

The Effectiveness of Mindfulness-Based Stress Reduction (MBSR) on Depression, Anxiety and Stress in women with Gastroesophageal Reflux Disease

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Abstract

Introduction: Gastroesophageal reflux disease is one of the most common diseases of the gastrointestinal tract. Stressors along with anxiety and depression, reduce a person's ability to cope with life's problems and play an important role in exacerbating the symptoms of GERD. Women are more fragile and vulnerable in this situation. This study investigates the effectiveness of mindfulness-based stress reduction on depression, anxiety, and stress in women with gastroesophageal reflux disease.

Method: The present study is a pre-test, post-test and follow-up design. Sampling was done purposefully, in which 30 women with gastroesophageal reflux disease who were referred to Hazrat Rasool Akram Hospital in Tehran were randomly selected. They were divided into experimental and control groups. The experimental group underwent stress reduction-based mindfulness training in 8 sessions in 2-hour. The control group did not receive any training. Data were collected using the Depression, Anxiety and Stress Scale (DASS-21). All participants completed the questionnaire at three time points (pre-test, post-test, follow-up). Data obtained from the research were analyzed by analysis of covariance (ANCOVA and MANCOVA) using SPSS software.

Results: The results showed that stress-based mindfulness training is effective in reducing depression, anxiety and stress in women. ($p < 0.05$)

Conclusion: The results showed that the effectiveness of stress-based mindfulness therapy could be used as a complementary intervention method along with other common therapies to improve depression, anxiety and stress in women with gastroesophageal reflux disease.

Declaration of Interest: None

Keywords: Mindfulness based on stress reduction, Depression, Anxiety, Stress, Gastroesophageal reflux disease.

Introduction

Gastroesophageal reflux disease (GERD) is a chronic disease caused by reflux of stomach contents into the esophagus. It is accompanied by several unpleasant symptoms and may restrict personal daily activity (1). The health problem consisting of typical symptoms such as acid regurgitation and heartburn at least once weekly (2). The disease is a defect in the natural anti-reflux barrier that causes the contents to reverse to the esophagus causing clinical symptoms or mucosal damage (3,4). Distinction between natural or physiological reflux with gastroesophageal reflux disease is unclear, physiological reflux usually occurs after meals short-term but pathological reflux is associated with symptoms or mucosal damage and often involves nocturnal episodes. In fact in this disease the contents of the stomach return to the mouth minutes after eating especially spicy, fatty and watery foods, causing a burning sensation in the back of the sternum which usually takes a few minutes (5). Although it has a benign nature, it can have serious consequences if neglected and prolonged and has a significant impact on patients' quality of life (6).

Disease returning acid from the stomach to the esophagus will lead to injuries, including these injuries: Ulcer at the junction of the stomach and esophagus (due to inflammation of the esophagus, its mucous tissue is damaged and leads to ulcers); Resistant narrowing of the esophagus involving esophagitis (inflammation of the esophagus from Reflux occurs); Barrett's esophagus (change of tissue or conversion of end

esophageal tissue to cells lining the intestinal wall); Esophageal adenocarcinoma (is a type of esophageal cancer and between 50% and 80% of this type of cancer is included) (7). Several risk factors have been correlated with GERD by several studies, these factors include dietary habits, tobacco smoking, obesity and stress (8). The incidence of this disease is increasing in most western and some Asian countries (3). The prevalence of the disease is estimated of 2.5%-7.8% in East Asia, 8.8%-25.9% in Europe, and 18.1%-27.8% in North America (9). In one study, the prevalence was 9% among students at the University of Tehran (10) and 11.3% among blood donors at the Tehran Blood Transfusion Center (11). The impact of psychological factors such as stress, anxiety and depression on incidence of physical and mental illness is undeniable, for the example in modern life stress is more prevalent than ever and has been recognized as a possible cause of common diseases such as hypertension, heart disease, anxiety and depression (12). Stress is a physical-psychological stimulus that can disrupt an individual's adaptation state and elicit coping responses, Acute and chronic stress may become so concentrated that they cause strain reactions (13). This pressure may negatively affect the physical and mental condition of people (14). It has already been documented that stress and psychological comorbidities may predispose individuals to be more vigilant for physiological sensations which may result in enhanced response to a painful stimulus or a painful response to an innocuous stimulus (15). Studies show that people with chronic illnesses are more at risk for psychological stress, and the

severity of the illness and the lack of psychological support are effective in reducing the level of stress caused by chronic illnesses (16). Accordingly, coping strategies have been considered as a factor in intervening the stress and medical disorders (17). The findings support the role of pathogenesis of psychological factors in the gastroesophageal reflux phenomenon (18). More than 60% of gastroesophageal reflux patients admit that the symptoms of the disease are exacerbated by stress (19). Some studies have shown that progressive movements at the esophagus end result in stressful questions, so stressful conditions may be closely linked to the disease (20). Stress affects the rate of acid secretion and even gastric motility (21).

Studies show that stressors are different between men and women and in women mostly than men (22). Anxiety is one of the most common disorders in human societies that afflict many people (23). Anxiety is a response to uncertainty about a possible threat or challenge. More specifically, when one feels anxious, one sees one's situation as involving a threat or challenge whose potential is unpredictable, uncontrollable, or otherwise open to question (24). An unpleasant emotion that is expressed in terms of distress, worry and fear, and with behavioral, cognitive and physiological symptoms such as sweating, tremor, and lack of concentration (25).

The prevalence of anxiety in women is generally higher than in men (26). Anxiety is always present along with depression and it is difficult to determine the severity and delay of these two disorders in patients (27). Depression is one of the most common mood disorders mainly associated with social and psychological factors caused by environmental events

(28). In general, depression is associated with change in mood, and its obvious symptoms are depressed or irritable mood and loss of interest and pleasure (29). The according to DSM-5, depression is a mental illness, Individuals with persistent depressive disorder describe their mood as sad or "down in the dumps," During periods of depressed mood, at least two of the six symptoms should be presented, because these symptoms have become a part of the individual's day-to-day experience (30). According to the World Health Organization, 121 million people around the world are depressed, making it the fourth most prevalent disease in the world and is projected to rise from fourth to second in 2020 (31). The disorder is usually more severe and more common in women than men (32). Many studies have shown that patients with reflux are more depressed than others (32). People feel guilty and depressed because of the unpleasant consequences of gastroesophageal reflux disease (33). The World Health Organization (WHO) estimated that the prevalence of depression in the global population was as high as 4.4% in 2015, and the prevalence of anxiety disorders was estimated to be 3.6% (34). Given the high incidence of these disorders and their negative impacts on all walks of life, various treatments and interventions have been used to reduce the symptoms of depression, anxiety and stress, each with its own benefits and complications. Over the past ten years, there has been a wave of interest in the use of mindfulness-based techniques in the treatment of psychological conditions which have created a body of empirical evidence for the effectiveness of such an approach (35). The mindfulness therapy

approach is defined as the state of arousal and awareness of what is happening in the present moment (36). This is purposeful attention with acceptance without judgment about recent ongoing experiences. The mindfulness helps us to recognize that negative emotions may happen, but they are not a permanent component of personality. Also, it prepares opportunity for an individual to respond to events with contemplation rather than no thought (37).

Mindfulness-based stress reduction is an effective intervention that Kabat Zinn used to treat the psychological effects of chronic diseases (stress, anxiety and depression, MBSR was originally designed for patients with chronic medical conditions to help reduce stress and improve their quality of life via focused attention, meditation, cognitive restructuring and adaptive learning techniques (38).

Kabat Zinn cites stress as a factor affecting different levels, including physiological, psychological, and social levels, as expected, these levels interact with each other, and this multiple interaction affects the current state of the body and mind under specific conditions, these levels also affect the situations people face and the stressful events they face (39). Since, the Mindfulness practice improves the understanding of physical symptoms. This understanding of symptoms can increase our awareness of thoughts and emotions that are caused by physical symptoms or are preceded by physical symptoms (40), encompasses "improved self-observation that promotes better coping skills" (41). Extensive research on adult populations has proven the effectiveness of mindfulness therapy in a variety of areas

such as stress management and anxiety and promoting emotion regulation skills (42). Given the importance of mental health in patients with gastroesophageal reflux disease in pursuit of treatment and prevention of complications and lack of applied studies in this field, this study aimed to investigate the effectiveness of mindfulness-based stress reduction intervention in modulating common psychological complications Gastroesophageal reflux disease (depression, anxiety and stress) was performed.

Method

The present study is a quasi-experimental design with pretest, post-test and follow-up. The ethic code for this research was IR.PNU.REC.1397.073. The statistical population includes all women with gastroesophageal reflux disease who referred to the gastrointestinal clinic of medical sciences hospitals in Tehran in the second half of 1397. Statistical sample According to inclusion and exclusion criteria, 30 people were selected by purposive sampling from women with reflux who referred to Hazrat Rasool Akram Hospital.

Inclusion criteria were: Diagnosis of gastroesophageal reflux disease by a gastroenterologist, age range 20-55 years, being female, lack of psychological illnesses such as depression, concomitant depression, and schizophrenia. Exclusion criteria included:

Absence of participants undergoing more than three sessions, chronic and debilitating illnesses such as cancer, Alzheimer's and Parkinson's, have undergone other psychological treatments. Participants were randomly divided into experimental (n = 15) and

control (n = 15) groups. Then the experimental group received 8 sessions of stress-reduction mindfulness training for 2 hours. There was no intervention for control group. Summary of mindfulness-based stress reduction treatment sessions are presented in Table 1. After the training sessions, the post-test was administered to both groups. Following the two-month follow-up plan, questionnaires were re-submitted to all participants and then all data were collected. Data were analyzed by analysis of covariance using SPSS software.

Depression, Anxiety and Stress (DASS-21):

Dependent variables were measured by DASS-21 depression, anxiety and stress questionnaire. These measures were developed by Lovibond and Lovibond (43) and contain 21 expressions related to negative symptoms (depression, anxiety,

and stress). After reading each phrase, the participant should rate the severity / frequency of the aforementioned symptom he / she has experienced over the past week using a four-point scale (zero to three). Each of the three measures has 7 questions, and the score on each of the three subscales of the scale is obtained by summing the expressions belonging to the sub-scale.

Initial evidence indicates that DASS-21 is of good convergent and discriminant validity. Cronbach's alpha reliability for the subscales of depression, anxiety, and stress was acceptable at 0.84, 0.84, 0.91, respectively, which was consistent with what was obtained in the clinical population. This form has been validated in the Iranian population and its validity has been reported using Cronbach's alpha for depression 0.7, anxiety 0.66 and stress 0.76 (44).

Table 1: Summary Protocol of Mindfulness-Based Stress Reduction Sessions (MBSR)

First session: Automatic Guidance	Step One: An Exciting Journey and Expressing Goals and Expectations in Meetings - Explaining the Automated Guidance System Exercise 1: Conscious Eating (Raisins); Exercise 2: Training and Practicing Body Scanning Technique (Homework): Experiencing at least one conscious meal.
Second session: Removing Obstacles	Ways to overcome barriers to exercise (restlessness) - Exercise 3: conscious breathing (breath exhaustion); Exercise 4: conscious attention to daily activities (washing dishes, brushing). Homework: Choosing a daily style activity Mindfulness - Body Checking Exercise with Recorded Voice - Repeated conscious breathing three times a day in different situations (this exercise is repeated every week as a homework assignment)
Third session: Mindfulness in Motion	Exercise 5: Standing Stretching Exercises; Exercise 6: Mindfulness Walking. Homework: Standing stretching exercises on even days and walking consciously with the sound recorded at your place of residence and odd days the body examiner.
Fourth session: Stay in the moment	Exercise 7: Sit Consciously; Exercise 8: Listen to Others Deeply. Explanations of Judgment and Reasons for Negative Mind Judgment. Homework: Three times a day to consciously breathe and Conscious sitting on even days.
Fifth session: Acceptance and Allowance	Explanation of the concept of acceptance and its use in the face of adverse problems and experiences. Exercise 9: Lake Meditation and its Relation to Exercise 10: Accepting Pain or Any Annoying Thing and Conditions We Don't Like. Familiarity with the concept of stress. Homework: conscious sitting - one day body checking - conscious stress experience.

Sixth session: Thoughts are not real	Getting to know depression and anxiety and how to deal with anxiety thoughts (room full of water). Practice 11: Awareness of Thoughts; Practice 12: Awareness of Emotions. Homework: even days Conscious Walking - odd days Standing Stretching Exercises
Seventh session: Take care of yourself	Exercise 13: Day of Silence (sophistication and awakening); Exercise 14: Learn to love through meditation Homework: Combine a few exercises this week in 2 turns. Conscious attention to everyday repetitive tasks.
Eighth session: Concluding	Exercise 15: Perform a body checkup by identifying sticky thoughts in daily life; Exercise 16: Doing nothing - Dropping (firefighter and hose dropping off in space) - Preventing recurrence (talking about relapsing symptoms). Discover potentials in yourself. Reminder: Practice as much as you can.

Result

The mean age of the experimental group was 39.33 and the control group was 41.93 years. Education rate level of diploma and sub-diploma, post-diploma and bachelor's degree, master's degree and higher in the experimental group were 40%, 46.7%, 13.3% and in the control group was respectively 7.3%, 46.33%, 20%. Marital status, single and divorced / widowed in the experimental group respectively were 13.3%, 73.3%, 13.3%, and in the control group, 13.3%, 66.7%, 20%.

Employment rate in the experimental group 26.7% housewives, 23.3% employed and in the control group, 20 % housewives and 30 % were employed.

As can be seen in Table 2, post-test and follow-up scores were respectively in depression (12.93 ± 1.032), (12.93 ± 2.491), anxiety (12 ± 1.511), (11.51 ± 1.830) and stress (13.06 ± 1.830) (12.93 ± 1.830) were significantly different from pre-test.

Table 2. Mean and standard deviation of depression, anxiety, and stress

variable	Group	pre-test		post-test		follow-up	
		Mean	SD	Mean	SD	Mean	SD
	the experiment						
Depression		13.06	2.120	12.93	1.032	12.93	2.491
Anxiety		12.53	1.922	12	1.511	11.06	1.830
Anxiety		14.13	2.065	13.06	1.830	12.93	1.830
	Control						
Depression		15.46	2.199	14.93	2.120	14.93	2.250
Anxiety		14	2.267	15.06	2.250	14.3	2.559
Stress		14.93	1.980	15.06	2.559	17.33	2.350

Covariance analysis was used to examine the significance of this difference, the results of which are visible in Table 3.

Using univariate analysis of covariance requires some basic assumptions, including normal distribution assumptions (Shapiro Wilk), variance homogeneity (Levin test) and homogeneity of regression

lines. Shapiro Wilk test results (sample size less than 30) showed that the scores were normal in two groups ($p > 0.05$).

Leven's test showed that there was no significant difference between the variances ($p > 0.05$).

The slope of the regression (the data of variables must show linearity) in the

dependent variables indicated that the regression lines are parallel.

The assumptions of multivariate analysis of covariance indicated that the data did not violate the assumption of matrix-

covariance homogeneity (post-test variance scores were not affected by pre-test) ($p > 0.05$). Therefore, as shown in table 3 it is permissible to use both univariate and multivariate covariance tests.

Table 4. Multivariate Covariance Analysis (MANCOVA) Results for Depression, Anxiety and Stress

Source of Changes	The dependent variable	SS	df	MS	F	P	Squared eta squared
Group (post-test)	Depression	6.827	1	6.827	7.350	0.012	0.227
	Anxiety	20.281	1	20.281	11.241	0.003	0.310
	Stress	8.397	1	8.397	6.888	0.015	0.216
Error	Depression	23.220	25	0.929			
	Anxiety	45.106	25	1.804			
	Stress	30.475	25	1.219			
Group (follow-up)	Depression	17.435	1	17.435	8.333	0.008	0.250
	Anxiety	7.867	1	7.867	4.319	0.048	0.147
	Stress	19.556	1	19.556	10.835	0.003	0.302
Error	Depression	52.307	25	2.092			
	Anxiety	45.532	25	1.821			
	Stress	45.122	25	1.805			

Conclusion

The aim of this study was to evaluate the effectiveness of mindfulness-based stress reduction on depression, anxiety and stress in women with gastroesophageal reflux disease. The results of data analysis showed that there is a significant difference between the control group and the group that received stress-based mindfulness training, which indicates a positive effect.

The results of this study are consistent with research (45, 46, 47, 48, 49, 50, 51, 52). Because limited research has been conducted in the field of mental health in patients with gastroesophageal reflux disease, this study can be called the first study in this field. Mental health is one of the most important aspects of health and

according to the definition of the World Health Organization "mental health lies in the general concept of health" means that the full capacity to perform social, mental and physical roles instead of illness and retardation (53).

Mental health refers to all the methods and measures used to prevent, treat, and rehabilitate mental illness (54). Explaining the relationship between gastroesophageal reflux disease and psychiatric symptoms, we can refer to the biological basis of this disorder and its relationship with issues such as depression, anxiety and stress.

The goal of treating gastroesophageal reflux disease is to eliminate the symptoms and improve the quality of life of the patients. Coping with illness takes a lot of effort. Many patients are unable to pursue

this adjustment effort, and their personal and interpersonal lives are at stake or undergoing serious changes. The increasing stress as well as the anxiety and depression that people sometimes experience, reduces their ability to cope with life's problems (55). Studies show that people with gastroesophageal reflux disease have anxiety disorders, psychosomatic disorders, social dysfunction, and depression (56).

Research has shown that anxiety and depression are associated with 2 to 4 times the risk of reflux (57). According to the present study and previous research, it can be said that there is a close relationship between nervous system health and gastrointestinal health. If the nervous system is strengthened, it will have a beneficial effect on the gastrointestinal tract. Also, the nervous system is affected by gastrointestinal energy. (For example, if the adrenaline is high, that is, in a state of anger and anxiety, the gastrointestinal tract receives less energy, and due to reduced energy intake from the nervous system, the function of the gastrointestinal tract also decreases) (58). So far, no direct relationship has been shown between the severity of GERD symptoms and the severity of pathology and mucosal damage, indicating the role of psychological factors in people's perception of GERD symptoms (59). It seems that the factor that leads to depression in patients with chronic pain such as gastroesophageal reflux disease is not the experience of pain, rather, patients' attitudes, beliefs and expectations about pain are more related to the degree of depression among them. Cognitive factors such as catastrophe, feelings of helplessness, patients' assessment of pain, control over it, interpretation of pain and

its consequences, and in general cognitive systems and pain-related beliefs are associated with depression (60). Given that psychological dimensions such as stress, anxiety and depression are phenomena arising from the interest in predicting the future and trying to maintain good events and prevent any stressful events in the process of life and that some people with GERD They do not have a good future, the progress of the disease increases his worries about the future every day. As a result, stress and anxiety overshadow what will happen tomorrow and thinking about it will lead to depression. Increases in the individual.

Mindfulness-based therapies have highly effective in treating some of the clinical disorders and physical illnesses (61).

Mindfulness includes reminders, but isn't related to memories. It includes reminders to refresh our awareness and knowledge of recent experiences in an intimate and comprehensible matter. This requires one to willfully give up the fiction and allow the full experience of the moment (62). Mindfulness describe five skills that include 1) mindfulness: not responding to inner experience; 2) paying attention to thoughts and feelings; 3) acting with an awareness; 4) describing and labeling inner experiences with words; and 5) not judging experience. Mindfulness is specifically taught through meditation techniques with sensory focus (63). Mindfulness is a potential for obvious attention. Also, mindfulness is paying attention to what is happening at the moment, regardless of whether that personal experience is negative, positive or neutral (64).

Teaching mindfulness through methods such as paying attention to breathing,

body, and focusing attention in the here and now, and influencing the cognitive system and information processing, increases people's awareness of the present and prevents them from thinking about the future. Applied to reduce stress, anxiety and depression. Given the importance of women's mental and physical health and their important and influential role in the health of other family members, and since the prevalence of gastroesophageal reflux disease causes more problems for women than men, pathological research should focus on this group. Limitations of this study include lack of control over features such as severity and duration of the disease, lack of use of men in the study and mismatch of the sample. Due to the increasing prevalence of gastric reflux in Iran and due to the relationship between psychological conditions such as stress and At the onset of the disease, it seems necessary to perform cognitive interventions along with conventional medical treatments, especially the intervention method. Mindfulness-based stress management for patients with this disorder should be performed in specialized clinics.

References

1. Nabil J. Awadalla. Personal, academic and stress correlates of gastroesophageal reflux disease among college students in southwestern Saudi Arabia: A cross-section study. *Annals of Medicine and Surgery*. Elsevier: 2019 Oct; 47 :61-65.
2. Lei Zhang, Lei Tu, Jie Chen, Jun Song, Tao Bai, Xue-Lian Xiang, et al. Health-related quality of life in gastroesophageal reflux patients with noncardiac chest pain: Emphasis on the role of psychological distress. *World J Gastroenterol*. 2017 Jan; 23(1): 127-134.
3. Richter JE, Rubenstein JH. Presentation and epidemiology of gastroesophageal reflux disease. *Gastroenterology* 2018;154:267-76.
4. Kahrazehi F, Shahabi S, Shirin Tarkeshdooz Z, Keshvari B. Comparing Profile of Mental Health and Strategies for Coping with Stress in Women with and without Gastroesophageal Reflux Disease. *Govareh* .2019;24:81-87. [persian]
5. Khan S, Orenstein SR. Gastroesophageal reflux disease. *Current and Future Developments in Surgery* volume 1: Oesophagogastric Surgery .2018;7:189-232.
6. Oor JE, Roks DJ, Ünlü Ç, Hazebroek EJ. Laparoscopic sleeve gastrectomy and gastroesophageal reflux disease: a systematic review and meta-analysis. *Am J Surg* 2016;211:250-67.
7. Herbella FA, Patti MG. Gastroesophageal reflux disease: From pathophysiology to treatment. *World J Gastroenterol* 2010;16:3745-9.
8. Martinucci I, Natilli M, Lorenzoni V, Pappalardo L, Monreale A, Turchetti G, et al. Gastroesophageal reflux symptoms among Italian university students: epidemiology and dietary correlates using automatically recorded transactions. *BMC Gastroenterol*. 2018;18:116.
9. El-Serag HB, Sweet S, Winchester CC, Dent J. Update on the epidemiology of gastro-oesophageal reflux disease: a systematic review. *Gut* 2014; 63: 871-880.
10. Mahmudi S, Pourshams A, Akbari M, Malekzadeh R. The prevalence of irritable bowel syndrome and gastroesophageal reflux disease among Tehran University students. *Govareh* .2012;8:159-62. [persian].
11. Hatami K, Pourshams A, Azimi K, Sarrafi M, Mehrabani M, Mostajabi P, et al. Dyspepsia, gastroesophageal reflux disease and irritable bowel syndrome

- among blood donors. Govaresh .2003;8:138-46 .[persian].
12. Manocha R, Black D, Sarris j, Stough C.A Randomized, Controlled Trial of Meditation for Work Stress, Anxiety and Depressed Mood in Full-Time Workers. *Evidence-Based Complementary and Alternative Medicine*.2011; 96:1-8.
 13. Kordmirza Nikoozadeh E. Effectiveness of Hardiness Training Intervention on Students' Perceived Stress and Psychological Hardiness. *IJABS*. 2020;7(2):58-66.
 14. Favoretto CA, Nunes YC, Macedo GC, Lopes JS, Quadros IM. Chronic social defeat stress: Impacts on ethanol-induced stimulation, corticosterone response, and brain monoamine levels. *Journal of Psychopharmacology*. 2020;34 (4):412-9.
 15. Eslick GD, Jones MP, Talley NJ. Non-cardiac chest pain: prevalence, risk factors, impact and consulting--a populationbased study. *Aliment Pharmacol Ther*. 2003; 17: 1115-1124.
 16. Verhaak PF.M, Heijmans MJ.W.M , Peters L, Rijken M. Chronic disease and mental disorder. *Social Science & Medicine*.2005; 60:789-797.
 17. Folkman S. *Stress: appraisal and coping*.2013; Springer. New York.
 18. Pustorino, S, Guerrisi O, Calipari G, Federico, G, Ianni, G, Scarpignato E.M, et al. (1991). Psycho-emotional distress and gastroesophageal reflux syndrome. *Minerva Gastroenterol Dietol*.1991; 37(1):1-9.
 19. Kamolz T, Velanovich V. Psychological and emotional aspects of gastroesophageal reflux disease. *Diseases of the esophagus*. 2002; 15:199-203.
 20. Choi JM, Yang JI, Kang SJ, Han YM, Lee J, Lee C, et al. Association between Anxiety and Depression and Gastroesophageal Reflux Disease: Results from a Large Cross-sectional Study. *J Neurogastroenterol Motil* 2018; 24:593-602.
 21. Biertho L, Sanjeev D, Sebahang H, Antony M, Anvar M. The influence of psychological factors on the outcomes of laparoscopic Nissen fundoplication. *Ann Surg Innov Res*. 2007.
 22. Hendri W. H, Spencer B. A, Gibson G. S. Organizational and extra organizational factors affecting stress, employee well-being, and absenteeism for males and females. *Journal of Business and Psychology*.1994; 9: 103–128.
 23. Rafiepoor A. The Role of Anticipation of Anxiety and Emotion Regulation among Adolescents with Internet Addiction. *IJABS*.2019;6(1):40-46.
 24. Ang CS, Chan NN, Lee CS. Shyness. Loneliness Avoidance, and Internet Addiction: What are the Relationships? *The Journal of psychology*. 2018 Jan;152(1):25-35.
 25. Chukhraev N, Vladimirov A, Zukow W, Chukhraiyeva O, Levkovskaya V. Combined physiotherapy of anxiety and depression disorders in dorsopathy patients. *Journal of Physical Education and Sport*. 2017;17(1):414.
 26. Kaplan H, Saduk B. *Synopsis of Clinical Psychiatry*. Translator. Rezei, Farzin. Tehran: Arjmand; 2015.
 27. Bassampour S.H. The effect of preoperative education on anxiety of patients undergoing open heart surgery. *Payesh Journal*.2004; 3(2):132-144. [Persian]
 28. Falahzadeh M, Ghafarikia H, Kaighobadi N, Saadati H. Compare of rates Depression, Anxiety and Stress in housewives and employed women in the city of Shiraz. *Journal of School of Public Health*. 2012; 13 (1): 123-115. [Persian].
 29. Hasanzadehtaheri M, Mogharab M, Akhbari S, Raeisoon M, Hasanzadehtaheri E. Prevalence of depression among new registered students in Birjand University of Medical Sciences in the academic.2009.[persian].

30. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5. Fifth edition. Arlington: 2013.
31. Azizi F, Hatami H, Janghorbani M. Epidemiology and control of prevalent disease in Iran .Tehran: Eshtiyagh. 2004. [Persian].
32. Alrashed AA, Aljammaz KI, Pathan A, Mandili AA, Almatrafi SA, Almotire MH, et al. Prevalence and risk factors of gastroesophageal reflux disease among Shaqra University students, Saudi Arabia. *J Family Med Prim Care* .2019;8:462-7.
33. Okuyama M, Takaishi O, Nakahara K, Iwakura N, Hasegawa T, Oyama M, et al. Associations among gastroesophageal reflux disease, psychological stress, and sleep disturbances in Japanese adults. *Scand J Gastroenterol* .2017; 52:44-9.
34. Chao L, Liu C, Sutthawongwadee S, Li Y, Lv W, Chen W, Yu L, et al. Effects of Probiotics on Depressive or Anxiety Variables in Healthy Participants Under Stress Conditions or With a Depressive or Anxiety Diagnosis: A Meta-Analysis of Randomized Controlled Trials. *Frontiers in Neurology* .2020 MAY;11(241):1-10.
35. Sohrabi Z, Dortaj F. The Effectiveness of Mindfulness Training on the Fear of Negative Evaluation and Automatic Thoughts in Female Students. *IJABS* .2020;7(1):11-23.
36. Oraki M, Ghorbani M. The Effectiveness of Mindfulness-Based Eating Awareness Training (MB-EAT) on Perceived Stress and Body Mass Index in Overweight Women. *IJABS* 2019;6(3):1-8.
37. Brown KW, Ryan RM. The benefits of being present: Mindfulness and its role in psychological wellbeing. *J of Perso and Soci Psycho* .2003; 84: 822-48.
38. Kabat-Zinn, J. Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness. New York, NY: Delta. 2013.
39. Whitebird RR, Kreitzer MJ, O'Connor PJ. Mindfulness- Based Stress Reduction and Diabetes. *Diabetes Spectr*.2009; 22: 226–230.
40. Bornemann B, Singer T. Taking time to feel our body: steady increases in heartbeat perception accuracy and decreases in alexithymia over 9 months of contemplative mental training. *Psychophysiology* .2017;54(3):469-82.
41. Townshend K, Jordan Z, Stephenson M, Tsey K. The effectiveness of mindful parenting programs in promoting parents' and children's wellbeing: a systematic review. *JB database of systematic reviews and implementation reports* .2016;14(3):139-80.
42. Potek R. Mindfulness as a school-based prevention program and its effect on adolescent stress, anxiety and emotion regulation. New York University. 2012.
43. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd ed. Sydney: Psychology Foundation. (Available from The Psychology Foundation, Room 1005 Mathews Building, University of New South Wales, NSW 2052, Australia). 1995.
44. Salehi A. A symptom profile analysis of depression in a sample of Iranian patients. *Iranian Journal of Medical Sciences* .2013;38(1):22-29.
45. Dehestani M. The effectiveness of mindfulness-based stress reduction program on depression, anxiety and depression of female students. *Thought & Behavior in Clinical Psychology* 2015;37(9):37-46.
46. AghaUsefi A, Oraki M, Zare M, Imani S. Effectiveness of Mindfulness in Decreasing Stress, Anxiety and Depression among the Substance Abuser. *Thought & Behavior in Clinical Psychology* .2013;26(7):17-26.
47. Kharatzadeh H, Davazdah Emamy M, Bakhtiari M, Kachuei A, Mahaki B. Effectiveness of Mindfulness Based Stress Reduction on Glycemic Control , Stress , Anxiety and Depression on Patients with Type 2 Diabetes

- Mellitus. The Journal of Urmia University of Medical Sciences , 2017;28(3):206-214.
48. Vala M ,Razmandeh R.Rambod K,Nasli Esfahani E,Ghodsi Ghasemabadi R. Mindfulness-based Stress Reduction Group Training on Depression, Anxiety, Stress, Self-confidence and Hemoglobin A1c in Young Women with Type 2 Diabetes. Iranian Journal of Endocrinology and Metabolism, 2015 Dec-Jun;17(5):382-390.
49. Farhadi, M.Pasandideh, M M. Effectiveness of Mindfulness-Based Cognitive Therapy Stress, anxiety and depression and increased self-efficacy in patients With multiple sclerosis. Biannual Journal of Clinical Psychology & Personality. 2017;15(2):7-15.[persian].
50. Masumian S, Golzar M, Shairi MR, Momenzadeh S. The effect of mindfulness-based stress reduction on the rate of depression in patients with chronic low back pain. Anesthesiology and Pain Official Journal of ISRAPM. 2013;3(2):82-87.
51. Kriakous S .A, Elliott K.A, Lamers C , Owen R. The Effectiveness of Mindfulness-Based Stress Reduction on the Psychological Functioning of Healthcare Professionals: a Systematic Review. Springer Science+Business Media, LLC part of Springer Nature 2020.(published online 24 september 2020).
52. Marciniak R, Šumec R, Vyhnálek M, Bendíčková K, Lázničková P, et al. The Effect of Mindfulness-Based Stress Reduction (MBSR) on Depression, Cognition, and Immunity in Mild Cognitive Impairment: A Pilot Feasibility .Clinical Interventions in Aging. 2020;15: 1365–1381.
53. Robinson P, Turk D, Jilka S, Cella M. Measuring attitudes towards mental health using social media: investigating stigma and trivialisation. Soc Psychiatry Psychiatr Epidemiol 2019;54:51-8.
54. Roe D, Corrigan P, Link BG. Mental Health Stigma: so much progress and yet a long way to go-Introduction to special issue on stigma. Isr J Psychiatry Relat Sci 2017; 54:3-5.
55. 10. Javanmard, G. H. Psychopathology 2. Tehran: Payamenoor University Publication. 2008; [Persian].
56. Aletaha N, Pourshams A, Nouraei S, Malekzadeh R. The Role of Psychosocial Disorders in Gastroesophageal Reflux Disease. Govareh 2007;12:92-7.[persian].
57. Rathi P, Gill A, Vankar GK, Ohri N, Patel A. Study of Depression and Anxiety in Endoscopically Diagnosed Cases of Gastro-Oesophageal Reflux Disease (GERD). Indian J Mental Health 2018;5:15-28.
58. Choi JM, Yang JI, Kang SJ, Han YM, Lee J, Lee C, et al. Association between Anxiety and Depression and Gastroesophageal Reflux Disease: Results from a Large Cross-sectional Study. J Neurogastroenterol Motil 2018;24:593-602.
59. Kamolz T, Granderath FA, Pointner R. Does major depression in patients with gastroesophageal reflux disease affect the outcome of laparoscopic antireflux surgery? Surg Endosc 2003;17:55-60.
60. Gatchel RJ, Fuchs PN, Peters ML, BoPeng Y. The Biopsychosocial Approach to Chronic Pain: Scientific advances and future directions. Psychol Bull 2007; 133(4): 581-624.
61. Baer RA. Mindfulness-based treatment approaches: Clinician's guide to evidence base and applications: Elsevier; 2015.
62. Germer C, Siegel RD, Fulton PR. Mindfulness and psychotherapy: Guilford Publications; 2016.
63. Creswell JD. Mindfulness interventions. Annual review of psychology. 2017;68:491-516.

64. Creswell JD, Lindsay EK. How does mindfulness training affect health? A mindfulness stress buffering account. *Current Directions in Psychological Science*. 2014;23(6):401-7.