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# The Effectiveness of Emotion Regulation Skills Training on Reducing Anxiety Disorders in Surgical Patients

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## Abstract

**Objective:** This study aimed to investigate the effectiveness of emotion regulation skills training on reducing anxiety disorders in surgical patients.
**Method:** The research sample comprised 30 individuals (15 patients in the experimental group, 15 patients in the control group) selected from patients undergoing surgery in Tehran. Participants were recruited through convenience and voluntary sampling. The study employed a pretest–posttest design with an equivalent control group. The research instrument was the Depression Anxiety Stress Scales (DASS) developed by Lovibond and Lovibond (1995). Data were analyzed using analysis of covariance (ANCOVA).
**Results:** Findings indicated that emotion regulation skills training significantly improved depression control, anxiety control, and stress management in surgical patients of the experimental group compared to the control group.
**Conclusion:** These findings suggest that healthcare systems and surgical medical teams should pay particular attention to delivering emotion regulation skills training to their patients in order to achieve better clinical outcomes and provide comprehensive support for patients' mental health.

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## Introduction

Surgery is recognized as one of the most complex and stressful therapeutic processes in medicine, imposing not only substantial physical burdens but also considerable psychological pressures on patients. These psychological pressures typically arise from fear, worry, and uncertainty regarding surgical outcomes, postoperative pain, and sudden changes in the patient's physical condition [1]. Psychological disorders such as anxiety, depression, and stress are prevalent in these circumstances and can give rise to numerous complications in the treatment and recovery process [2]. Accordingly, a precise understanding of the factors influencing emotion regulation and psychological management in surgical patients has become critically important.

Emotion regulation refers to cognitive and behavioral processes through which an individual can effectively identify, evaluate, and control their emotional responses. These psychological skills play a key role in reducing the intensity of negative emotions and enhancing an individual's capacity to cope with stressful situations [3]. In patients, the ability to regulate emotions can help reduce anxiety and depression and improve stress management, which can have numerous positive effects on the recovery process and the patient's quality of life. Numerous psychological studies have emphasized the importance of these skills in improving mental health, demonstrating that emotion regulation training and practice can be employed as an effective intervention to reduce the psychological burden on patients [4, 5].

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Anxiety disorders in surgical patients not only increase psychological distress and suffering, but may also disrupt the surgical process and postoperative recovery by triggering physiological responses such as elevated blood pressure, irregular heart rate, and inflammatory reactions. Furthermore, depression resulting from psychological stress can reduce patients' motivation to adhere to medical care and diminish overall quality of life [6]. This underscores the necessity of focusing on targeted and specialized psychological interventions so that mental health in patients can be enhanced through the strengthening of emotion regulation skills, ultimately yielding better therapeutic outcomes [7].

Emotion regulation skills encompass the precise recognition of emotions, analysis of emotional situations, and selection of appropriate coping strategies, enabling individuals to deal constructively with negative emotions rather than resorting to impulsive or avoidant reactions. This process increases individuals' capacity to manage emotions, reduce stress, and improve psychological functioning [8]. Teaching these skills in stressful medical conditions — particularly surgery — can be considered an effective preventive and therapeutic tool. Numerous studies have demonstrated that psychological interventions based on emotion regulation play an important role in reducing anxiety, depression, and stress in patients, resulting in significant improvement in their mental health [6].

Beyond the individual importance of emotion regulation skills, the role of healthcare systems and medical teams in providing specialized training and psychological support for surgical patients is of great significance. The treatment team can facilitate the development of emotion regulation skills by accurately assessing patients' psychological status and designing targeted educational programs [9]. Moreover, the creation of a supportive and motivating environment in healthcare facilities can enhance the effectiveness of these interventions, enabling patients to navigate the treatment and recovery process with greater confidence and tranquility [10]. Ultimately, a deeper understanding of emotion regulation mechanisms and their clinical applications in surgical patients can contribute to improving the quality of both psychological and physical care.

Khayati et al. (2023) investigated the effectiveness of dialectical behavior therapy on emotion regulation and health anxiety in patients with asthma. According to the results, there was a significant difference between the experimental and control groups on the reappraisal subscale of emotion regulation; however, no significant difference was observed on the suppression subscale. A significant difference was also found between the two groups regarding health anxiety. The findings indicate that dialectical behavior therapy can lead to improvements in emotion regulation and health anxiety in patients with asthma, and that this intervention is effective in improving these symptoms [11].

Miri Farzaneh et al. (2023) conducted a study entitled "Emotion Regulation Skills Training on Self-Control and Psychological Distress in Opioid-Dependent Individuals Hospitalized in a Psychiatric Hospital: A Quasi-Experimental Study." Following the intervention, the mean psychological distress scores of opioid-dependent patients decreased significantly in both the intervention group ($p < 0.001$) and the control group ($p < 0.005$). The results of ANCOVA, conducted to control for the effect of pretest scores, indicated a statistically significant difference in mean psychological distress scores between the two groups after the intervention ($p < 0.001$). Additionally, mean self-control scores increased significantly in both the intervention and control groups following the intervention ($p < 0.001$). ANCOVA results also revealed a statistically significant difference in mean self-control scores between the two groups post-intervention ($p < 0.001$). The findings demonstrated that emotion regulation training in opioid-dependent individuals led to a significant reduction in psychological distress scores and a significant increase in self-control scores. Therefore, it can have positive and inhibitory effects on behaviors that drive relapse to substance use, and it is recommended that emotion regulation skills training be utilized to improve psychological distress and self-control in individuals undergoing addiction treatment [12].

Omidi Badri et al. (2022) examined the effectiveness of emotion regulation training on perceived stress, self-efficacy, and sleep quality in elderly patients with type 2 diabetes. Results showed that the interaction effect of group × time on perceived stress, self-efficacy, and sleep quality was significant ($p < 0.01$), and implementation of the independent variable led to reductions in perceived stress and improvements in self-efficacy and sleep quality in the experimental group. Based on these findings, emotion regulation training can be used to reduce perceived stress and improve self-efficacy and sleep quality in elderly patients with type 2 diabetes [13].

Atta et al. (2024) investigated the effect of an emotion regulation intervention on challenges in emotion regulation and cognitive strategies in patients with depression. Emotion regulation difficulty scores of the 80 participants ranged from 158 to 169 ($164.5 \pm 3.21$), and they demonstrated less use of adaptive cognitive emotion regulation strategies and greater use of maladaptive cognitive emotion regulation strategies ($56.07 \pm 2.67$). Regarding the intervention group, the mean total score of emotion regulation difficulties in 30

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patients decreased from 167.35 ± 2.21 before the intervention to 105.85 ± 3.33 after the intervention ($p < 0.0001$). Total cognitive emotion regulation scores improved significantly from 54.07 ± 1.66 to 35.2 ± 3.46 ($p < 0.01$) [14].

Daros et al. (2021) conducted a study entitled "A Meta-Analysis of Emotion Regulation Outcomes in Psychological Interventions for Youth with Depression and Anxiety." Difficulties in applying emotion regulation (ER) skills are associated with depressive and anxiety symptoms and are common treatment targets. Psychological treatments significantly reduced depression, anxiety, emotion regulation difficulties, and functional impairment, while engagement with functional impairment also increased. Improvements in depression and anxiety were positively associated with improvements in ER skills engagement, reductions in emotion regulation difficulties, and reductions in ER skills non-engagement [15].

## Method

A quasi-experimental research design (pretest–posttest with an equivalent control group) was employed in this study. The statistical population consisted of patients undergoing surgery in Tehran. The research sample comprised 30 individuals selected through convenience and voluntary sampling, who were then voluntarily assigned to either a control group (n = 15) or an experimental group (n = 15). The research instruments were as follows:

(a) Depression Anxiety Stress Scales (DASS): This instrument was developed by Lovibond and Lovibond in 1995. The scale measures three constructs — "anxiety," "depression," and "stress" — and exists in two forms. The short form consists of 21 items, each construct assessed by 7 distinct statements. Responses are provided on a 4-point scale ranging from "never" to "always," scored from 0 to 3. In order to evaluate the psychometric properties of this scale, Lovibond and Lovibond (1995) administered it to a non-clinical sample of 2,914 individuals. Reliability of the scale, assessed using Cronbach's alpha, yielded acceptable values for the depression, anxiety, and stress subscales of 0.84, 0.84, and 0.91, respectively. The validity of the depression, anxiety, and stress scales, determined through concurrent validity with simultaneously administered tests, was 0.78, 0.62, and 0.72, respectively. In the study by Afzali et al. (2007), Cronbach's alpha coefficients were 0.98 for the anxiety scale, 0.84 for the depression scale, and 0.93 for the stress scale [16].

In this design, surgical patients were recruited through convenience and voluntary sampling and voluntarily assigned to experimental and control groups. Prior to the emotion regulation skills training sessions, all selected patients in both groups completed a pretest assessing anxiety disorders, including depression, stress, and anxiety. The role of the pretest was to serve as a covariate to enable comparison of anxiety disorder levels in the experimental and control groups across pretest and posttest phases. Following the delivery of emotion regulation skills training to the experimental group, a posttest was administered to both groups to determine whether the observed changes in anxiety disorder control were attributable to the emotion regulation skills training sessions.

Both descriptive and inferential statistics were used for data analysis.

## Results

Descriptive findings of the study are as follows:

**Table 1**. Means and standard deviations of depression control, anxiety control, and stress control scores for experimental and control group patients at pretest and posttest stages.

| Variable | Stage | Group | Mean | SD | n |
|---|---|---|---|---|---|
| Depression control | Pretest | Experimental | 20.73 | 3.41 | 15 |
| | | Control | 21.11 | 4.15 | 15 |
| | Posttest | Experimental | 45.86 | 8.56 | 15 |
| | | Control | 21.13 | 2.66 | 15 |
| Anxiety control | Pretest | Experimental | 11.13 | 2.44 | 15 |
| | | Control | 20.60 | 1.50 | 15 |
| | Posttest | Experimental | 19.33 | 2.43 | 15 |
| | | Control | 20.02 | 1.73 | 15 |
| Stress control | Pretest | Experimental | 10.66 | 1.75 | 15 |
| | | Control | 18.20 | 2.15 | 15 |
| | Posttest | Experimental | 18.46 | 1.80 | 15 |
| | | Control | 16.86 | 2.44 | 15 |

As shown, for depression control at the posttest stage, the mean and standard deviation were 20.73 and 3.41 for the experimental group and 21.11 and 4.15 for the control group; at the pretest stage, the corresponding

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values were 45.86 and 8.56 for the experimental group and 21.13 and 2.66 for the control group. For anxiety control at the posttest stage, the mean and standard deviation were 19.33 and 2.43 for the experimental group and 20.02 and 1.73 for the control group; at the pretest stage, the values were 11.13 and 2.44 for the experimental group and 20.60 and 1.50 for the control group. For stress control at the posttest stage, values were 18.46 and 1.80 for the experimental group and 16.86 and 2.44 for the control group; at the pretest stage, values were 10.66 and 1.75 for the experimental group and 18.20 and 2.15 for the control group.

To test the research hypotheses, multivariate analysis of covariance (MANCOVA) was employed. Results are presented in the following tables.

The first hypothesis stated that "emotion regulation skills training is effective in controlling depression in surgical patients."

The second hypothesis stated that "emotion regulation skills training is effective in controlling anxiety in surgical patients."

The third hypothesis stated that "emotion regulation skills training is effective in controlling stress in surgical patients."

**Table 2**. Results of multivariate analysis of covariance on posttest mean scores of depression control, anxiety control, and stress control in experimental and control groups with pretest as covariate.

| Test | Value | Hypothesis df | Error df | F | p | Effect size | Statistical power |
|---|---|---|---|---|---|---|---|
| Pillai's trace | 0.93 | 6 | 17 | 520.60 | < 0.001 | 0.93 | 1 |
| Wilks' lambda | 0.05 | 6 | 17 | 520.60 | < 0.001 | 0.93 | 1 |
| Hotelling's trace | 18.56 | 6 | 17 | 520.60 | < 0.001 | 0.93 | 1 |
| Roy's largest root | 18.56 | 6 | 17 | 520.60 | < 0.001 | 0.93 | 1 |

As shown in the table, with the pretest controlled, the significance levels of all tests indicate that there is a statistically significant difference between the experimental and control group patients on at least one of the dependent variables (depression control, anxiety control, and stress control) ($F = 520.60$, $p < 0.001$). To determine which specific variables differed between the two groups, univariate analyses of covariance were conducted within the MANCOVA framework; results are presented in Table 3. The effect size was 0.93, meaning that 93% of individual differences in posttest scores for depression control, anxiety control, and stress control are attributable to the effect of emotion regulation skills training. Statistical power equaled 1, indicating no risk of Type II error.

**Table 3**. Results of univariate analyses of covariance within the MANCOVA framework on posttest mean scores of depression control, anxiety control, and stress control in experimental and control groups with pretest as covariate.

| Variable | SS | df | MS | F | p | Effect size | Statistical power |
|---|---|---|---|---|---|---|---|
| Depression control | 3015.22 | 1 | 3015.22 | 79.10 | < 0.001 | 0.77 | 1 |
| Anxiety control | 402.58 | 1 | 402.58 | 139.87 | < 0.001 | 0.87 | 1 |
| Stress control | 261.77 | 1 | 261.77 | 69.17 | < 0.001 | 0.74 | 1 |

As shown in the table, with the pretest controlled, a statistically significant difference was found between the experimental and control groups in depression control ($F = 79.10$, $p < 0.001$). In other words, emotion regulation skills training, given the higher mean depression control scores in the experimental group compared to the control group, led to an improvement in depression control in the experimental group. The effect size was 0.77, indicating that 77% of individual differences in posttest depression control scores are attributable to the effect of emotion regulation skills training. The first research hypothesis is therefore confirmed.

As shown in Table 3, with the pretest controlled, statistically significant differences were also found between the experimental and control groups in anxiety control ($F = 139.87$, $p < 0.001$) and stress control ($F = 69.17$, $p < 0.001$). In other words, emotion regulation skills training, given the higher posttest means for anxiety and stress control in the experimental group relative to the control group, resulted in enhanced anxiety control and improved stress management in experimental group patients. The effect sizes indicate the percentages of individual differences in posttest scores for anxiety and stress control attributable to the effects of emotion regulation skills training. The second and third research hypotheses are therefore confirmed.

## Discussion

The present study comprehensively and rigorously examined the effect of emotion regulation skills training on the reduction of anxiety disorders — including depression control, anxiety control, and stress control — in surgical patients. Results demonstrated that

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training in these skills led to a statistically significant improvement in patients' control of negative emotions, with 93% of the observed changes in posttest variables attributable to this training. These findings highlight the considerable importance of emotion regulation-based psychological interventions in the physical and mental health of surgical patients, indicating that emotion regulation skills can be employed as an effective tool to reduce psychological disorders before and after surgery, thereby contributing to improvements in patients' quality of life and a reduction in the psychological complications associated with the treatment process [10].

Furthermore, the disaggregated analysis of the research hypotheses demonstrated that emotion regulation skills training had a separately significant and positive effect on each of the dimensions of depression, anxiety, and stress. These results, obtained with pretest control, confirm the key role of emotion regulation in empowering patients to better cope with the psychological pressures associated with surgery. It can therefore be concluded that specialized psychological training, particularly emotion regulation skills, can — in addition to reducing patients' psychological burden — be considered an effective preventive and therapeutic intervention in the management of anxiety disorders. These findings suggest that healthcare systems and surgical medical teams should pay particular attention to delivering emotion regulation skills training to their patients in order to achieve better clinical outcomes and to provide comprehensive support for patients' mental health.

Given the limited sample size, generalization of the present findings to larger samples and populations is not feasible. Accordingly, to extend the generalizability of these findings, it is recommended that emotion regulation skills training be implemented with larger sample sizes to address patients' psychological problems and to enable broader generalization of results.

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***Authors' Contribution***

Authors conceptualized the study objectives and design.

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None

***Ethics***

The research data and literature have not been copied from any works. Data are available from the corresponding author upon reasonable request.

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