

# Efficacy of emotion regulation training on pain intensity and life quality in patients with peptic ulcer disease (PUD)

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## ABSTRACT

**Aim:** Because gastric ulcer is a psychosomatic disease involving many psychological factors like assertiveness and cognitive beliefs, this study aimed to investigate the effectiveness of emotion regulation training on pain intensity and quality of life in patients with peptic ulcer disease.

**Background:** Gastric ulcer, a recurrent and common disease worldwide, is associated with gastrointestinal symptoms and lower health-related quality of life. Psychological factors and stress have been recognized as important contributors to the onset and duration of gastric ulcer, highlighting the need for effective psychological interventions to improve pain intensity and quality of life in patients.

**Methods:** The research method was semi-experimental and based on the pretest-posttest control group design, with follow-up after three months. The sample included 46 participants selected by a Purposive Sampling method and placed randomly in the experimental and control groups. At first, simultaneously, and under the same conditions, all the participants responded to the Chronic Pain Grade Questionnaire (CPG) and Quality of Life Questionnaire (SF-12). The emotion regulation training was performed on the experimental group. In the end, both groups were evaluated by posttests, and then they were tracked after three months. To analyze data, the ANCOVA test was applied through SPSS 22.

**Results:** Findings showed that emotion regulation training was meaningfully effective in decreasing pain intensity and increasing life quality ( $p < 0.01$ ), but after three months interval, no significant changes were found in the results.

**Conclusion:** Due to the results about emotion regulation training protocol that has successfully reduced pain intensity symptoms in PUD patients and increased life quality, it is suggested that this protocol can be added to other treatments for PUD patients.

**Keywords:** Emotion regulation, Pain intensity, Quality of life, Peptic Ulcer Disease (PUD).

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## Introduction

Gastric or peptic ulcer is one of the most common and recurrent diseases worldwide (1). Its annual incidence is 1.1-3.3%, and its prevalence is 1.7-4.7%. About 10 percent of people in the United States suffer from the disease during their lifetime; the same is true in Europe (2). Patients with PUD may have a variety of gastrointestinal symptoms, including abdominal pain,

vomiting, and upper gastrointestinal bleeding, which are associated with high mortality and morbidity (3). Given that this disease can lead to many gastrointestinal symptoms such as pain, nausea, anorexia, and limitations in social health, it is important to evaluate their overall impact on the patient's health-related quality of life (HRQOL) and psychological health. Several studies have shown that patients with PUD have lower HRQOL and mental health than the general population, and improvement in HRQOL plays an important role in the treatment of the disease (4). It is hoped that the use of appropriate psychotherapy tools can improve the

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understanding of the treatment needs and psychological services of PUD patients (2).

Emotional stress and psychological factors are often recognized as important factors in PUD (5). Since the middle of the twentieth century, stress has been considered the main cause of PUD (6). Several studies have suggested that psychological stress may play an important role in the onset and duration of the PUD period (7). Studies have also shown that people with anxiety disorders (8), personality disorders, and panic disorders are more likely to have PUD (9). People with neuroticism (10) or a history of childhood abuse are also more likely to develop PUD (11). The destructive effect of stress on PUD in a Japanese study showed that increased gastric ulcer bleeding in older adults was caused by a catastrophic earthquake in Japan (12).

Recent studies have indicated that psychological treatments, particularly emotion regulation protocols, could effectively improve the quality of life (13-15). However, few studies have indicated the efficacy of psychological intervention on gastric patients (16), the effectiveness of these interventions has been controversial (17), and the benefit of these interventions has been under question (18). The emotion regulation protocol invented by Brooks (1980) was used for duodenal ulcers (19), and it hasn't been used in gastric ulcer patients. Since gastric ulcer is a chronic disease related to psychological factors and the quality of life of these patients decreases over time, this study investigated the effectiveness of emotion regulation protocol on pain intensity and life quality in order to find an effective program to reduce pain and increase the quality of life of these patients.

## Methods

A multi-center RCT was conducted throughout Tehran city between October and December 2021. People who had met the inclusion criteria were solicited to sign up for this study between September and November 2021. Eligible participants were randomly allocated to the immediate experimental condition or a waitlist control group. People in the experimental condition started HR within two weeks after allocation. All participants completed questionnaires at pre-treatment (T1), 8 weeks post-treatment (T2), and at follow-up 12 weeks (F1).

## Ethical considerations

Information of all patients remained confidential, and informed consent was obtained before the study. The study protocol was approved by a local ethics committee (code: IR.SBMU.MSP.REC.1400.519). It was also approved by the Iranian Registry of Clinical Trials (code: IRCT20201103049252N2).

## Procedure

To conduct the research, one of the hospitals under the auspices of Shahid Beheshti University of Medical Sciences was selected by convenience sampling. Participants had to meet the following inclusion criteria: 1) being between 18 to 50 years old, 2) mastering written and spoken Persian, and 3) having peptic ulcer with endoscopic index and gastroenterologist approval through clinical symptoms. People interested were excluded when they suffered from a substance use disorder, psychotic disorder, or cognitive disability (e.g., Intellectual disability). As reported by the therapist based on the intake interview, in case a person reported a positive answer option on a suicidal ideation item of the questionnaire, he was referred to the psychiatrist and was excluded from the research.

Initially, 215 people were interviewed. Of these, 85 had answered the questionnaires. 46 participants were divided into two groups: control and experimental. In this study, all subjects participated in the post-test, and no one left the treatment.

At first, the participants were asked whether they wanted to be informed about a study in which psychological help was offered to persons experiencing ulcer peptic disease. If they answered "yes", an information form about the RCT was given to them for signing, including an informed consent form. After receiving the completed informed consent form, in- and exclusion criteria were checked. Eligible participants were randomized to the experimental or waitlist control condition by using a randomization procedure carried out by an independent researcher. The researchers completely reimbursed therapy costs.

## Tools

### Pain intensity questionnaire

This scale was developed by Von Korff (1990) to measure the severity of chronic pain. This scale has seven items. This questionnaire evaluates three axes: Pain intensity, duration, and degree of disability.

resulting from pain. The respondent rates each of the seven test queries on an eleven-point scale of 0-10. The individual's test score is calculated in three subscales: pain intensity, disability score, and degrees or levels of disability. The minimum possible score will be 0, and the maximum 70. A score between 0 and 20 is low pain. A score between 20 and 35 is moderate pain. A score above 35 is high (20). Fielding and Wang (2012) reported a Cronbach's alpha coefficient of 0.68 (21).

### **12-Item Short Form Health Survey (SF-12)**

The 12-item health survey questionnaire is used simultaneously as the 36-item questionnaire at different levels. The 12-item version was developed in 1996 by Ware and colleagues (22). This questionnaire has 8 subscales: physical function, physical health, emotional problems, physical pain, social function, vitality, energy, and mental health. Due to the small number of items, the person's overall score is often used. Montazeri and colleagues (2009) reported a Cronbach's alpha coefficient of 0.73 (23).

### **Treatment**

This treatment has been conducted in the Ayatollah Taleghani Hospital. The therapist received (upon request) supervision from the last three authors. The therapist received three-day training about the protocol, was asked to report about the therapy progress daily, and was monitored about treatment fidelity.

The treatment protocol consisted of 8 sessions (each 60 minutes) and 8 weeks. This protocol is based on the Brooks treatment of 1980, which was developed to treat duodenal ulcers (19). Patients in the treatment group received a handbook that A) Explained the rationale of the treatment plan in terms of the relationship between anxiety, emotional control, and gastric ulcer, B) graphically showed a constant cycle of worry and anxiety, (C) identified several main irrational beliefs that lead to unnecessary anxiety, (D) provided examples of negative self-talk, positive self-talk, and general self-confrontation, E) explained the concept of decisiveness, (F) provided examples of indecisiveness, aggressiveness, and assertive behaviors, (G) provided a space for recording important experiences with newly learned behaviors, and (h) provided charts for recording daily wound pain during the follow-up period.

The handbook for control patients included only (a) a general description of the relationship between anxiety, emotional control, and gastric ulcer and (b) diagrams for recording daily ulcer pain during the follow-up period.

The emotional skills training program consisted of eight 60-90 minute treatment sessions performed separately with the patients in the treatment group. All treatments were performed by the first author. Patients received four sessions of treatment focusing on anxiety management training and four sessions of training for courage and decisive expression of emotions.

**Anxiety Management Training:** The program's anxiety management department followed Richardson (1976)'s plan; typically, the first four of eight treatment sessions were devoted to training. During an initial training phase, the patient, with the help of the therapist (a), examined their irrational, erroneous, and anxious beliefs (Ellis, 1973; Richardson) and negative self-talk about various stressful everyday situations. (b) Identified, developed, and wrote examples of meaningful, alternative, more realistic, and relaxing personal beliefs in self-talk.

**Training for Assertiveness:** The second 4 sessions were dedicated to this training. The component of courage training and emphatic expression of emotions and emotional skills training program followed the broad format proposed by Lazarus (1971). The two main stages of this component were (a) cognitive reconstruction, focusing on correcting misconceptions about assertiveness and the consequences of non-judgment (with particular reference to wound problems), and (b) practicing the behavior of relevant situations in patients' daily homes and workplaces. For example, most patients reported irreversible behaviors in interpersonal situations as a way to "control" emotions and avoid emotional distress (as directed by the therapist). Much of the courage training time was spent pointing to the need to learn self-awareness. Chronic resentment with periodic outbursts of anger and subsequent stressful guilt was severely emphasized.

Treatment, as usual, was performed in the control group. In this group, contacts were made with patients once a week for 15 minutes for 6 weeks, but no major psychological interventions were performed. In this group of patients, attention placebo treatment was performed. After the end of treatment, post-tests and follow-up interventions according to the protocol

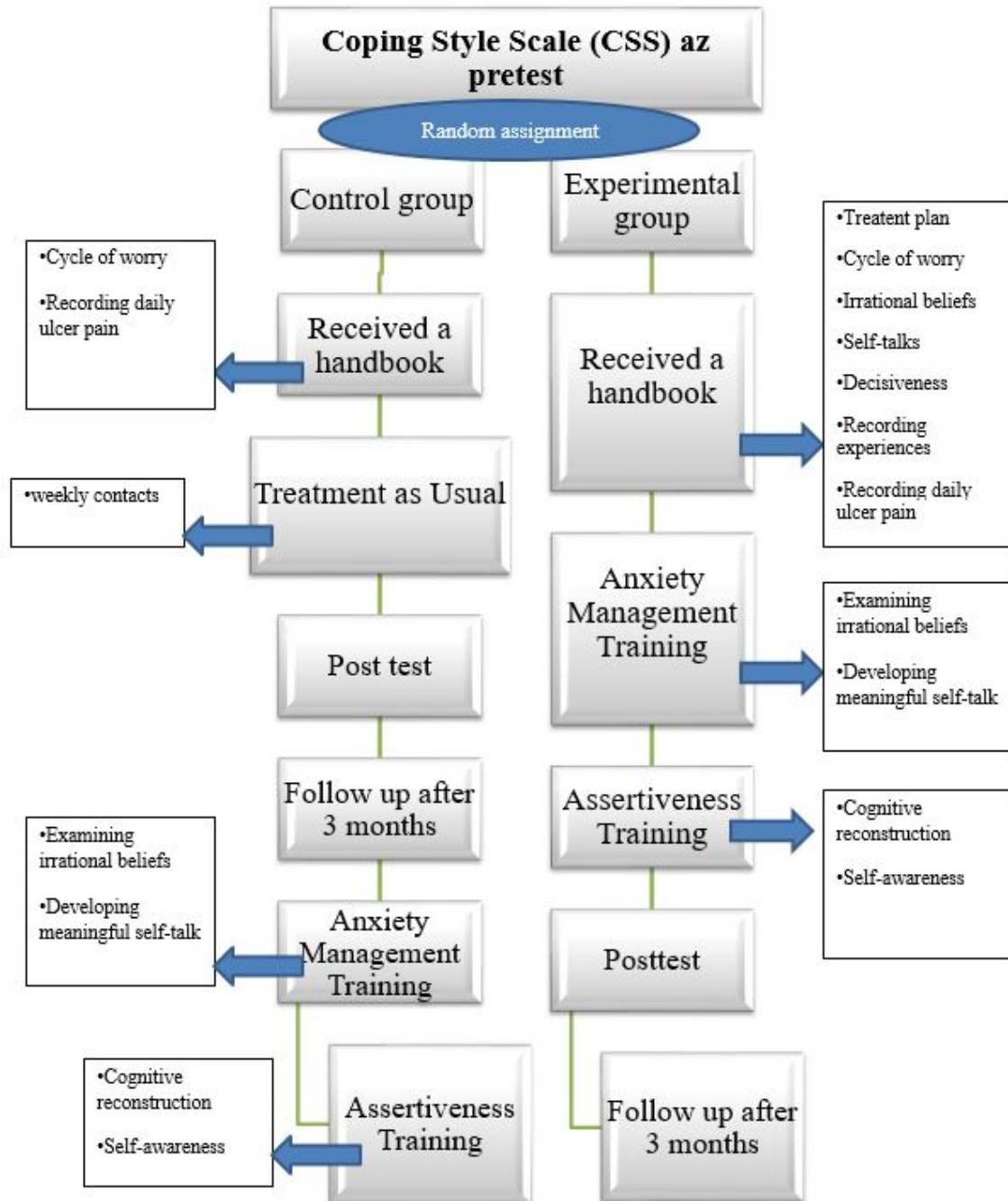


Figure 1. Summary of the procedure (24)

were performed for this group. Figure 1 summarizes the procedures performed on the control and experimental groups.

### Data analysis

Data was collected on the baseline pre-intervention and the last day of the 4th-week post-intervention. SPSS version 22.0 was used for analysis. Data analysis

included descriptive characteristics of the subjects and ANCOVA tests.

### Results

The experimental and control groups consisted of 22 and 24 patients, respectively. The age range of the experimental group was between 18 and 40 years, with a mean of 32.54 and a standard deviation of 2.21. Among

the participants were eight undergraduates, six diploma holders, five bachelor's degree holders, and three master's degree holders. Regarding marital status, 68.2% of the experimental group were single, while 31.8% were married. The control group had a minimum age of 18 and a maximum age of 38, with a mean of 34.12 and a standard deviation of 3.65. This group comprised nine undergraduates, eight diploma holders, five bachelor's degree holders, and two master's holders. Additionally, 58.3% of the individuals in the control group were single, while 41.7% were married. More information on the demographics of the participants is presented in Table 1. Also, descriptive statistics are presented in Table 2.

As Table 3 shows, there is a significant difference between the experimental and control groups in the life quality posttest scores. So it can be concluded that emotion regulation effectively improves life quality in PUD patients.

As Table 4 shows, there is a significant difference between the experimental and control groups in the Pain

intensity post-test scores. So it can be concluded that emotion regulation is effective in reducing pain intensity symptoms in PUD patients ( $p < 0.01$ ).

**Discussion**

This study aimed to evaluate the efficacy of emotion regulation training on pain intensity and quality of life in patients with peptic ulcer disease (PUD). The results showed that emotion regulation could effectively reduce pain intensity and improve quality of life. This means that their symptoms were significantly reduced for the patients who participated in the healing process. This result is consistent with studies (25-28) based on emotion regulation training. Other studies, like Saeedi et al., showed that emotion regulation and empathy in patients with chronic pain can be effective in reducing their symptoms (29). It was also consistent with the study of Brooks (1980), who investigated the emotion regulation protocol on the duodenal ulcers and reported the

**Table 1.** Demographic information of participants in the experimental and control groups

Variables	Experimental Group	Control Group
Age (y)	32.54_2.21	34.12_3.65
Sex		
Male	8	11
Female	14	13
Education		
Under diploma	8	9
Diploma	6	8
Bachelor's degree	5	5
Master's degree	3	2
Marriage status		
Single	15	14
Married	7	10

**Table 2.** Descriptive statistics

Scales	levels	Experimental group		Control group	
		Mean	Std.Deviation	Mean	Std.Deviation
Life quality	Pretest	24.00	2.708	25.08	3.256
	Posttest	38.55	3.501	25.04	3.277
	Follow up	38.59	3.554	25.08	3.256
Pain intensity	Pretest	45.27	11.913	38.46	16.384
	Posttest	18.09	5.182	38.46	16.384
	Follow up	18.05	5.113	38.42	16.394

**Table 3.** Covariance analysis of Life quality in the groups' post test

Source	SS	df	MS	F	P
Life quality	188.597	1	188.597	25.679	<0.0001
Group memberships	2254.367	1	2254.367	306.944	<0.0001

**Table 4.** Covariance analysis of Pain intensity in the groups' post test

Source	SS	df	MS	F	P
Pain intensity	738.42	1	738.42	14.18	0.01
Group memberships	1367.29	1	1367.29	26.26	<0.0001

effectiveness of this protocol (19). These results are consistent with Leehr et al.'s (2015) research, showing emotion regulation protocol is effective in eating disorder patients (30). In explaining this hypothesis, it can be said that the success of emotion regulation in reducing pain intensity may be related to the variety of assertive techniques of this treatment. Teaching assertiveness in the first phase of treatment, such as emotion exploration, emotion tolerance, emotion expression, and emotion design, helps the client to identify and express their feelings and emotions. Identifying and developing examples of meaningful, alternative, more realistic, and relaxing personal beliefs in self-talk in the second stage of treatment identifies hidden and repressed emotions and reprocessing leads to perceptual and cognitive change. This cognitive change helps the patient to experience less anxiety and so less pain intensity. This reducing in pain intensity can lead to increasing life quality.

The primary goal of treatment in chronic diseases is to maximize patients' performance in daily activities and achieve the highest well-being level. In some studies like Ikeda and colleagues (2015), it has been suggested that in chronic diseases like psychosomatic diseases, especially gastrointestinal diseases, the patient's quality of life as a whole, social, marital, and family, and adaptation to stressful events is considered (31). In this protocol, cognitive reconstruction focusing on correcting misconceptions about assertiveness and the consequences of non-judgment (with particular reference to wound problems) and practicing the behavior of relevant situations in patients' daily homes and workplaces was an important part of treatment. Focusing on the patients' daily events and training the adaptive behaviors can somehow explain the increasing life quality.

As the results showed, treatment effects continued during the 3-month follow-up period, and in some cases, the healing process continued. Although patients' scores after the intervention showed that pain intensity symptoms had much decreased compared to before treatment, symptoms still have not completely disappeared. To explain this, the symptoms experienced by the subjects were very severe and painful, and the subjects have been struggling with PUD for a long time. Therefore, complete treatment of the symptoms will require more patience and treatment. In peptic ulcer disease, the risk of declining quality of life increases. Identifying different aspects of the quality of life in these patients can guide them in

planning educational programs and performing appropriate interventions to improve their quality of life.

Similar to the findings of the present study and the findings of other studies, pain is a determinant of quality of life that causes peptic ulcer disease to be different from many other chronic diseases. It affects the physician's assessment of the patient's health and disability and medication use status. Therefore, the effectiveness of psychological protocols reported in this study necessitates prioritizing pain management strategies in interventions. It mentions psychological treatment as well as health education interventions and drug treatments of these patients.

### Conclusion

Due to the positive changes in the criteria of this protocol's effectiveness, which are referred to in clinical studies as indicators of the effectiveness of a treatment method, it is concluded that emotion regulation training has been successful in reducing the symptoms of pain intensity in PUD patients and increasing life quality, this treatment can be added to other treatments for PUD patients.

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### Conflict of interests

The authors indicate no potential conflicts of interest.

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