after	-6.2±10.4	-4.9±6.6	*P≤0.03
	Intragroup test results	¥P≤0.001	¥P≤0.01	
The score of passive addiction potential dimension	Before the intervention	10.2±3.3	9.9±2.3	*P=0.41
	After the intervention	6.1±3.8	10.1±3.0	*P≤0.003
	Difference between before and after	-4.1±3.3	-0.2±3.4	*P≤0.03
	Intragroup test results	¥¥P≤0.001	¥P=0.77	

¥ Paired t-test

¥¥ Wilcoxon test

*Independent t-test

Firstly, the cooperative learning method and expectations from all members of the intervention group were explained. The educational content was then provided to all participants and they were asked to study the content at a specific time. In doing so, the content was divided between the members and each person was supposed to read specific pages of the text and explain them to other team members. Consequently, the members actively engaged in a group discussion. After 35-40 minutes, two members of each group were replaced clockwise by the members of the other group. Once more, the members of each group reviewed the training materials within a specific time period (5-10 minutes) and shared their learning experiences with each other. Subsequently, the members returned to their own groups and shared their learnings with the group members within a specific period of time (5-10 minutes). During the session, the researcher answered the students' questions, monitored group discussions, and guided the group members. Thereafter, three to four people were selected by the researcher to provide the entire content for the class, and students were asked to make additional comments. Finally, the researcher provided a summary of the presented content and answered the students' questions (18). On the other hand, the students in the control group received routine lecture method. According to similar studies, a posttest was performed in both groups four weeks after the program to assess the durability of training effects. In addition, the impact of the pretest on the posttest was controlled by comparing the differences before and after the scores in both groups.

Data were analyzed in SPSS software (version 16) using descriptive statistics (mean, standard deviation, and frequency distribution) to describe the demographic characteristics of the participants in two groups. In addition, the normal distribution of quantitative variables was evaluated using inferential statistics including Kolmogorov-Smirnov and Shapiro-Wilk tests. Furthermore, Chi-square, Fisher's exact test, independent t-test, and Mann-Whitney U test were used to assess the homogeneity of the groups in terms of confounding and underlying variables. Moreover, the independent t-test was used for intergroup comparison, while the paired t-test or Wilcoxon test were applied for intragroup comparison. In addition, the two-way analysis of variance and Pearson's correlation coefficient were exploited to assess the relationship between the confounding and underlying variables with the dependent variables. In the current study, the confidence interval and level of significance were considered 95% ($\alpha=0.05$) and 0.05, respectively.

Results

According to the results of Chi-square and Fisher's exact tests, the two groups were homogeneous in terms of educational level, occupational status, history of parental divorce and addiction, family's

financial status, and GPA (grade point average), with the exception of the number of family members.

According to the independent t-test results, no significant difference was detected between the intervention and control groups before the intervention in terms of the mean score of addiction potential ($P=0.68$). However, one month after the intervention, the decrease in the score of addiction potential was 6.7 higher in the intervention group, compared to the control group. According to the independent t-test, this difference was statistically significant ($P\leq 0.001$). In addition, the results of intra-group comparisons using paired t-test demonstrated that the intervention group had a greater decrease, compared to the control group ($P\leq 0.001$).

In addition, the results pointed to a lack of a significant difference between the intervention and control groups before the intervention regarding the active dimension of addiction potential ($P=0.55$). Nonetheless, the decrease in the score of the active dimension of addiction in the intervention group was 2.7 higher, as compared to the control group. In this regard, the independent t-test results revealed a significant difference ($P\leq 0.04$). Furthermore, the score of the intervention group was significantly higher in the intervention group after the intervention, compared to before the intervention ($P=0.03$). The results of intergroup comparison with paired t-test noted a higher decrease in the intervention group, compared to the control group ($P\leq 0.001$).

As evidenced by the obtained results, no significant difference was observed between the intervention and control groups before the intervention in terms of the mean score of the dimension of passive addiction potential ($P=0.41$). Nevertheless, one month after the intervention, the score of this dimension significantly decreased in the intervention group, while it slightly increased in the control group. In this connection, the results of the independent t-test were suggestive of a statistically significant difference ($P\leq 0.003$). Furthermore, the difference in the score of the dimension between the two groups after the intervention indicated a significant difference ($P\leq 0.03$). The results of intergroup comparison using the paired t-test also reported a significant decrease in the dimension of addiction potential only in the intervention group ($P<0.001$).

In the present study, the two-way ANOVA was used to evaluate the effect of underlying and confounding variables on the total score of addiction potential and its dimensions. Accordingly, the group impact was significant in all areas ($P\leq 0.05$). However, the other items, the impact of variables, and their interaction were insignificant. It is noteworthy that the intervention and control groups were homogeneous in terms of all variables. As illustrated by the results, there was a reverse correlation between the GPA of students and their overall score of addiction potential. In other words, the higher GPA of students is indicative of their lower addiction potential. According to Pearson's correlation coefficient, the correlation was significant ($r=-0.27$).

Implications for Practice

As evidenced by the results of the present study, the cooperative learning method can exert a dramatic impact on the teaching of addiction potential. Therefore, our findings can improve the knowledge of school health nurses and instructors regarding addiction prevention programs and proper educational planning in this field. In addition, the application of the present study results can help education authorities select and use a new method with scientific evidence in order to select and implement the best and most efficient technique to prevent addiction and teach this critical issue to adolescents. This can be achieved by holding educational classes, seminars, and workshops to familiarize the authorities with the cooperative learning method and emphasizing the timely education of students. It is recommended that this method be continuously used at the level of schools and in the curriculum of adolescents, as well as at lower ages. Moreover, it is suggested that future studies be conducted on the effect of cooperative learning on the reduction of drug addiction potential among female students at other grades and male students.

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Conflicts of Interest

All authors have disclosed no conflicts of interest.

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