

The effect of positive achievement emotion training on academic motivation and academic boredom in students of Dezful university of medical sciences

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ABSTRACT

Cognitive, motivational, and emotional factors are the most important and effective factors of the students' performance and academic lives. The role of achievement emotions related to cognitive and motivational factors is very important. According to the control value theory of achievement emotions, emotions can affect the cognitive and motivational resources, use of strategies, self-regulation, and as a result, academic improvement also can be affected by them. This study was conducted to investigate the effect of training positive achievement emotions on academic motivation and academic boredom in students of Dezful, University of Medical Sciences. The method was experimental with pretest, posttest design, and with a control group. The statistical population included all of the bachelor students of the mentioned university, including 478 people, 54 of whom were selected by multi-stage random sampling and were randomly put into experimental and control groups. The experimental group was trained in positive emotions training techniques (based on the positive achievement emotions training package) for ten 2-hours sessions. In this study, we used the academic motivation scale of Vallerand, and the academic burnout questionnaire of Berso, Salanova, and the statistical data were analyzed by descriptive statistics and analysis of covariance.

The findings of the intervention in the study showed that there is a significant difference between the means of the experimental and control group in the variable of academic motivation: ($p \leq 0.001$) and academic exhaustion: ($p \leq 0.001$). The results showed that training positive achievement emotions has led to a significant increase in academic motivation and a decrease in academic exhaustion in the experimental group. These results have important implications about the importance of training positive achievement emotions and the good management of them for medical students and also can be used as a framework for modifying and regulating students' emotions and improving their academic performance in universities of our country by professors and academic policymakers.

Keywords: Academic emotion regulation, Control value theory of achievement emotions, Academic motivation, Academic boredom, Medical education

Introduction

Among the most important and influential factors regarding the students' academic performance, we can refer to the cognitive, motivational, and emotional factors. Therefore, the combination of these factors and their interaction with each other will play an important role in predicting and improving learners' academic performance and abilities. In the meantime, the role of emotions of progress concerning cognitive and motivational factors is important. Emotions in an interactive cycle, on the one hand, affect these factors and on the other

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hand, are affected by them. The interaction of emotions with other educational components has been confirmed in many types of research. According to the predictions of the theory of control-value of the emotions of progress, the emotions affect cognitive resources, motivation, use of strategies, self-regulation, and consequently academic achievement, and are affected by them [1]. On the other hand, managing and regulating the emotions of progress, especially positive emotions, has a great effect on the academic performance of learners and is an important factor on which effective learning and adaptation in the classroom depend.

The construct of academic motivation in school refers to behaviors that are related to learning and progress; it is more related to the dimension of motivation called intrinsic motivation (doing an activity because of its pleasurable nature) [2]. Academic motivation refers to behaviors that lead to learning and progress. Academic motivation is an internal process that stimulates activities and continues with the goal of achieving specific academic achievements [3]. Intrinsic motivation, on the other hand, refers to the kind of motivation that motivates people to move spontaneously and internally to perform a particular task. Apart from the external rewards of doing one's task, it is valuable and satisfying for the individual. But external motivation refers to a motivation that forces people to do the task because of external rewards and reinforcements. External motivation is when people are externally aroused and work to achieve something more than their pleasure. Finally, unmotivated people are people who do not receive any motivation, i.e. neither inner satisfaction and value nor external incentives for their activities, and consequently avoid doing the activity [4]. One of the assumptions of a value-control theory is that emotions affect academic motivation. Pleasure, hope, and pride (positive activating emotions) are positively related to intrinsic motivation, extrinsic motivation, and self-reported effort [5].

Fatigue is also a specific emotional experience that consists of five components: emotional (feeling uncomfortable, feeling sad), cognitive (perceiving changes in time), motivational (tendency to change or quit an activity), physiological (reducing motivation), and expressive (facial, vocal, and local signs). According to this view, fatigue is only the absence of positive emotion or interest [6]. Academic emotions are defined as emotions experienced by individuals in educational settings that are directly related to learning behaviors, classroom activities, and their achievement outcomes [5, 7]. Due to the processing nature of fatigue experiences, academic fatigue is usually experienced in learning activities in educational settings; for example, when completing homework or classroom-based learning exercises. Pekrun *et al.* (2007) [1] showed that pleasure, hope, and pride (positive activating emotions) are negatively related to academic fatigue.

As mentioned, poor emotional self-regulation will cause many educational and training problems for students. From a practical point of view, the necessary bedrock has been considered to pay attention to the prominent role of progress emotions, especially

positive emotions (including hope, pride, and pleasure) in the students' life and academic progress in the educational plans of the Iranian higher education system. Experiencing the emotions of progress and not being able to control and manage them can have many destructive effects on students' academic performance. There is a lot of research on the relationship between these emotions and important academic variables or the effect of managing and regulating them on the important academic variables, including teaching executive functions on negative emotions [8], academic success [9], motivation and learning [10], students' psychological well-being [11], reducing stress, anxiety, and depression [12], academic fatigue [13], academic motivation [14], exam anxiety [15] and so on. It confirms that the use of the "Progress Positive Emotion Regulation Program" can improve the quality of students' academic life. Considering the many searches that the researcher did among the researches done in the field of progress emotions, it was found that all the researches (except in a few cases) in this field are of a relational type or eventually modeling. Therefore, it seems necessary to study the effect of positive emotion training on the motivational variables. (Educational-intervention Package of positive emotions of progress) the present research is based on the emotional regulation approaches of Pekrun *et al.* (2014) [16]; it includes the principles and approaches of positive emotion regulation including hope, pride, and pleasure. The question that arises is "What effect does the positive emotion regulation training have on important variables such as academic motivation, and academic fatigue in medical students?"

Procedure

The present research is a field experiment and its design is pretest-posttest with a control group. In this design, there is an experimental group and a control group. Before training the positive emotions of progress, we pretested both groups in the variables of academic motivation and academic fatigue. Then, we trained the experimental group in positive emotions and we did not give any training to the control group. At the end of the training course, both experimental and control groups were immediately post-tested in research variables by the Walrand Academic Motivation Questionnaire (1992) and the subscale of Bresso and Salanova Academic Fatigue Questionnaire (2007). The statistical population included all MSc students of Dezful University of Medical Sciences who were studying in the academic year 2018-19. Based on the information received from the university education department, the total population under study was about 478 people. To test the research hypotheses, we used the multi-stage random sampling method. Out of 478 students of Dezful University of Medical Sciences, we randomly assigned 54 people to the experimental and control groups (27 in the experimental and 27 in the control group).

Sampling for Testing Research Hypotheses:

The multi-stage random sampling method was appropriate to select the sample for measuring the effect of teaching positive progress emotions on students' academic motivation and academic fatigue. First, two departments were randomly selected from the two existing faculties, which included six departments, and three classes were randomly selected from each department. Then 9 students were selected from each class and a total of 54 people were randomly divided into experimental and control groups. Thus, 27 students were placed in the experimental group and 27 students in the control group.

Based on the theory of control-value of emotions of progress [1], the techniques for promoting positive emotions of progress were taught to the experimental group in 10 two-hour sessions. The training materials included books, articles, worksheets, slides, and whiteboards. Each training session had 4 stages. In the first stage, the subjects were prepared. In the second stage, the main training was given. In the third stage, the subjects thought about what they were taught. In the fourth stage, the activities were reviewed and completed by the subjects and the examiner and they were given homework. Moreover, after the first session, in the preparation stage of the next session, the homework of the previous session of the students was discussed. The training steps were as follows:

	Title	Training Techniques
1	Pre-test, introduction, and rules	Performing pretests, introducing members, introducing procedure, and teaching rules
Second, third and fourth sessions	Teaching the dimensions of the emotion of hope Three sessions	Training of Goal Thinking: Identifying the goal and ways to choose positive goals
		Training of Path Thinking: Identifying the paths of thinking to reach the goal and teaching the choice of the right path to reach the goal, recognizing the obstacles in the path of achieving goals, and presenting a list of current events and important aspects of life
		Training of Agent Thinking: Introducing the component of hope agency to students and increasing their motivation in the component of hope agency, creating hope and teaching hope in real life; in this session, the goal is to maintain and preserve hope in students.
Fifth and sixth sessions	Teaching the dimensions of the emotion of pleasure	Teaching concentration strategies to students on successful academic experiences and writing them Teaching effective strategies for achieving academic success Identifying valuable goals for students and increasing their motivation to achieve these goals

Seventh, eighth, and ninth sessions	Teaching the dimensions of the emotion of pride	Teaching positive emotions identification Teaching students to find categories that are of interest to them and that they are interested in. Teaching the use of feedback loops (mutual causation) to promote students' sense of enjoyment in learning Teaching motivational components of interest-pleasure: work orientation, mastery goals, and intrinsic value
		Teaching: Emotional self-awareness-Dominant self-attribution and behaviors based on successful efforts and strategies and expectations of the highest performance in the future, having a positive self-assessment and focusing on goals and how to set goals correctly and redefine goals and success process, teaching strategies to build and promote self-confidence, the difference between true pride and arrogance
		Teaching: Strategies for strengthening personal responsibilities in self-assessments, focusing on behaviors that lead to success, motivational strategies to achieve success, critical thinking and problem-solving skills, strategies to deal with shame and overcome them using self-reconstruction
Tenth session	Performing post-tests	Using teachers' feedback, teaching the use of the effort-strategy-endurance process in achieving goals, using the techniques of relief and anxiety and relaxation In this session, post-tests were performed and students' participation was thanked.

Research Tools

In the present research, the following tools were used to collect data:

1. Walrand Academic Motivation Scale
2. Bresso and Salanova Academic Burnout Questionnaire (Academic Fatigue Sub-scale)

Walrand Academic Motivation Scale: In this research, the questionnaire of Walrand *et al.* (1992) is used to measure students' academic motivation. This scale has 28 seven-option questions that measure the three dimensions of intrinsic motivation, extrinsic motivation, and non-motivation. The Walrand Academic Motivation Scale includes three subscales of Internal Motivation (12 questions), External Motivation (12 questions), and Non-Motivation (4 questions), which has a total

of 28 questions. The scoring scale of this questionnaire is a 7-point scale. Option 1 indicates that the relevant expression (question) does not correspond at all to the student's reason for going to university. Options 2 to 6 show a slight to a high agreement and option 7 shows a complete agreement with the student's view. Thus, the score of 4 is moderate. The highest and lowest scores for each person are 196 and 28, respectively.

Reliability of the Walrand Academic Motivation Scale: This scale includes seven subscales of intrinsic motivation, extrinsic motivation, and non-motivation, which has a total of 28 questions. Walrand et al. (1992) reported the reliability of these subscales using Cronbach's alpha method by 0.84, 0.85, 0.86, 0.62, 0.84, 0.85, and the total reliability by 0.71, respectively. Bahrani (1993) also evaluated the reliability of the questionnaire by retesting method and obtained a coefficient of 0.73 in a retest two weeks apart. In addition, Visani, Lavasani, and Ejei (2012) reported Cronbach's alpha for the subscales of intrinsic motivation, extrinsic motivation, and non-motivation, respectively, by 0.84, 0.86, and 0.67.

The validity of the Walrand Academic Motivation Scale: Studies conducted by Walland et al. (1992) show that the validity of the English Sample of Academic Motivation Scale (AMS) on the high school students as well as Canadian students was confirmed by analyzing heuristic factors. Only Rashvandloo and Hejazi (2009) in Iran have evaluated the validity of this questionnaire as good. Besides, Kavousian, Kadivar, Shahrarai, Sheikh Fini, and Farzad (2009) have also evaluated its validity positively. In this research, Cronbach's alpha and split-half were used to confirm the reliability of this tool. Reliability obtained by Cronbach's alpha was equal to 0.914 and by split-half method equal to 0.911.

Academic Burnout Questionnaire: This scale was developed by Bresso et al. (2007). This questionnaire measures three areas of academic burnout: academic fatigue, academic apathy, and academic inefficiency. The questionnaire has 15 items that have been graded with the 5-point Likert from I completely disagree to I agree. Academic fatigue has 5 questions. According to the research title, we analyzed only the scale of academic fatigue of this questionnaire.

Reliability of the academic burnout questionnaire: The reliability of the academic burnout questionnaire was calculated by its creators as to be 0.70, 0.82, and 0.75, respectively, for three areas of academic burnout. Azizi (2010) calculated the reliability of this questionnaire using Cronbach's alpha method for academic fatigue by 0.77, academic apathy by 0.82, and academic inefficiency by 0.66, and the total burnout questionnaire by 0.85.

The validity of the Academic Burnout Questionnaire: The validity of this questionnaire was calculated by Bresso et al. (1997) using the confirmatory factor analysis method; they reported that the adaptability fit index, incremental fit index, and the root mean square of the approximation error squares were desirable. Naami (2009) obtained the validity coefficients of this questionnaire by correlating it with the Student Stress Questionnaire. For the three domains, they obtained 0.38,

0.42, and 0.45, respectively, which was significant at the level of $P \leq 0.001$. In this research, Cronbach's alpha and split-half methods were used to confirm the reliability of this tool. Reliability obtained by Cronbach's alpha method was equal to 0.845 and by split-half method equal to 0.819.

Descriptive Findings

Descriptive findings of this research include some statistical indicators such as mean, standard deviation, and a number of sample subjects as well as frequency and percentage table (see **Table 1**).

Table 1. Central Indicators and Dispersion of Positive Emotion Progress Scores on Academic Motivation and Academic Fatigue of Dezfoul Medical Students in the Experimental and Control Groups

Group	Number	Pretest		Posttest	
		Mean	Standard Deviation	Mean	Standard Deviation
Motivation in Experimental Group	27	140.03	14.67	162.81	14.15
Motivation in Control Group	27	139.96	15.99	140.22	14.77
Fatigue in Experimental Group	27	15.00	3.36	11.37	2.20
Fatigue in Control Group	27	14.51	4.67	14.07	2.58

Confirmation of Covariance Analysis Presuppositions

To confirm the presuppositions of analysis of covariance in this research, we used Levin, Kolmogorov-Smirnov, and independent t-tests. First, the Kolmogorov-Smirnov test was used to confirm the presupposition of normality of the data. The test result was not significant for all research variables at the level of 0.05, so the presupposition of normality of the data was confirmed. Levin test was also used to confirm the homogeneity of variances. The results of this test were not significant for all variables at the level of 0.05; therefore, due to the non-rejection of the null hypothesis and the non-significance of the presupposed Levin test, the equality of variances of the scores of the two control and experimental groups was confirmed. M BOX test was also used to confirm the presupposition of homogeneity of covariance in this research; considering that $P = 0.93$ was obtained, the homogeneity of covariance was confirmed. On the other hand, to confirm the assumption of uniformity between the two groups in the pretest, an independent t-test was performed. The result was not significant at the level of 0.05, so the assumption of uniformity between the two groups was confirmed; it was found that the scores of the effect of teaching positive emotions of progress on the academic motivation and academic fatigue among Dezfoul medical students in the control and experimental groups have equal variances. Therefore, the analysis of covariance is allowed to test research hypotheses.

Table 2. Results of MANCOVA Multivariate Analysis of Covariance on the Scores of the Effect of Teaching Positive Emotions of Progress on the Academic Motivation and Academic Fatigue among Dezful Medical Students in Two Groups of Control and Experimental

Name of Test	Value	F-test	Degree of Freedom for Hypothesis	Degree of Freedom for Error	Significance Level	Eta ²	Test Power
Pillai's Trace	.6530	**29.465	3.000	47.000	.0010	.6530	1.000
Wilks' Lambda Test	.3470	**29.465	3.000	47.000	.0010	.6530	1.000
Hotelling's Trace	1.881	**29.465	3.000	47.000	.0010	.6530	1.000
Largest Root Test on	1.881	**29.465	3.000	47.000	.0010	.6530	1.000

**Significance Level at the Level of 0.01 * Significance Level at the Level of 0.05

As can be seen in **Table 2**, all tests are significant at the level of 0.05. It indicates that the mean of tests in terms of at least one of the scores of training positive emotions of progress on the academic motivation and academic fatigue in medical students in Dezful has a significant difference between the control and experimental groups.

It is noteworthy that the Wilk's Lambda test with a value of 0.347 and $F = 294.44$ test showed a significant difference between the scores of training positive emotions of progress on the academic motivation and academic fatigue in Dezful medical students between the two groups of control and experimental in the level of significance of 0.05. Therefore, the main hypothesis of the research is confirmed.

Table 3. Results of Univariate Analysis of Covariance (ANCOVA in MANCOVA text) on the Scores of the Effect of Training Positive Emotions of Progress on the Academic Motivation and Academic Fatigue in Dezful Medical Students in Two Groups of Control and Experimental

		Total Squares	Degree of Freedom	Mean Squares	F-test	Significance Level	Eta ²	Test Power
Academic Motivation	Regression Slope Homogeneity	614.917	2	307.459	2.102	.1340	.0820	.4100
	Pre-test Effect	3513.379	1	3513.379	**24.335	.0010	.3320	.9980
	Intragroup	6772.212	1	6772.212	**46.907	.0010	.4890	1.000
Academic Fatigue	Regression Slope Homogeneity	11.515	2	5.758	1.086	.3460	.0440	.2290
	Pre-test Effect	41.189	1	41.189	**7.797	.0070	.1370	.7810
	Intragroup	105.850	1	105.850	**20.037	.0010	.2900	.9920

**Significance at the Level of 0.01 * Significance at the Level of 0.05

The results of **Table 3** show that there is a significant difference between the mean scores of students after teaching positive emotions of progress on the academic motivation and academic fatigue of Dezful medical students in the post-test of the two groups at the level of $p < 0.05$ ($F = 46.97$ for the academic motivation and $F = 20.37$ for the academic fatigue). This difference is in favor of the experimental group in increasing academic motivation and reducing academic fatigue in students. Observation of the third-row data of **Table 3**, which is related to the study of the research hypothesis and the comparison between groups in the post-test of academic motivation, shows that by controlling the pretest in the posttest stage, the square of ETA has reached 0.489. In other words, by removing the effect of pretest from the posttest scores, about 49% of the individual differences in the posttest of academic motivation are related to the effect of using the teaching of the positive emotions of progress (employment and the effect of the independent variable) and the difference between them. Moreover, observing the data in **Table 3** with the academic fatigue shows that, when the effect of pretest difference is removed, we will see a significant difference in the students'

posttest scores. In other words, there is a significant difference between the mean scores of students' academic fatigue after teaching positive emotions of progress. This difference is in favor of the experimental group in reducing the academic fatigue score of Dezful medical students after teaching positive emotions (post-test stage $F = 20.037$ and significance level ($p < 0.05$)).

Observation of the third-row data of **Table 3**, which is related to the study of the research hypothesis and the comparison between groups in the posttest, shows that by controlling the pretest in the posttest stage, the square of ETA has reached 0.290. In other words, by removing the effect of pretest from the posttest scores, 29% of the individual differences in posttest are related to the effect of training positive emotions of progress (employment and the effect of the independent variable) and the difference between them. To study the effect of teaching the techniques of the positive emotion of progress on the dimensions of academic motivation, we used ANCOVA univariate analysis of covariance in MANCOVA text. The results have been given in **Table 4**:

Table 4. Results of Univariate Analysis of Covariance (ANCOVA in MANCOVA Text) on the Scores of the Effect of Training Positive Emotions of Progress on the Dimensions of Academic Motivation in Medical Students in Dezful in Two Control and Experimental Groups

		Total Squares	Degree of Freedom	Mean Squares	F-test	Significance Level	Eta ²	Test Power
Intrinsic Motivation	Regression Slope Homogeneity	113.112	2	56.556	2.248	.1170	.0870	.4350
	Pretest Effect	1366.233	1	1366.233	**54.915	0.001	.5280	1.000
	Intragroup	1014.980	1	1014.980	**40.796	0.001	.4540	1.000
External Motivation	Regression Slope Homogeneity	358.943	2	179.471	2.788	.0720	.1060	.5230
	Pretest Effect	1491.043	1	1491.043	**23.301	0.001	.3220	.9970
	Intragroup	2291.688	1	2291.688	**35.813	0.001	.4220	1.000
Non-motivation	Regression Slope Homogeneity	15.178	2	7.589	.4960	.6120	.0210	.1270
	Pretest Effect	10.907	1	10.907	.7280	.3980	.0150	.1330
	Intragroup	8.350	1	8.350	.5570	.4590	.0110	.1130

**Significance at the Level of 0.01 * Significance at the Level of 0.05

As can be seen in **Table 4**, the value of F of the effect of teaching positive emotions of progress on the internal academic motivation of Dezful medical students in the two control and experimental groups in the posttest is significantly different (value of $F = 40.796$) (significant level $p < 0.05$). This difference is in favor of the experimental group. Observation of the third-row data of **Table 4**, which is related to the study of the research hypothesis and the comparison between groups in the posttest, shows that by controlling the pretest in the posttest stage, the square of ETA has reached 0.454. In other words, by removing the effect of pretest from the posttest scores, more than 45% of individual differences in posttest are related to the effect of training positive emotion of progress (use and effect of independent variable) and the difference between them. Meanwhile, in the second part of the above Table, as can be seen, when the effect of the pretest difference is removed, a significant difference is seen in the posttest of the two groups. The value of F with the pretest control is equal to 35.813 which is statistically significant at the level of 0.05. In other words, there is a significant difference between the mean scores of the effect of training the positive emotions of progress on the external academic motivation of Dezful medical students in the posttest of the control group (55.25) and the posttest of the experimental group (68.40). This difference is in favor of the experimental group in increasing the external academic motivation score of Dezful medical students after teaching positive emotions of progress (post-test stage $F = 35.813$ and significance level $p < 0.05$).

Observation of the data of the third row of **Table 4**, which is related to the comparison between the groups in the posttest, shows that by controlling the pretest in the posttest stage, the square of ETA has reached 0.422. In other words, by removing the effect of pretest from the posttest scores, 42% of individual differences in posttest are related to the effect of training positive emotion of progress (using and the effect of the independent variable) and the difference between them. That is, the use of training positive emotions of progress on the effect of training positive emotions of progress on the external academic motivation of Dezful medical students has been great compared to the control group.

As can be seen in **Table 4**, the value of F of the effect of teaching positive emotions of progress on the academic lack of motivation of Dezful medical students in the control and experimental groups, after removing the posttest effect, does not show a significant difference. In other words, there is no significant difference between the mean scores of training positive emotions of progress on the academic lack of motivation of Dezful medical students in the posttest of the control and experimental groups. That is, the use of training the positive emotions of progress has not had a significant effect on the academic motivation of Dezful medical students (Posttest stage $F = 0.555$ and significance level $p < 0.05$).

Discussion and Conclusion

Findings of the research showed that teaching intervention techniques to regulate progress emotions based on the theory of control-value of progress emotions caused a significant difference in the variables under study in the experimental group compared to the control group. Teaching these techniques to the medical students in the experimental group showed their effectiveness and teaching these techniques increased the overall score of academic motivation and reduced academic fatigue in students. These findings are in line with the teachings of this theory as well as researches conducted in this field. The results of this research showed that teaching positive emotions of progress including hope, pride, and pleasure increased academic motivation and reduced academic fatigue of medical students. This finding is consistent with the results of Sattari, Naqsh, and Hayat's researches. The results of the analysis of covariance showed that 49% of the variance explained the difference between the experimental and control groups that was related to the variable of academic motivation, i.e. the effect of teaching positive emotions of progress. According to the theory of the control-value of emotions of progress, there is a mutual causality between emotions, precedents, and their effects. Individual precedents, including beliefs and goals of progress, affect emotions by influencing individual evaluations, including controllability and the value of activities. The emotions of

progress are also influenced by cognitive assessment and control [1]. On the other hand, regulating the emotion by creating emotional self-awareness can affect a person's precedents as well as his/her cognitive assessments and the goals of progress. In other words, underlying factors and precedents affect and are influenced by emotions. Therefore, it seems that by regulating emotions, we can change the cognitive assessments, motivations, beliefs and individual values, and the goals of progress. Relying on enjoyable experiences and academic achievements, as well as creating positive hope and thinking emotional self-awareness, and self-control, we can increase academic motivation and reduce academic fatigue in students. Along with these results, we can refer to the results of the research of Pekrun *et al.* (2002). Emotions are always present in academic and clinical settings. These emotions probably affect the motivation to confront the problems and efforts of medical students and even the strategies they use to understand the content and ultimately their academic performance. In this regard, some researchers expect that positive emotions such as pleasure positively affect academic achievement. In contrast, unpleasant and inactive emotions such as fatigue can reduce academic motivation and disturb information processing. The findings of the present research emphasize that the role of emotions has a great impact on the students' academic performance and their continued success during and after graduation. The results of this research show that they can increase academic motivation. The results of the present research are consistent with the researches of Hashemi Chelicheh, Hashemi, and Naghsh (2016) on the relationship between emotions of academic progress and burnout [17], Hayat *et al.* (2017) on the existence of a relationship between positive emotions of students' progress and academic performance [18] and Bardokak's research (2017) that showed a positive and significant relationship between positive emotions of academic progress and success [9]. Tan Joon-Ming also concluded in his research that positive emotions of progress have a positive and direct relationship with academic motivation [10]. This finding is also consistent with the results of our research.

The effect of teaching positive emotions of progress on the dimensions of academic motivation was one of the hypotheses of this research. Academic motivation has three dimensions: internal motivation, external motivation, and lack of motivation [19]. The results showed that positive emotion training increased students' external and internal motivation in the experimental group, but had no effect on students' lack of motivation. This finding is in line with the results of previous researches [10, 14, 20-22]. The construct of academic motivation in school refers to the behaviors that are related to learning and progress and is more related to the dimension of motivation called intrinsic motivation (doing an activity because of its enjoyable nature) [2]. Training of positive emotions of progress showed the effectiveness of this training in increasing internal and external motivation in the experimental group. Because, as previously explained, in the field of medical

education, little attention has been paid to the role of progress emotions, especially positive emotions. But the result indicates that teaching the techniques of positive emotions of progress directly enhances students' positive emotions and by strengthening cognitive evaluations, self-awareness, and self-regulation of emotions, it increases students' academic motivation and changes significantly their average scores. Regarding the ineffectiveness of these techniques on students' lack of motivation, we can say that lack of motivation has a relatively complex structure. Non-motivation is the worst profile of motivation. Because it is a reliable and powerful predictor of poor performance. Non-motivation is also directly related to receiving rewards for activity. Therefore, considering that incentives and rewards were not considered in this research, so in this dimension, the average scores of students did not change significantly. These findings are in line with the results of previous researches [8, 13, 15, 23].

Another hypothesis of this research was to investigate the effect of teaching positive emotions of progress on the academic fatigue of medical students. The results of statistical analysis showed that the mean scores of the experimental group were significantly lower than the control group. This finding indicates the effectiveness of the implementation of teaching the techniques of positive emotions of progress on reducing students' academic fatigue in the experimental group compared to the control group. Due to the processing nature of fatigue experiences, academic fatigue is usually experienced in learning activities in educational settings. Pekrun's value-control approach (2006) explicitly focuses on learning fatigue and success [24]. According to this theory, mental and value control assessments are related to successful activities and in this regard, show two important cases of psychosocial prerequisites of the experience of fatigue (and other academic emotions) [25].

It should be noted that teaching techniques for increasing positive emotions of progress, which has been designed based on Pekrun's control-value theory, through the approach of regulating positive emotions and considering the interaction of emotional precedents and consequences in the framework of mutual causality, increases emotional capacity, empowerment, and self-awareness of the medical students. Promoting positive emotions, while increasing students' self-confidence, strengthens their academic motivation and cognitive assessments, and through improving academic performance, it increases their academic abilities and reliance on academic achievement and reduces their academic fatigue. Teaching these techniques by directly modifying and making efficient the positive academic emotions, using techniques to increase hope, pleasure and real pride (which are directly and positively related to the academic motivation and negatively and inversely to the academic fatigue) and related exercises caused students to focus on the positive emotions and learn how to control their negative emotions. Therefore, we can conclude that managers of educational systems and professors in the field of medical education should pay special attention to the emotions and especially the academic emotions of students in this field and

exploit such emotions to facilitate learning and improve students' academic performance and achievement. Especially the clinical environments in the medical centers are full of emotional crises that, in addition to a direct impact on the mental health and mental well-being of students, also have a significant impact on the health of patients. Medical students need to have the ability to cope with these emotional tensions in terms of emotional control and emotional self-awareness and mental health to be able to provide better and more useful performance. This will be possible with proper attention to cultivating emotional abilities, especially positive emotions, and designing and optimizing environments and techniques for learning and optimizing emotions.

According to the results, we suggest that in line with this research, some longitudinal researches should be conducted so that researchers can examine the effect of teaching positive emotions of progress over a longer period. We also recommend that in future researches, in addition to self-reporting tools, tools such as observation and checklists are used. Because students' placement in experimental conditions may affect the actual results, so for more detailed comparison and review, we recommend that in future researches, some of the assessments be performed in real test conditions. Due to the complexity and multidimensionality of emotions, as well as the two-way effect of emotions and precedents, and academic performance based on the principle of reciprocal causality, we suggest the use of a multidimensional education and assessment model in future researches. It should be noted that the results of this research and similar researches lead the officials of medical universities as the custodians of the field of health to the attention to teaching the positive emotions of progress and the skills of controlling and regulating academic emotions and increasing students' motivational abilities and reducing academic fatigue and test anxiety. In this way, their ability in clinical areas is improved and they can keep the health of individuals at a higher level.

Finally, it should be acknowledged that although the results of the present research confirmed the effect of teaching positive emotions of progress on the academic motivation, test anxiety, and academic fatigue of students, like all researches, this has some of the limitations as following:

Emotions are multidimensional phenomena and are influenced by other variables and affect them. Therefore, measuring the effect of emotions alone, and controlling other moderating variables, is another limitation of this research and all experimental studies. Because one of the data collection tools in this research was the questionnaire with a self-report aspect, the information obtained may be biased or include only part of the students' mental and emotional realities. It should be noted that the results of this research are related to Dezfoul medical students. Therefore, a generalization of these results to the students of other universities, especially non-medical ones, who differ from medical students in terms of academic planning and clinical conditions of the fields should be done with caution.

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