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SURVEY THE EFFECT OF EDUCATIONAL INTERVENTION BASED ON PRECEDE-PROCEED MODEL ON THE STRESS MANAGEMENT OF FEMALE STUDENTS IN THE STATE HIGH SCHOOLS IN RASHT CITY

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ABSTRACT

Background and Purpose: Stress is one of the aspects of daily life of adolescents that can cause physical and psychological problems. Stress management may increase their ability to deal with stress. Therefore, this study aimed to determine the effect of educational intervention based on Precede-Proceed model on stress management of female students in the state high schools in Rasht City in 2016-2017.

Method: The present study is an interventional randomized controlled trial (RCT). The research population consisted of 127 female high school students in second grade of Rasht City in 2016 which were selected by simple random method. Demographic questionnaire, stress management domain for HPLP II questionnaire, and reliability and validity researcher-made questionnaire based on Precede-Proceed Model were used as the research tool. Data were collected in two stages of pre-test and 45 days after intervention. Descriptive statistical tests and tests such as Kolmogorov-Smirnov, Mann-Whitney, Wilcoxon and Pearson correlation were used in the form of spss-21 software to analyze the information.

Results: The results showed that there was a significant difference between the mean and the median scores of knowledge, attitude, behavior and stress management among students in the educational intervention group before the intervention, and with the control group after educational intervention.

Conclusion: According to the results, and the significance of educational intervention based on the Precede-Proceed Model on stress management of students, stress management training is felt in school curriculum.

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Introduction

Twenty-first century is called the century of pressure, anxiety, and stress with rapid changes in an ecological structure [1]. No one experience a life without stress [2]. Naturally, everyone needs a certain amount of pressure to do their best performance, but stress is created when pressure is more than the person's coping ability [3]. It is often thought that adolescence is a time of stress [4]. In fact, the adolescents are more stressed than any other age group [5]. Drug abuse, violence and depression in adolescents and even irresponsible suicide are the result of a stressful life which occurs in the

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absence of healthy coping methods with the consequences of stress [6]. Stress is also associated with the important mental health problems including higher levels of depression and anxiety symptoms [7]. According to the World Health Organization (WHO), one out of 5 people in the world is adolescent and among 1.2 billion adolescents' population, 85% of them live in the developing countries [8]. One of the most important age groups in every society is adolescents group which their health is considered to be an important part of community health [9]. In 2013, more than 30% of adolescents reported experiencing anxiety, depression and discomfort due to stress [10]. In Kordi study, the prevalence of moderate to severe stress was reported 21.8% in Mashhad City [11]. In Turkey, Bayram also reported 27% the prevalence of moderate to severe stress [12]. The stress effects also depend on the perception of stressors, skills, capacities, and also personal and social resources to deal with potential stressful situations [13]. Adolescent girls may be more vulnerable to negative stress than adolescent boys [14]. The studies have shown that teenage girls feel more stressful than teenage boys; the stress management training reduces stress in girls and increases their capabilities [15]. Stress management involves an increase in the ability to control one's self when faced with situations, people, events and excessive demands [16]. Stress management increases the individuals' ability to reduce stress and adapt to stressful situations [17]. The World Health Organization considers mental health as a very important part of health, and plans to promote it [18]. For this reason, worldwide attention is focused on early prevention of mental illness [19]. As the health promotion behaviors are like other trained health behaviors, so the necessary training in this regard should start from school [20]. Nurses, especially community health nurses at school, can play an important role in the training of health promotion behaviors and the change the wrong behaviors and prevention of diseases during adolescence and promote adolescent health [21]. Education should be based on theories and defined models to obtain useful and effective results in this field [17]. Choosing a health education model is the first step in the planning process for health education and behavior change [22]. One of the most widely used health planning models is "Precede-Proceed Model" [23]. The phases of Precede-Proceed Model l include: the first phase: social diagnosis, the second phase: epidemiological diagnosis, the third phase: educational and ecological diagnosis (predisposing, reinforcing and enabling factors), the fourth phase: management diagnosis, the fifth phase: Implementation, the sixth phase: process evaluation and the seventh phase: impact assessment and the eighth phase: results assessment [24].

Therefore, it is attempted to design and implement an educational intervention based on Precede-Proceed Model on the stress management of high school girls in Rasht City.

Materials and Methods

The present study is a randomized controlled trial (RCT) one. A multi-stage random sampling was conducted in March of this year after obtaining the necessary permissions from the University of Medical Sciences and Education. Restrict one was selected randomly among two restricts of Rasht City Education Ministry. Two state high schools out of twelve ones were selected by Lottary district one. One school assigned in the control group and one school in the intervention group randomly. The third-year and pre-university grades did not allow participation in the study due to the difficulty of the lessons. There was not the eleventh grade due to the change of educational system, and two classes from the 10th grade one in each school were enrolled in the study. Sample size (57 ones) was determined with 95% confidence in each group based on the similar studies [1]. Considering 20% sampling rate, 71 people were determined in each group. Ethical considerations were stated for the steps of the study, confidentiality of the information, announcing the results in general, allowance to leave the research at each step of the study and obtain written consent letter of the students from their parents. In the end, a complete set of educational packages used in the intervention group was provided to the control group and the results were given into Education Ministry.

Inclusion criteria: studying in high school and the class under study, voluntary presence in the study, completion of written consent letter by students after obtaining their parents' permission and completing the questionnaire delivered to the researcher.

Exclusion Criteria: exit criteria for changing a class or high school under study and not willing to continue study and absence in the classroom more than two sessions

The written questionnaire was used as the data collection method in this study. Demographic questionnaire consisting of 16 questions and the Stress management domain of Standard Health Promotion Life Style Profile II contains 8 questions. Likert Score from never to ever (never = 1, sometimes = 2, often = 3, always = 4), which score is from 8 to 32 was used. A higher score suggests better stress management. A researcher-made questionnaire was used in the framework of the Proceed structures including the questions on predisposing factors (10 questions of knowledge, 9 questions of attitude). Knowledge in the field of stress and ways to deal with it (0=wrong answer, 1= I do not know and 2= correct answer) has 0-20 score. A higher score meant the students' higher awareness. The attitude with 5 scale Likert is scored 9-45 in this way: 1= completely disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= completely agree. A higher score indicates a more positive attitude toward the stress risks. The Stress Coping Strategies Questionnaire consisted of 15 questions, 9 questions were answered yes and no, with a score of 0 and one, one question 1-2, another question 0-3, and 4 questions measured the rate of the desired behaviors which has is 0-3 scores; the score of questions is 0-26. A higher score indicates a more effective coping behavior against the stress. This questionnaire was distributed to a 12-silver panel consisting of Faculty members of Faculty of Nursing and Midwifery of Shahid Beheshti and Rasht Health Faculty, to determine the validity of the

questionnaire based on PRECEDE- PROCED model. Knowledge questions had 5 CVI questions above 0.90 that remained unchecked, and 5 questions had CVI from 0.80 to 0.90, which were partially checked. All questions of attitude had CVI between 90/0 and 100/0, which remained unchecked. Questions of behavior had 10 CVI questions between 0/90 to 100/0, which remained unchecked.One question had CVI=0.8 4, which was partially checked. Stress management domain of Standard Health Promotion Life Style Profile was routinely verified by Mohammadiyan et al. had a CVI=0.84 [26].

To test the reliability, the test-retest method (26 students per week) was used. The reliability coefficient of knowledge test and re-test was 99.9%, the attitude was equal to 99.4% and the stress management domain of HPLP II questionnaire was 99.08%, which represents the highly desirable repeatability of these tools. Then the questionnaires were distributed among the students and it was answered to the oral questions of the students. After completing pre-test questions and determining the structures with predictive stress management, the predisposing factors of knowledge PRECEDE model ($P = 0.0001$, $\beta = 0.042 \pm 0.127$), attitude ($P < 0.0001$, $\beta = 0.319 \pm 0.048$) and behavior ($P < 0.0001$, $\beta = 0.461 \pm 0.083$). According to the average responses and focus group discussions, educational content was compiled using authoritative books and articles and the faculty members' confirmation.

The research was done based on the precede planning model. The questionnaire model was composed of eight steps; The first step (social evaluation): The focus group discussion method with random sampling of 10 students, evaluated the students' stressful problems. In the second step (epidemiological evaluation), statistics and data on stress issues were evaluated and collected the information about behavioral and environmental factors associated with stress (genetic evaluation was not possible). In the third stage, educational evaluation of predisposing factors (knowledge, attitude) was studied. The enforcing and enabling agents were not reviewed due to lack of time. The ecology was collected through a questionnaire and a focal group discussion. In the fourth step of managerial and political evaluation, the coordinating arrangements for the intervention and satisfaction of the participants in the schools took place. In the fifth step (program execution), six one and one and half hour training sessions for intervention group in two classrooms with 35-36 students. The educational CDs, including recording audio file, taught PowerPoint and educational content were given to the students to influence the knowledge and attitude structures (Table 2) in order to practice daily relaxation exercises at home and were encouraged by the researcher and the sport teacher as a reinforcement factors during the study. In the sixth step, evaluation of the implementation costs process was reviewed. The seventh step of impact assessment was performed 45 days after the end of the post-test intervention. The number of dropouts in the intervention group was 8, 4 ones for the absence and 4 ones for not willing to fill the questionnaire. In the control group, the number of dropouts was 7, for not willing to fill in the questionnaire. The results were analyzed by SPSS 21 software and descriptive statistics and tests such as Kolmogorov-Smirnov, Mann-Whitney, Wilcoxon and Pearson correlation. The scores were compared in the intervention and control groups before and after the intervention. Eighth step (outcome assessment) was not possible due to the limited time [27].

Findings

The mean age of the intervention group was 15.52 ± 0.53 and the control group was 15.71 ± 0.60, which were not significantly different ($p = 0.056$).Also, there were no significant differences in terms of variables such as number of family members, birth rate, life with parents, father's degree, housing status and grade average of the last half-year ($p > 0.05$).There was no significant difference in knowledge and attitude before intervention in two groups but there was a significant difference after educational intervention.

Before the educational intervention, mean, median behavior and stress management of the control group were significantly higher than the intervention group but after intervention, the difference between stress management and control group was significantly higher than the control group.

The changes in stress management score in the intervention group with behavioral changes ($p < 0.001$ and $r = 0.412$) had statistically significant correlation however, it was not correlated with other variables. This correlation in control group was significant only with behavioral changes as (Border Line) ($p = 0.056$, $r = 0/240$).

Comparison of changes in stress management score in terms of demographic variables indicates that stress management score changes have not significant relationship with any of the demographic variables ($p < 0.05$).

Investigating the effect of educational intervention on the stress management score with controlling the intervention variables and logistic regression results in Backward method show that after matching, the most important variable influencing the changes in the stress management score was the educational effect intervention, Odds Ratio= 4.6 95%CI:1.8-11.7

Table 1. Comparison of Individual-Social Variables in Two Study Groups

	Study Group					
	Control Group		The educational intervention group			
P	Column N%	Count	Column N%	Count		
.336	18.8%	12	20.6%	13	Less than 3	the number of family members
	54.7%	35	63.5%	40	4	

	26.6%	17	15.9%	10	5 and more	
.234	62.5%	40	66.7%	42	First	Birthday rate
	21.9%	14	27.0%	17	Second	
	15.6%	10	6.3%	4	Third and more	
.991**	98.4%	63	98.4%	62	yes	Living with parents
	1.6%	1	1.6%	1	No	
.003*	37.5%	24	27.0%	17	Under Diploma	Father's degree
	46.9%	30	30.2%	19	Diploma	
	15.6%	10	42.9%	27	Academic	
	100.0%	64	100.0%	63	Total	
.392	3.1%	2	6.3%	4	Health & Therapy	Father's Degree
	96.9%	62	93.7%	59	Non-Health & Therapy	
.000	17.2%	11	7.9%	5	Worker and unemployed	Father's job
	20.3%	13	54.0%	34	Employee	
	62.5%	40	38.1%	24	Other	
.001*	34.4%	22	15.9%	10	Under the diploma	Mother's education level
	57.8%	37	52.4%	33	diploma	
	7.8%	5	31.7%	20	Academic	
.011*	0.0%	0	9.5%	6	Health & Therapy	Mother's degree
	100.0%	64	90.5%	57	Unsafe and therapeutic	
.025*	87.5%	56	71.4%	45	Housekeeper	Mother's job
	12.5%	8	28.6%	18	Employed	
.569	73.4%	47	77.8%	49	Personal	Housing status
	26.6%	17	22.2%	14	Lease etc.	
.026*	56.3%	36	36.5%	23	Lower than one million	Average monthly income of family members
	43.8%	28	63.5%	40	1-3 millions	
.112	14.1%	9	3.2%	2	Lower than 15	The last half-year's average
	14.1%	9	9.5%	6	15-17	
	40.6%	26	46.0%	29	17-19	
	31.3%	20	41.3%	26	Higher than 19	

Table 2. Summary of educational content of intervention sessions

Provider	Intervention method	Educational content	Educational sessions
Researcher	Lecture, PowerPoint presentations, questions and answers	Introduction, Stress Definition, Stress Symptoms, and Stress Management Methods	First session
Psychologist with the presence of a researcher and sports supervisor	Lectures, questions and answers and practical work	Practical training on diaphragmatic respiratory relaxation	second session
Researcher	Lecture, PowerPoint View, Questions and Answers Group discussion in the group template (8-10 ones) and Brainstorming	Problem-solving skills, Brainstorming and decisively expression	third session
Researcher	Lecture, PowerPoint View, Questions and Answers Group discussion in the group template (8-10 ones) and Brainstorming	Time management, correct nutrition	fourth Session

Researcher	Lecture, PowerPoint View, Questions and Answers Group discussion in the group template (8-10 ones) and Brainstorming	anger management and express the benefits and barriers of exercise and physical activity	fifth session
Psychologist with the presence of a researcher and sports supervisor	Lecture, PowerPoint View, Questions and Answers Group discussion in the group template (8-10 ones) and Brainstorming	Writing stressful cases and effective strategies coping with stressors	Sixth session

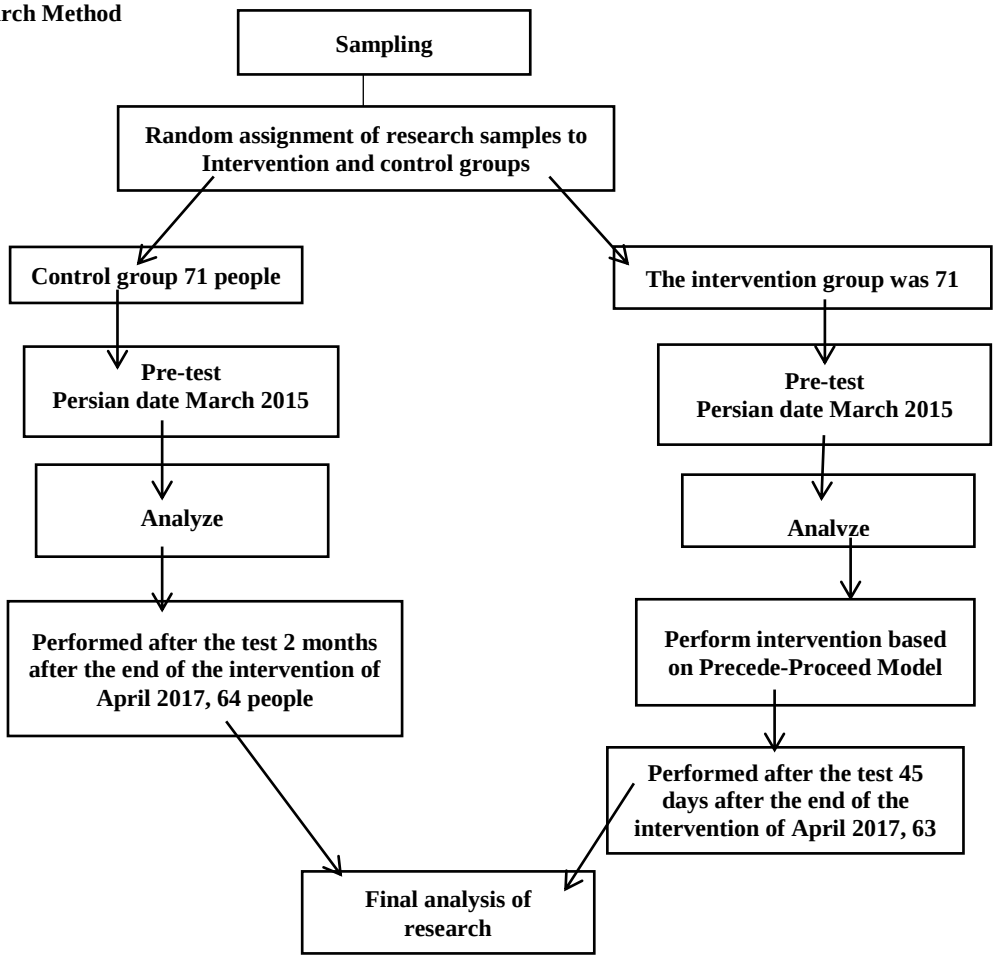
Table 3. Comparison of knowledge, attitude and behavior (before and after) scores and score changes in two intervention and control groups

	Study group			
P	Control group	Educational intervention group		
0.214	9.11	9.54	Average	Knowledge score before training
	2.34	2.09	Standard deviation	
	9.00	10.00	Mean	
0.0001	9.20	13.21	Average	Knowledge score after training
	2.28	3.04	Standard deviation	
	9.00	14.00	Mean	
0.0001	.09	3.67	Average	Knowledge score changes
	3.25	3.73	Standard deviation	
	.00	4.00	Mean	
	0.0001	0.0001		Significant level p
0.993	33.92	33.98	Average	Attitude Score before Training
	4.42	3.95	Standard deviation	
	34.00	35.00	Mean	
0.002	33.41	36.13	Average	Attitude Score After Training
	4.51	5.19	Standard deviation	
	33	37	Mean	
0.0001	-.52	2.14	Average	Attitude Score Changes
	3.70	4.62	Standard deviation	
	-.50	3.00	Mean	
	0.0001	0.001		Significant level p
.0120	16.9	15.4	Average	Behavioral score after educational intervention
	3.2	3.7	Standard deviation	
	17.0	15.0	Mean	
.0090	15.88	18.71	Average	Behavioral score after educational intervention
	3.75	7.68	Standard deviation	
	16.00	18.00	Mean	
.0001	-.98	3.32	Average	Behavioral score changes
	3.73	8.48	Standard deviation	
	0.063	0.0001		Significant level p

Table 4. Comparison of Stress Management scores (before and after) and score changes as well as the percentage of changes in the intervention and control groups

The intervention group				
P*	control group	Educational intervention group		
0.001	19.59	17.29	Average	Stress management score before educational intervention
	3.52	3.56	Standard deviation	
	20.00	17.00	mean	
	14.00	8.00	minimum	
	32.00	25.00	maximum	
0.477	18.64	19.44	Average	Stress management score after educational intervention
	3.52	4.27	Standard deviation	
	19.00	19.00	mean	
	10.00	12.00	minimum	
	27.00	29.00	maximum	
0.0001	-.95	2.16	Average	Stress management score changes
	3.23	3.49	Standard deviation	
	-1.00	3.00	mean	
	-14.00	-5.00	minimum	
	6.00	9.00	maximum	
	37 57.8%	16 %25.40	Number and percentage of reduced items	
	20 %31.25	43 %68.25	Number and percentage of increased items	
	7 %10.39	4 %63.25	Number and percentage of items unchanged	
0.0001	-3.71	14.99	Average	Percentage change in stress management score
	16.28	24.35	Standard deviation	
	-5.13	13.64	mean	
	-53.85	-29.41	minimum	
	35.71	88.89	maximum	
	0.023	0.0001		P

Flowchart Research Method



Discussion

The aim of this study was to determine the effect of educational intervention based on Precede-Proceed model on stress management in high school girls in Rasht City in 2016-2017. The results indicated a significant increase in the mean and median score of predisposing factors (knowledge and attitude), behavior and stress management in the intervention group after intervention compared to the control group. In terms of predisposing factors, these findings are consistent with other studies such as [28], [25], [29], [30], [31], [32]; All of them affect the positive and significant effect of PRECEDE model on increasing the mean of knowledge and attitude. In this study, the control group also had a significant increase in mean of knowledge before intervention. It is believed that providing a questionnaire to the control group somewhat creates the motivation and stimulated curiosity in them and encourage them to find answers to the questions they did not know and eventually lead to a significant increase in awareness in the control group but the increase in the intervention group was significantly higher than the control group ($P < 0.05$).

On the other hand, the study done by [33] is not in line with the current research. Since the attitudes are acquired not learned, and attitudes hardly change, it should be important for the childhood and adolescence when attitudes are developing [34].

On the other hand, the findings of the study done by [35], showed that there was no significant difference in attitude after educational intervention in intervention group ($P < 0.05$); the researchers attributed this to the completion of the questionnaire by the control group in the presence of the researcher, which increased the attitude of the control group.

In the intervention group after the educational intervention, the mean of behavior was significantly higher than the control group, which indicates the effect of behavioral instruction in practice. This finding is consistent with other studies such as the ones done by [36], [37], [38], [39], [40]. On the other hand, it is not consistent with the study done by [41]. There may be different results due to the lack of use of health education model and cultural differences and different methods of teaching with the present study. Since having knowledge does not guarantee the behavior, there is a need for knowledge and positive attitudes to improve the performance [42]. The behavior is a multiple-causality factor which cultural, environmental, and economic issues contribute to its formation.

After intervention, stress management score increased significantly in the intervention group. However, before the educational intervention, some of the demographic variables such as father's occupation, mother's education, mother's occupation and family income were significantly higher than the intervention group, behavior and management had lower stress that seems high expectations of educated parents than their children regarding educational achievement and less emotional support of working mothers from their children due to the shorter time available for them to work maybe can

justify this. It decreased significantly in the control group may be due to coincidence with the student's monthly exams that led to increasing stress in students. The stress management significantly increased in intervention group due to the acquisition of the necessary skills for educational intervention based on PRECEDE model. But in the control group, stress management was significantly decreased and the change in the stress management score in the intervention group was significant. The result was consistent with the findings of the studies done by [43], [27], [44] and [45]. But it was not consistent with the result of the study done by [46]. According to the researcher, the diversity of training items and the limited time devoted to stress management have led to this conclusion.

The study by [47] showed that the educational intervention did not significantly affect the anxiety of intervention group because only an effective emotional technique has been used for the stress management and there is a need for an underlying strategy to deal with stress.

Stress management changes did not a statistically significant relationship with demographic factors which is consistent with the studies done by [48], [49].

It is not consistent with the study done by [20] and [50], due to the cultural changes. The most important variable that influences stress management is educational intervention, which is consistent with the study of [6], [45].

One of the limitations of this study was using a questionnaire and self-reporting to measure behavior that did not have a direct observation of behavior and differences in personality traits of individuals and some inner excitements of the samples when completing a questionnaire that was effective in responding to the questionnaire.

Conclusion

Considering the effect of educational intervention based on Precede-Proceed model on stress management of students and correlation of stress management with behavior, it can be concluded that the items such as the including topics related to stress management and life skills training in student textbooks and distribution of educational packages such as the training pamphlet in the case of stress management for parents and staff as reinforcements can play the important role in mental health promotion.

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