

## Original Article

## Modifying Alexithymia by Implementing Emotional Regulation Skills among Anxious Students

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### Abstract

**Introduction:** The main purpose of this study was modifying anxiety and alexithymia by instructing emotional regulation skills among anxious female students in Tehran.

**Methods:** Quasi-experimental design was applied in this study. Convenient sampling method with 50 volunteer female high school students was utilized. Their scores ranged from 26-36 in Beck anxiety questionnaire and eligible to exclude- include criteria were selected and participants were randomly assigned into two experimental, and control group (each group included 25 subjects).

**Results:** Data analysis and applying ANCOVA methods revealed the instructing emotional regulation skills could significantly decrease anxiety, and alexithymia among subjects in experimental in comparison to subjects in control group ( $P < 0.05$ ).

**Conclusion:** Implementing cognitive and emotional regulation skills such as restructuring of content and process of sabotaging beliefs, modifying negative emotions, using reappraisal, reinterpretation, problem solving, mindfulness techniques, and emotional regulation could reduce anxiety and alexithymia symptoms in anxious students.

**Declaration of Interest:** None.

**Keywords:** Anxiety, Alexithymia, Emotional regulation, Students.

### Introduction

Anxiety is defined as arousing a negative emotional state with a sense of apprehension and the lack of control over perceiving the potential threat of future (1 and 2). It is essential to provide psycho-educational or therapeutic strategies to manage such emotional problem since 31.9 percent of juveniles experience one of the anxiety disorders during their lifetime (3). It has been found that failure to manage negative emotions is one of the factors leading to anxiety disorders (4).

Besides, experiencing and expressing negative emotions has a significant role in anxiety occurrence (5). In other words, the intensity of emotions and applying maladaptive emotional regulatory strategies are good predictors of anxiety (6). In fact, anxiety is one of the emotions which caused by a disturbance in emotional regulation (7, 8 and 9) in a way that facing problems of emotional regulation has a role in development and maintenance of anxiety (5 and 10). On the other hand, anxiety inhibits exaggerated emotional reactivity and reduction in voluntary use of emotional regulation strategies (4).

People afflicted with alexithymia are more prone to anxiety symptoms (11). Alexithymia is one of the indicators of failure to communicate and disturbance in emotional health (12). It is also defined as disability in recognizing and expressing emotions, which clinical features are difficulty in recognizing and describing different emotions, difficulty in making a difference between emotions and physical sensations pertinent to emotional arousal, limitations in mental imagery process that is appeared by the lack of dreaming relevant to cognition style and facing the external environment (13). The most significant symptom of alexithymia is the lack of words for expressing emotions (14). In fact, alexithymia is pointed as a special inquietude of emotional processing, particularly the reduction of ability to express emotions orally and recognizing them, difficulty in perception, processing and interpreting verbal and nonverbal emotional stimuli, difficulties in making a difference between emotions and physical senses stimulated by emotions, cognitive style and thinking oriented to extrinsic stimuli (15 and 16). Tyler (17) has considered the lack of introspection and social conformity and adjustment as the features of alexithymia.

As mentioned above, deficiency in self-regulation abilities is a common feature of both alexithymia (18, 19 and 20) and anxiety (21, 22 and 23). Alexithymia might lead to the confusion of the ability of inner experiences regulation and behavioral manifestation of emotions (24). Chen, Xu, Jing and Chan (25) proposed that people with different levels of alexithymia express different manifestations of anxious and depressive behavior and it is highly probable that they apply destructive emotional regulation solutions to cope with different

situations (25). Therefore, alexithymia plays an important role in regulations of emotions and difficulty in recognizing and describing one's emotional states (alexithymia (26)) is related to non-verbal adaptive emotional processes and weakness in visualization ability (27) in a way that upper levels of alexithymia has a relation with the lack of emotional awareness adjusted with cognitive demands (28 and 29). In fact, awareness and emotional expressions are essential for adaptive emotional self-regulation (30 and 31).

Emotional self-regulation is defined as intrinsic and extrinsic processes responsible for monitoring, evaluating and modifying emotional reactions which in particular are temporary with severe outbreak to let a person achieve their goals (32). Gross (7) has proposed that, there are five strategies related to emotional self-regulation that can be classified into two groups of antecedent-focused strategies (situation selection, situation modification, attention deployment and cognitive change) and response-focused strategy (response modulation). These strategies can act adaptively or non-adaptively and are essential for evaluation of a context (33). Adaptive emotional self-regulation includes selection and applying those regulatory strategies which are appropriate for the context. These strategies are also appropriate for controlling of internal and external events which are adjusted with Individuals' long-term goals (34, 35 and 36). This regulation includes four steps: (1) pausing; (2) noticing; (3) making decisions to how to control emotions and current situation and acting along achieving long-term goals (37).

Some of the emotional self-regulation models emphasize on the importance of implicit (automatic) emotional regulation (38). Implicit processing is pertinent to process relevant to unconscious learning or memory and can be conceptualized as a secondary level of emotion regulation (39) that is probably the result of the effective practice and acquiring skills (40). Alexithymia can be relevant to emotional self-regulation and also influence emotional self-regulation (41).

Therefore, with considering the significant prevalence of anxiety among students (42, 43, 44 and 45) and its destructive role in their psychological health and educational performances (18 and 46) and also by taking the relationship between anxiety and alexithymia with difficulties into account, this study makes an effort to investigate the effectiveness of instructing the emotional self-regulation skills on reducing alexithymia and anxiety of anxious students.

### **Methods**

The statistical population of the present study included all high school female students of Tehran in the first semester of

1393-1394 academic years. At first convenience sampling method were employed, after having an announcement on all female high schools of Tehran announcement boards. Out of 652 participants whose scores of Beck anxiety inventory (47) were in the range of 26- 36, 50 were selected based on DSM-5 criteria, after having a clinical interview with considering the inclusion criteria (age range of 14- 17, single, lack of physical disabilities, lack of hormonal disorders, lack of any other psychological disorder). Then after filling out the written testimonial of taking part in the research, participants were randomly assigned into two experimental and control groups. The participants of both groups filled out all Beck anxiety (47) and Toronto alexithymia (48) inventories questions before and after assigning into control group. In this research, emotional self-regulation skills were instructed to anxious students in a workshop based on the presented intervention protocol by Gross (49) in 12 weekly sessions (each session 60 minutes). The contents of educational sessions are briefly presented in table 1.

Table 1: emotion regulation skills teaching protocol (49)

Session	Objective	Explanation
<b>1<sup>st</sup> session</b>	-administrating pretest -starting communication and introducing the course	- defining emotion and emotion self-regulation - conceptualizing the problem
<b>2<sup>nd</sup> session</b>	teaching emotional self-regulation and commencing relaxation practice	-introducing and teaching the logic of therapy and principles of development-progressive muscular relaxation -introducing the aspects of emotion self-regulation -introducing the emotional arousal situations
<b>3<sup>rd</sup> session</b>	Relaxation and problem- solving	-defining and introducing problem-solving methods -teaching development-progressive muscular relaxation 16 groups
<b>4<sup>th</sup> session</b>	Problem-solving, reappraisal and	-defining reappraisal and its kinds

	mindfulness	
<b>5<sup>th</sup> session</b>	Defining cognition and thinking, emotion-oriented reappraisal and relaxation	-defining mindfulness and methods of achieving it -problem-solving practice -introducing the interaction between thoughts, emotions and actions -emotion-oriented reappraisal and its kinds - teaching development-progressive muscular relaxation 7 groups
<b>6<sup>th</sup> session</b>	-solving paradoxes, mindfulness and problem-solving	-practice based on ABC model -continuing mindfulness practice (tiger metaphor) -continuing problem-solving practice ( paradox-solving method)
<b>7<sup>th</sup> session</b>	-introducing automatic thoughts, problem-oriented and relaxation	-introducing automatic thoughts - problem-oriented reappraisal -continuing problem-solving practice.
<b>8<sup>th</sup> session</b>	-the seven-level Beck model, mindfulness and temper regulation	- discussing about the automatic thoughts and their opposite thoughts -continuing the mindfulness practice by attention-drawback method - defining learnt miserable -teaching temper regulation
<b>9<sup>th</sup> session</b>	Reappraisal and relaxation	-practicing the seven-level Beck model to answer illogical thoughts and controlling negative emotions -practicing reappraisal - teaching development-progressive muscular relaxation solo group
<b>10<sup>th</sup> session</b>	Increasing emotional awareness and relaxation	-continuing the seven-level Beck model practice -problem-solving practice -practicing emotional scenarios -teaching expansion and relaxation
<b>11<sup>th</sup> session</b>	Adjustment, sympathy and self-regulation	-learning adjustment -controlling adjustment -introducing sympathy and empathy and difference between them -teaching self-regulation
<b>12<sup>th</sup> session</b>	-Concluding training sessions -administrating post-test	

In data analysis step both ANCOVA and MANCOVA tests were applied after studying the hypothesis such as normal distribution of scores, variance homogeneity of scores of the groups, homogeneity of variance and covariance matrixes, homogeneity of regression slopes and linear relationship between random covariates and ANCOVA and MANCOVA.

### Results

In general 50 subjects were participated in this study, (25 participants in experimental group and 25 participants in control group) with mean age of 15.86 and standard deviation of 1.24 of year and all participants were female high school students. The mean and standard deviation of both groups scores of studied variables are presented in Table 2 based on the situation.

**Table 2:** descriptive features of anxiety scores and alexithymia based on group and situation

Variable	Situation	Group	mean	SD
Anxiety	Pretest	Experimental	33.68	5.29
		Control	32.64	4.40
	Posttest	Experimental	13.12	4.87
		Control	34.64	4.23
Alexithymia	Pretest	Experimental	46.44	8.55
		Control	44.40	8.07
	Posttest	Experimental	37.16	9.59
		Control	44.08	9.76
Difficulty identifying feelings (DIF)	Pretest	Experimental	16.00	5.24
		Control	15.28	5.31
	Posttest	Experimental	11.24	4.68
		Control	15.20	5.97
Difficulty describing feelings (DDF)	Pretest	Experimental	11.92	3.58
		Control	11.72	3.66
	Posttest	Experimental	11.32	3.83
		Control	11.72	3.54
Externally oriented thinking (EOT)	Pretest	Experimental	18.52	4.05
		Control	17.40	4.05
	Posttest	Experimental	14.60	4.44
		Control	17.16	4.56

The results of ANCOVA test are presented in table 3. in order to study the fluctuation of anxiety scores in both groups. As it can be seen the results show that there is a significant relationship between scores of experimental group and control group by

eliminating the pretest effects ( $p < 0.05$ ). It means the instructing emotion self-regulation skills have dramatically decreased the students' anxiety of experimental group in comparison with control group ( $\eta^2 = 0.78$ ).

**Table3:** Analysis of ANCOVA to study the differences between the anxiety scores fluctuations of two groups

Source	SS	df	MS	F	P	$\eta^2$
Group	5780.286	1	5780.286	168.625	0.0001	0.782
Error	1611.111	47	34.279			
Total	35920.00	50				

The results of ANCOVA test is presented in table 4. to study the alexithymia scores fluctuation of both groups. As it can be seen the results showed that the difference

between both control and experimental group scores fluctuation is significant ( $p < 0.05$ ). It means the instructing emotion self-regulation skills are resulted to the

reduction of students' alexithymia ( $\eta^2= 0.17$ ).

Table 4: Analysis of ANCOVA to study the differences between the alexithymia scores fluctuations of two groups

Source	SS	df	MS	F	P	$\eta^2$
Group	767.310	1	767.310	9.645	0.003	0.170
Error	3739.254	47	79.559			
Total	87597.000	50				

The results of MANCOVA test is presented in table 5 to study the meaningful relationship between the differences of alexithymia scores fluctuation of both groups in alexithymia subscales. As it can be seen the results show the meaningfulness of the difference between mix variables in two groups ( $p<0.05$ ).

Table 5: Pillay test to study the interaction difference of alexithymia subscales in two groups

value	F	df1	df2	P	$\eta^2$
0.192	3.411	3	43	0.026	0.192

The results of ANACOVA are presented in table 6 in order to study alexithymia subscales one by one. As it is clear, the results showed the difference between two subscales of DIF and EOT of groups, is meaningful by eliminating the pretest effect ( $p<0.05$ ). It means the instructing emotion self-regulation skills resulted to the reduction of DIF and EOP, but in difficulty subscale dealing with expressing emotions, the difference is not statistically meaningful despite the mean reduction of control group scores in posttest compared to pretest (0.6

score) and consistency of the mean scores of control group in this subscale.

variable	SS	df1	df2	MS	F	P	$\eta^2$
DIF	206.099	1	45	206.099	7.008	0.011	0.135
DDF	2.969	1	45	2.969	1.991	0.165	0.042
EOT	107.200	1	45	107.200	5.621	0.022	0.111

### Discussion and conclusion

According to the findings of this research instructing adaptive emotional self-regulation skills can decrease the anxiety symptoms among students (4, 5 and 51). These findings are consistent with other previous findings regarding the effectiveness of applying effective strategies of emotional self-regulation (including conscious attention and findings development and implicit reappraisal) on anxious people's experienced emotional pressures reduction. In addition, it was showed the instructing emotion self-regulation skills result to anxiety symptoms reduction and increasing mental health (52). As it was mentioned in introduction part, deficiency in emotion self-regulation leads to anxiety (21, 22 and 23). Therefore, sorting out this deficiency can

lead to decreasing the anxiety symptoms by instructing emotional self-regulation skills. On the other hand, applying some non-adaptive emotion regulation solutions such as inhibition and avoiding emotional abnormalities like anxiety have been observed (53, 54 and 55), however, reappraisal is relevant to high degrees of positive feelings and low levels of negative feelings (like anxiety and depression) as an adaptive solution (56). The lack of problem-solving skill has also relation with people's tendency to depression and anxiety (57, 58). In addition, there is a positive correlation between mindfulness and emotional self-regulation at the time of controlling anxiety and depression symptoms (59). Hence, with considering this point that there have been some skills instructed in this research such as; mindfulness practice, accepting emotions and decreasing inhibition, reappraisal, decreasing emotional inhibition and problem-solving skills as solutions in the area of emotion self-regulation, therefore decreasing the anxiety symptoms is explicable by this present interference. Besides, decreasing anxiety can be observed by applying behavioral- cognitive techniques accompanied with training packages of relaxation skills (60). Instructing emotion self-regulation skills led to the reduction of alexithymia and DIF and EOT subscales in this research, however, this finding is consistent with Kennedy and Franklin (61) study's, findings based on the effectiveness of instructing skills relevant to clarity, identification and description of feelings and emotions on decreasing alexithymia features of anxious people. Deficiency in emotional self-regulation

skills and applying more non-adaptive emotional self-regulation (such as prevention, suppression and weakness in reappraisal) are introduced as the features of those afflicted with alexithymia in this research (19, 20, 62, 63 and 64). Therefore, it can be expected that instructing emotional self-regulation skills will lead to decrease in alexithymia features by modifying such deficiency and increasing applying adaptive emotional self-regulation skills such as; decreasing inhibition and increasing awareness and acceptance, increasing problem-solving skills and reappraisal. The people who are afflicted with alexithymia have difficulties with identifying emotions and prefer focusing on external events to focus on extrinsic status (65) and they also lack emotions in the area of conscious awareness (66 and 67) which are essential for successful emotion self-regulation ability and cognitive awareness of emotions (68 and 69). Tyler (70) believes the deficiency in cognitive processing of emotional data results to deficiency in emotional self-regulation ability of alexithymia. Therefore, it can be concluded from these information that instructing emotional self-regulation skills by increasing the individual awareness of emotions will probably result to increase their ability of identifying positive and negative emotions, increasing information processing and emotion regulation skills by increasing consciousness of emotions, increasing pay attention to intrinsic status than external events and increasing cognitive processing ability of emotional information, decreasing alexithymia features such as decreasing the difficulty of identifying feelings and externally- oriented

thinking. We can point out the limited period of training course, focusing the most of training protocol on increasing awareness, identifying emotions and ways of thinking and the lack of time for practicing skills more to justify the meaninglessness of the finding “the reduction of subscale scores of difficulty to express feelings”.

In addition, in most of the studies there is a meaningful relationship between alexithymia and anxiety features (11, 71, 72, and 73). On the other hand, researchers like Hintikka and et al. (74) and Honkalampi and et al. (75) have introduced alexithymia as a process dependent on the situation which is the result of psychological distress like anxiety. In such perspective alexithymia is considered as a supportive mechanism against emotional inquietude related to the situation. Therefore, with considering such relation it seems the instructing emotional self-regulation skills can have an indirect effect on decreasing alexithymia by decreasing anxiety (finding related to the first hypothesis).

In a general explanation for the findings of this research can be said that instructing emotional self-regulation skills based on the presented protocol by Gross (4) result to the reduction of anxiety and alexithymia among anxious students by components such as increasing the awareness of emotions, increasing mindfulness and emotional acceptance, decreasing inhibition and increasing reappraisal, problem-solving and thinking skills by increasing awareness of emotions and paying more attention to intrinsic status and the ability of emotional information processing.

Performing this research on only female high school students of Tehran can be pointed as one of the limitations of this research. Therefore, the results should be cautiously generalized. It is suggested to perform this research on males and other age groups in different cities of Iran in order to increase the capability of generalizing the results.

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