

Comparison of the Effectiveness of Autogenic Training with Affect Regulation Training on Psychological Adjustment of Women with type 2 Diabetes

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Abstract

Objective: Diabetes is a chronic disease that has negative physical and psychological consequences and effective interventions are necessary to reduce these consequences. Therefore, this study aimed to compare the Autogenic training (AT) and Affect regulation training (ART) on the psychological adjustment of women with type 2 diabetes.

Method: Among female patients with type 2 diabetes referred to the Iranian Endocrine Institute, 33 patients were selected by convenience sampling and randomly divided into three groups (AT, ART, and control). Participants answered the Psychosocial Adjustment to Illness Scale (PAIS-SR) before and at the end of the intervention. The subjects of ART and AT groups underwent 10 90-minute training sessions and the control group did not receive any intervention.

Results: Data analysis with MANOVA and ANOVA showed that psychosocial adjustment to disease in both ART and AT groups was significantly improved compared to the control group ($P < 0.05$). The two groups of AT and ART were not significantly different in improving psychosocial adjustment to disease ($P > 0.05$).

Conclusion: It seems that both interventions, AT and ART, have been effective in improving the psychological adjustment of women with type 2 diabetes by affecting the mechanisms of mind-body communication.

Keywords: Diabetes, affect regulation, autogenic training, psychological adjustment, women.

Introduction

Diabetes has affected the lives of more than 4.2 million people worldwide (Gredig, & Bartelsen-Raemy, 2017). It is a metabolic disorder characterized by high blood sugar due to impaired insulin secretion, defective insulin function, or both (Thapa, Pyakurel, Baral, & Jha, 2019). Diabetes has become one of the main causes of cardiovascular disease,

blindness, kidney failure, and death throughout the world. Type 2 diabetes is also the most common metabolic disease in which environmental factors such as obesity, sedentary lifestyle, poor nutrition, and genetic factors play a role in its occurrence and exacerbation (Wegeberg, et al, 2019). By 2035, it will affect approximately 600 million people worldwide (Nanayakkara et al., 2018). Patients with type 2 diabetes suffer from psychological and social health problems (Lee, 2019) and this requires adaptation to the disease. The goal is to adapt, manage, or prevent anxiety from a potentially threatening situation (Gåfvels, & Wändell, 2006). Mastering diabetes and its adverse consequences, accepting oneself as a

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person with a chronic illness, and having a positive attitude toward the future can facilitate coping with the disease (Gois, Ferro, Santos, Sousa, Ouakinin, Do Carmo, & Barbosa, 2012). People with diabetes are constantly challenged with the stressful demands associated with the disease and must use a variety of methods to cope with the disease (Owens-Gary, Zhang, Jawanda, Bullard, Allweiss, & Smith, 2019). Studies show that people with chronic illnesses are more likely than others to use relaxation techniques and other mental-physical techniques to cope with the illness (Asuzu, Walker, Williams, & Egede, 2017).

Autogenic training (AT) training is one of these methods, a standard relaxation technique developed by Schultz in 1930 to manage stress (Stetter, & Kupper, 2002). Autogenic training from the mental repetition of six regular exercises (heaviness, warmth, regular and calm heart function, breathing regulation, warmth in the upper abdomen, and acceptable forehead cooling) is designed to make general communication of the organism (Stanton, & Meston, 2015). Doing these exercises frequently helps to increase a person's endurance capacity to experience deeper relaxation and response therapy (Seo, Hong, Choi, Kim, Brandt, & Im, 2018). In contrast to the stress response, the mechanism of action of this relaxation technique lies in the relaxation response, which involves a complex interaction of the endocrine, immune, neural, and psychological systems (Kiba et al., 2017). Ramirez-Garcia, & et al. (2020) in a study systematically reviewed studies on the effectiveness of AT on the mental health of patients with chronic diseases and showed that AT is effective in improving the psychological well-being and quality of life of these patients. Also, Cavallaro (2020) in his study aimed at the effectiveness of AT in dialysis patients found that psychological symptoms such as anxiety, depression, and distress were reduced by using this intervention. Meditation exercises reduce stress in people with type 2 diabetes, and therefore stress-based mental exercises

can increase psychological and social adjustment (Sakai, S., Inoue-Sato, Amemiya, Murakami, Inagaki, & Sakairi, 2020). Wijayanti, Setiawan, & Wardani (2020) compared the effectiveness of AT and sandalwood aromatherapy on hypertension in hypertensive elderly and found no difference between the two interventions and considered both treatments effective. Takaishi (2000) found in his study that AT was significantly more effective than progressive relaxation in reducing arousal in anxiety disorders.

Although AT can be used as a technique in psychotherapy (Labbé, & Williamson, 1984), there is ample evidence that AT is essentially a relaxation technique (Abuín, 2016), and some believe that it is not as effective as other psychiatric interventions. People who struggle with chronic physical problems suffer from psychological disorders and negative emotions (Rezaei et al., 2019; Dickens, Cherrington, & McGowan, 2012; Watts, Leydon, Birch, Prescott, Lai, Eardley, & Lewith, 2014). Therefore, it seems that the ability to perceive, recognize, accept, and regulate negative emotions can play an important role in health and well-being. However, many people do not have these skills (Berking, & Whitley, 2014). Affect regulation training (ART) is designed to develop emotion regulation skills in people who suffer from mental disorders or want to learn how to cope with their challenging emotions in everyday life (Berking, & Whitley, 2014). This approach includes seven skills: muscle relaxation, respiratory relaxation, non-judgmental awareness, acceptance and tolerance, compassionate self-support, emotion analysis, and emotion modulation (Berking, & Whitley, 2014). Empirical evidence suggests that defects in affect regulation contribute to the onset and persistence of a wide range of mental disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Trinidad, & Johnson, 2002; Jazaieri, Urry, & Gross, 2013). Based on these findings, it can be assumed that many mental disorders and adjustment problems are successfully cured using emotion-

based interventions (Berking, Orth, Wupperman, Meier, & Caspar, 2008). For example, Berking et al. (2019) found that emotion regulation training was associated with a reduction in depressive symptoms. Wing, Epstein, Nowalk, & Lamparski (1986) also found that affect regulation training is effective in improving affect regulation and blood sugar control strategies in diabetic patients. Compared with muscle relaxation methods, Mohammadi & Ahmadi (2018) found that progressive relaxation intervention is more effective than affect regulation. Berking, & Whitley (2014) also showed that enriching cognitive-behavioral therapy with affect regulation training has more effect on mental health and improving depression than traditional cognitive-behavioral therapy. However, the evidence from previous studies to reduce the severity of mental and physical disorders in this area is still preliminary (Berking et al., 2019).

Therefore, considering the role of diabetes in quality of life and its destructive effects on psychological adjustment, emotions, and feelings, it seems necessary to find optimal and practical therapeutic intervention. The need to evaluate the therapeutic effect of AT and ART is doubled due to the lack of research or conflicting findings. Therefore, this study aimed to compare the effectiveness of AT and ART on the psychological adjustment of type 2 diabetic women.

Method

The present study was a quasi-experimental with pretest-posttest and control group. For this purpose, among all female patients with type 2 diabetes who were referred to the Iranian Endocrine Institute, 33 patients were selected by convenience sampling method and randomly divided into three groups of intervention (AT and ART) and control were assigned (11 people in each group). All participants answered the Psychosocial Adjustment Questionnaire (PAIS) before and after the intervention. ART and AT group participants participated in 10 90-minute training

sessions. The interventions were performed by a trained psychologist under a supervisor. The data obtained with SPSS-24 software were statistically analyzed at both descriptive and inferential levels.

Ethical statement

All subjects provided written informed consent prior to their inclusion in the study. The participants were briefly explained about the study process and its goals and also assured of the confidentiality of their personal information. It should be noted that the present article is taken from Islamic Azad University, Research Sciences Branch, which was approved by the research ethics committees with code IR.IAU.SRB.REC.1398.144.

Research instruments

Psychosocial Adjustment to Illness Scale (PAIS-SR; Drogatis, 1986): PAIS-SR evaluates the psychosocial adjustment process of a person with a health condition and/or its consequences and has versions for patients and carers. The scale has 46 items with Likert-type answers grouped under a total of seven domains (Health Care Orientation, Vocational Environment, Domestic Environment, Sexual Relationships, Extended Family Relationships, Social Environment, and Psychological Distress). The sum of the total scores is divided by the number of questions and the total average is considered as the overall consistency score. In the study of Drogatis (1986), the reliability obtained from Cronbach's alpha in the subscales of this questionnaire was obtained from 0.47 to 0.85. The construct validity of this questionnaire using exploratory factor analysis showed that these seven subscales explained a total of 0.63 of the total variance of the scale. In a study in Iran, confirmed the face validity of the questionnaire by 10 professors and its reliability in a sample of 20 people with diabetes was obtained 0.94 (Aflakseir, Raoofi, Mollazadeh, Khormaei, & Farmani, 2015). *Affect regulation training (ART)*: ART (Berking, & Whitley, 2014) is a 90-minute, 10-week program

translated by Agah Harris and Mirza Mohammad Alaini that its contents are presented in Table 1.

2 Associate's degrees, 8 bachelor's degrees, and 6 master's degrees. There were also 15 employees, 2

Table1: Affect regulation training Protocol (ART)

Sessions	Outline of session
First session	Introducing the mind-body relationship and the pattern of chronic physical diseases
Second session	Psychological training: The nature of the functions of affect or emotion
Third session	First and second skills: muscle relaxation training with breathing regulation
Fourth session	Psychological education: the importance of practicing emotional regulation
Fifth session	Third skill: training awareness without judgment
Sixth session	Fourth skill: training to accept and tolerate emotions
Seventh session	Fifth skill: training compassionate self-support (with compassion)
Eighth session	Sixth skill: emotion analysis training
Ninth session	Seventh skill: training to adjust and correct emotions
Tenth session	More coping exercises on emotional states

Autogenic training (AT): AT (Sadigh, 2001) is a 90-minute, 10-week program translated by Agah Harris and Mirza Mohammad Alaini based on the book "Autogenic Training: A Mind-Body Approach". The outline of each session is presented in Table 2.

teachers, 7 hairdressers, and 9 housewives.

Table 3 describes the descriptive characteristics of psychosocial adjustment scores with the disease and its subscales in two stages of pre-test and post-test and three groups of ART, AT, and control. As can be seen, the mean scores of psychosocial adjustment to

Table2: Autogenic training protocol (AT)

Sessions	Content of session
First session	Stress and chronic diseases, Autogenic training, Relaxation postures, Passive focus, Mental connection with a specific function or part of the body, Repetition of specific phrases, Daily exercise
Second session	First Preliminary Exercise
Third session	The second introductory exercise
fourth Session	The first standard exercise: weight
fifth meeting	The second standard exercise: heat
Sixth Session	The third standard exercise: the heart
Seventh session	The fourth standard exercise: breathing
Eighth Session	Fifth Standard Exercise: Abdominal Heat
Ninth session	Sixth standard exercise: forehead coolness
Tenth session	Advanced autogenic training

Results

The results showed that the average age of the subjects was 48 years with an age range of 46 to 53 years. The mean duration of diabetes was 33 months with a standard deviation of 18 months and ranged from 10 to 96 months. Out of 33 subjects, the subjects' education was as follows: 17 diplomas,

illness in the post-test compared to the pre-test in the groups of AT and ART improved, but in the group control of these values has not changed significantly. MANOVA was used to analyze the data. Before analysis, some of the most important assumptions of this test, including the normality of data distribution related to dependent variables using

the Kolmogorov-Smirnov test, the homogeneity of variance-covariance matrices using the M-box test, and the homogeneity of variance errors using the Levene's test were examined. To determine the significance of the effect of the independent variable (group) on dependent variables, Pillai's trace was used (Table 4).

in the effect of subscales of psychosocial adjustment with illness scores in two stages of pre-test, post-test according to the ART, AT, and control groups ($P < 0.05$), with the effect size of 64.7% (Table4).

Table 5 shows the ANOVA results for examining the difference between the mean scores of the

Table3: Descriptive characteristics of psychosocial adjustment to illness scores in groups

Variables	groups	Pre-test		Post-test	
		M	SD	M	SD
Health care	ART	12.18	4.30	5.63	2.97
	AT	10.27	3.84	4.45	2.38
	Control	9.18	4.16	10.09	0.54
Vocational Environment	ART	58.66	7.36	65.25	4.39
	AT	53.00	4.95	64.41	4.12
	Control	56.08	13.39	53.33	12.94
Domestic Environment	ART	9.72	4.17	5.09	2.98
	AT	8.54	2.87	3.81	2.04
	Control	7.18	3.12	8.54	3.29
Sexual Relationships	ART	6.18	2.96	2.45	3.38
	AT	6.18	1.88	2.54	2.62
	Control	7.27	2.37	7.72	2.37
Extended Family Relationships	ART	3.72	1.27	0.36	0.50
	AT	4.09	2.77	0.63	0.80
	Control	2.90	2.30	3.27	2.32
Social Environment	ART	6.18	2.44	1.18	1.66
	AT	4.90	2.46	1.09	2.07
	Control	4.81	3.18	4.45	3.55
Psychological distress	ART	8.27	3.52	3.18	1.99
	AT	5.90	2.73	2.45	1.50
	Control	6.36	3.32	7.72	3.84
psychosocial adjustment to illness	ART	51.18	13.22	18.72	8.59
	AT	45.90	8.81	16.00	6.75
	Control	41.18	11.71	46.72	13.84

Table4: Results of MANOVA comparing groups in the stages of measuring psychosocial adjustment

Impact	Variable	Value	F	Df1	Df2	P	Effect size
Group	Subscales of psychosocial adjustment	1.29	6.53	14.000	50.000	0.001	0.647
Group	Total scores of psychosocial adjustment	0.82	11.44	4.00	66.00	0.0001	0.41

The results of Pillai's trace show significant changes

psychosocial adjustment to the disease based on

intergroup and intragroup effects. The results of the ANOVA test showed significant changes in the subscale of the psychosocial adjustment in two stages of pre-test and post-test and ART, AT, and control groups ($P < 0.05$). The effect of these changes is 74.2%, 74.1%, 62.7%, 80.7%, 56.7%, 78.8%, and 68.1% for health care, vocational environment, domestic environment sexual relationships, extended family relationships, social environment, and psychological distress, respectively.

on muscle relaxation, including AT (Cavallaro, 2020; Ramirez-Garcia et al., 2020; Wijayanti et al., 2020) and ART (Berking et al., 2014; Wing et al., 1986; Berking et al., 2019) on quality of life, mental health, and adjustment to chronic diseases.

In explaining this conclusion, it can be said that patients with diabetes are constantly challenged by the stressful demands specific to this disease (Wegeberg et al., 2019), which can result in dysfunction in physical and psychological dimensions (Nanayakkara et

Table 5. Results of ANOVA comparing the scores of psychosocial adjustment

Variable	SS	df	MS	F	P	η^2
Health care	371.63	2	185.81	43.12	0.0001	0.742
Vocational environment	161.15	2	80.57	43.02	0.0001	0.741
Domestic environment	268.06	2	134.03	25.24	0.0001	0.627
Sexual relationships	147.15	2	73.57	62.90	0.0001	0.807
Extended Family Relationships	104.42	2	52.21	19.62	0.0001	0.567
Social Environment	194.36	2	97.18	55.87	0.0001	0.788
Psychological distress	247.69	2	123.84	31.98	0.0001	0.681
Total scores of psychosocial adjustment	9927.51	2	4963.75	136.32	0.0001	0.901

The results of Scheffe' and Tukey tests for pairwise comparison of the difference between the mean scores of the subscales of psychosocial adjustment to the disease in the pre-test and post-test separately in the three ART, AT and control groups indicate a significant difference in the mean subscale scores. Psychosocial adaptation to the disease in the two intervention groups compared to the control group ($P < 0.05$). The difference in scores in the comparison between AT and ART was not significant ($P < 0.05$). In other words, psychosocial adjustment to the disease improved in the ART and AT groups.

Discussion and conclusion

The results showed that the difference in scores of psychosocial adjustment to disease in the ART group was significant compared to the control group. But these changes were not significant in comparison with the AT group and ART group. Therefore, it can be concluded that psychosocial adjustment to disease has improved in the intervention groups compared to the control group. Almost all previous studies have shown the effectiveness of both interventions based

al., 2018). Therefore, high levels of stress in these patients reduce adjustment to the disease. Relaxation training seems to be an optimal strategy for stress management (Mohammadi, & Ahmadi, 2018). AT is a standard relaxation technique performed using the mental repetition of six regular exercises (weight, warmth, slow and regular heart function, breathing regulation, warmth in the upper abdomen, and forehead cooling) (Stanton, & Meston, 2017). The mechanism of action of relaxation involves a complex interaction of the endocrine, immune, neurological and psychological systems (Seo et al., 2018), which increase the individual's capacity to experience deep relaxation and therapeutic benefits (Stanton, & Meston, 2017). The proposed formula in AT emphasizes psychological relaxation at each stage. During practice, clients are encouraged to passively focus and simply follow the therapist's recommendations without trying to change them (Takaishi, 2020). Therefore, AT can be a promising treatment for improving psychological well-being and quality of life in people with chronic physical

problems. People with one or more chronic health problems, the use of relaxation techniques such as AT can facilitate their improvement (Kiba et al, 2017).

Another advantage of AT over other methods is that in this method, the focal points for reducing the level of arousal are not limited to the muscular system, but also emphasize the relaxation of the mental state and the autonomic nervous system, such as heat in the limbs. (Takaishi, 2020). While AT exercises are performed, most people experience passive concentration, which allows them to overcome the vicious cycle of stress (Ramirez-Garcia et al, 2020). AT also direct the sympathetic system arousal to parasympathetic activation by relaxation (Lim, & Kim, 2014). AT also reduces the patient's anxiety level by creating mental energy for positive self-image and a sense of self-efficacy (Lim and Kim, 2014).

In general, it can be said that muscle relaxation through a regular set of physiological changes leads to a decrease in oxygen consumption, heart rate, respiration, and blood lactate, which together indicate a reduction in anxiety symptoms in a person. Besides, muscle relaxation helps to increase the efficiency of inner potential, including the power of reason and creativity, by strengthening mental strength and increasing self-confidence. At the physiological level, this method creates a balance between the activity of the posterior and anterior hypothalamus, and as a result, prevents the complications of anxiety and leads to increased adaptation (Stanton, & Meston, 2017).

On the other hand, one of the important components that play a role in self-care behaviors is affecting regulation (Trinidad, & Johnson, 2002). Exercises used to affect regulation training include accepting emotion tolerance, analyzing emotions, and modifying and modifying them (Berking, & Whitley, 2014). Thus, emotion regulation training can help psychological adjustment by modifying what emotion a person experiences, when, and how.

In explaining this issue, it can be said that emotions play an important role in adapting to stressful events (Gross, & Jazaieri, 2014). The main goal of emotion regulation is to achieve mental well-being by increasing positive emotions and reducing negative emotions (Gross, & Jazaieri, 2014). Deficiency in these skills can lead to psychological problems in at least two ways. First, excessive, prolonged, and unfavorable emotional states are the main criteria for various mental disorders (Diagnostic and Statistical Manual of Mental Disorders, 2013), and second, many cognitive and behavioral symptoms of psychological disorders can be Defined as inconsistent attempts to regulate unpleasant emotions (Berking et al., 2019).

Emotion regulation training leads to the prevention and treatment of physical and psychological effects of negative emotions by improving emotion regulation skills (Berking et al., 2019). The individual's ability to identify emotions facilitates the process of increasing the power to assess environmental stimuli, establish emotional relationships, and express empathy, thereby enabling a person to interact constructively with the environment (Mohammadi, & Ahmadi, 2018). Regulation of emotion increases resilience by increasing the perceptual power of the environment. Also, one of the effects of emotion regulation training is the ability to identify and distinguish positive and negative emotions, which causes people to reduce their negative emotions and improve their positive emotions by becoming proficient in managing emotions (Aldao et al, 2010), this, in turn, leads to increased adaptation. Therefore, it can be concluded that both of these interventions, by reducing stress and increasing self-regulation, facilitate the adjustment process of patients with diabetes.

On the other hand, adaptation is considered as continuous cognitive and behavioral changes to manage external and internal demands that go beyond one's possibilities (Aldao et al, 2010); At the same time, emotion regulation also refers to efforts

that help the person to experience what emotion, when and how (Jazayeri et al., 2013). Deficiency in these skills can lead to psychological problems in at least two ways. First, excessive, prolonged, and unfavorable emotional states are the main criteria for various mental disorders (Diagnostic and Statistical Manual of Mental Disorders, 2013), and second, many cognitive and behavioral symptoms of psychological disorders can be Defined as inconsistent attempts to regulate unpleasant emotions (Berking et al., 2019). Emotion regulation training to improve emotion self-regulation skills leads to the prevention and treatment of problems related to emotion regulation (Berking et al., 2014). Although both of these therapies lead to an increased psychological adjustment to the disease, emotion regulation intervention, in contrast to AT therapy, it enhances the ability to assess environmental stimuli by empowering individuals to identify inner emotions. Establish emotional relationships and express empathy, thereby enabling a person to interact constructively with the environment (Labbé, & Williamson, 1984). On the other hand, according to 35 randomized controlled trials evaluating medical and psychiatric interventions, AT has been found to have the fewest side effects compared to other psychological methods (Goldbeck, & Schmid, 2003); People who practice spontaneous stress relief for 15 to 20 minutes a day regularly report more balanced emotional states, adjustment skills, better sleep quality, and reduced anxiety levels (Gois et al, 2012). Thus, deep muscle relaxation - the main skill taught in the treatment of spontaneous stress relief - reverses the “attack or flight” response, which leads to a maximum reduction in heart rate and blood pressure. In such conditions, the dominance of the parasympathetic system is complete (Gross, & Jazaieri, 2014). Therefore, both of these therapies, by including their mechanisms, contribute to psychological adaptation to the disease. The present study has limitations. For example, sampling was selected in a non-random and accessible

manner and as a result, there is a possibility of some annoying variables. Also, the long-term effects of AT and ART interventions were not studied. The statistical population also included only women with type 2 diabetes and therefore caution should be exercised in extending these results to other diabetic patients as well as other chronic diseases. Therefore, future researchers are suggested to repeat the results of the present study in other societies with more controlled conditions in future studies, and also therapists and the medical system to use these interventions to help diabetic patients.

References

- Abuin, M. R. (2016). Terapia autógena: técnicas, fundamentos, aplicaciones en la salud y clínica y apoyo empírico. *Clínica y Salud*, 27(3), 133-145.
- Aflakseir, A., Raoofi, S., Mollazadeh, J., Khormaei, F., & Farmani, A. (2015). Prediction of psychosocial adjustment to illness based on health locus of control dimensions in type 2 diabetic patients. *Iranian Journal of Diabetes and Metabolism*, 14(5), 337-344.
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, 30(2), 217-237.
- Asuzu, C. C., Walker, R. J., Williams, J. S., & Egede, L. E. (2017). Pathways for the relationship between diabetes distress, depression, fatalism and glycemic control in adults with type 2 diabetes. *Journal of Diabetes and its Complications*, 31(1), 169-174.
- Berking, M., & Whitley, B. (2014). Emotion regulation: Definition and relevance for mental health. In *Affect Regulation Training* (pp. 5-17). Springer, New York, NY.
- Berking, M., Eichler, E., Luhmann, M., Diedrich, A., Hiller, W., & Rief, W. (2019). Affect regulation training reduces symptom severity in depression—A randomized controlled trial. *PloS one*, 14(8), e0220436.
- Berking, M., Orth, U., Wupperman, P., Meier, L. L., & Caspar, F. (2008). Prospective effects of emotion-regulation skills on emotional adjustment. *Journal*

- of Counseling Psychology*, 55(4), 485.
- Cavallaro, M. F. (2020). The autogenic training on dialysis as a mental place of serenity and well being. *Journal of Clinical & Developmental Psychology*, 2(2).
- Derogatis, L. R. (1986). The psychosocial adjustment to illness scale (PAIS). *Journal of psychosomatic research*, 30(1), 77-91.
- Dickens, C., Cherrington, A., & McGowan, L. (2012). Depression and health-related quality of life in people with coronary heart disease: a systematic review. *European Journal of Cardiovascular Nursing*, 11(3), 265-275.
- Edition, F. (2013). Diagnostic and statistical manual of mental disorders. *Am Psychiatric Assoc.*
- Gåfvæls, C., & Wändell, P. E. (2006). Coping strategies in men and women with type 2 diabetes in Swedish primary care. *Diabetes research and clinical practice*, 71(3), 280-289.
- Gois, C. J., Ferro, A. C., Santos, A. L., Sousa, F. P., Ouakinin, S. R., Do Carmo, I., & Barbosa, A. F. (2012). Psychological adjustment to diabetes mellitus: highlighting self-integration and self-regulation. *Acta diabetologica*, 49(1), 33-40.
- Goldbeck, L., & Schmid, K. (2003). Effectiveness of autogenic relaxation training on children and adolescents with behavioral and emotional problems. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(9), 1046-1054.
- Gredig, D., & Bartelsen-Raemy, A. (2017). Diabetes-related stigma affects the quality of life of people living with diabetes mellitus in Switzerland: implications for healthcare providers. *Health & social care in the community*, 25(5), 1620-1633.
- Gross, J. J., & Jazaieri, H. (2014). Emotion, emotion regulation, and psychopathology: An affective science perspective. *Clinical Psychological Science*, 2(4), 387-401.
- Jazaieri, H., Urry, H. L., & Gross, J. J. (2013). Affective disturbance and psychopathology: an emotion regulation perspective. *Journal of Experimental Psychopathology*, 4, 584-599.
- Kiba, T., Abe, T., Kanbara, K., Kato, F., Kawashima, S., Saka, Y., ... & Fukunaga, M. (2017). The relationship between salivary amylase and the physical and psychological changes elicited by continuation of autogenic training in patients with functional somatic syndrome. *BioPsychoSocial medicine*, 11(1), 1-11.
- Labbé, É. L., & Williamson, D. A. (1984). Treatment of childhood migraine using autogenic feedback training. *Journal of consulting and clinical psychology*, 52(6), 968.
- Lee, K. W. (2019). Distinguishing user's different fingers on touch screen: method, application and user acceptance assessment. *Journal of Industrial and Production Engineering*, 36(1), 1-12.
- Lim, S. J., & Kim, C. (2014). Effects of autogenic training on stress response and heart rate variability in nursing students. *Asian nursing research*, 8(4), 286-292.
- Mohammadi, S. Y., & Ahmadi, S. (2018). Effectiveness of progressive relaxation and emotional regulation on quality of life of heart patients. *The Journal of Qazvin University of Medical Sciences*, 22(5), 59-69.
- Nanayakkara, N., Pease, A., Ranasinha, S., Wischer, N., Andrikopoulos, S., Speight, J., ... & Zoungas, S. (2018). Depression and diabetes distress in adults with type 2 diabetes: results from the Australian National Diabetes Audit (ANDA) 2016. *Scientific reports*, 8(1), 1-10.
- Owens-Gary, M. D., Zhang, X., Jawanda, S., Bullard, K. M., Allweiss, P., & Smith, B. D. (2019). The importance of addressing depression and diabetes distress in adults with type 2 diabetes. *Journal of general internal medicine*, 34(2), 320-324.
- Ramirez-Garcia, M. P., Leclerc-Loiselle, J., Genest, C., Lussier, R., & Dehghan, G. (2020). Effectiveness of autogenic training on psychological well-being and quality of life in adults living with chronic physical health problems: a protocol for a systematic review of RCT. *Systematic reviews*, 9, 1-8.
- Rezaei, S., Ahmadi, S., Rahmati, J., Hosseini-fard, H., Dehnad, A., Aryankhesal, A., ... & Raoofi, S. (2019). Global prevalence of depression in HIV/AIDS: a systematic review and meta-analysis. *BMJ supportive & palliative care*, 9(4), 404-412.
- Sadigh, M. R., & Montero, R. P. (2001). Autogenic training: a mind-body approach to the treatment of fibromyalgia and chronic pain syndrome. CRC Press.
- Sakai, S., Inoue-Sato, M., Amemiya, R., Murakami, M.,

- Inagaki, K., & Sakairi, Y. (2020). The influence of autogenic training on the physical properties of skin and cardiac autonomic activity in postmenopausal women: an exploratory study. *International Journal of Dermatology*, 59(1), 103-109.
- Seo, E., Hong, E., Choi, J., Kim, Y., Brandt, C., & Im, S. (2018). Effectiveness of autogenic training on headache: A systematic review. *Complementary therapies in medicine*, 39, 62-67.
- Stetter, F., & Kupper, S. (2002). Autogenic training: a meta-analysis of clinical outcome studies. *Applied psychophysiology and biofeedback*, 27(1), 45-98.
- Stanton, A., & Meston, C. (2017). A single session of autogenic training increases acute subjective and physiological sexual arousal in sexually functional women. *Journal of sex & marital therapy*, 43(7), 601-617.
- Takaishi, N. (2000). A comparative study of autogenic training and progressive relaxation as methods for teaching clients to relax. *Sleep and Hypnosis*, 2(3), 132-136.
- Thapa, S., Pyakurel, P., Baral, D. D., & Jha, N. (2019). Health-related quality of life among people living with type 2 diabetes: a community based cross-sectional study in rural Nepal. *BMC public health*, 19(1), 1171-1180.
- Trinidad, D. R., & Johnson, C. A. (2002). The association between emotional intelligence and early adolescent tobacco and alcohol use. *Personality and individual differences*, 32(1), 95-105.
- Watts, S., Leydon, G., Birch, B., Prescott, P., Lai, L., Eardley, S., & Lewith, G. (2014). Depression and anxiety in prostate cancer: a systematic review and meta-analysis of prevalence rates. *BMJ open*, 4(3).
- Wegeberg, A. M. L., Meldgaard, T., Hyldahl, S., Jakobsen, P. E., Drewes, A. M., Brock, B., & Brock, C. (2019). Quantities of comorbidities affects physical, but not mental health related quality of life in type 1 diabetes with confirmed polyneuropathy. *World Journal of Diabetes*, 10(2), 87.
- Wijayanti, L., Setiawan, A. H., & Wardani, E. M. (2020). The Effect Of Autogenic Relaxation and Aroma Therapy of Sandalwood on Blood Pressure in Elderly Hipertension. *Jurnal Keperawatan*, 12(3), 413-420.
- Wing, R. R., Epstein, L. H., Nowalk, M. P., & Lamparski, D. M. (1986). Behavioral self-regulation in the treatment of patients with diabetes mellitus. *Psychological Bulletin*, 99(1), 78.

Coronavirus Anxiety: The Predictive Role of Perfectionism

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Abstract

Objective: The Coronavirus not only affects physical health, but the outbreak of this virus can also have devastating psychological effects. To treat and diagnose, these impacts should be identified. This study aimed to investigate the role of perfectionism and self-compassion in predicting coronavirus anxiety.

Method: The sample consisted of 292 participants who responded online to the Coronavirus Anxiety Inventory, the Hewitt and Flett Multidimensional Perfectionism Scale (HF-MPS), and Self-Compassion Scale-Short Form (SCSSF). Data were analyzed by correlation and multiple regression analysis.

Results: The results have shown that Perfectionism and Self-compassion, predict coronavirus anxiety ($P < 0.001$). Also, mindfulness and common humanity, from self-compassion components, could predict coronavirus anxiety significantly ($P < 0.001$). Besides, Self-oriented perfectionism (SOP), Other-oriented perfectionism (OOP), and Socially prescribed perfectionism (SPP) predicted coronavirus anxiety.

Conclusion: These findings indicate that perfectionism is effective in exacerbating Coronavirus anxiety, and self-compassion is effective in modulating it. These variables can play an important role in general health policies, the diagnosis, prevention, and treatment of Coronavirus anxiety.

Keywords: Coronavirus, Anxiety, Perfectionism, Self-compassion, Health psychology.

Introduction

Coronavirus Disease 19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Gorbalenya et al., 2020), gradually became a worldwide pandemic (World Health Organization, 2020). Despite the short time since the outbreak of the virus, it has given rise to several problems in human relations; medical, economic, social, and psychological in nature (Fard & Saffarinia, n.d.). Due to the high prevalence of the disease, concerns regarding Covid-19 infection affect the behavior of

people at risk (Amin, 2020). According to the Angus Reid Institution, fifty percent of Canadians have expressed concern about themselves or their loved ones being infected with the Coronavirus (Angus Reid Institution, 2020). In a poll in the United States, two-thirds of Americans considered the Coronavirus a “real threat.” Fifty-six percent of Americans answered “very worried” and “worried” when asked about the virus (National Public Radio, 2020).

Taylor (2019), in his book, *The Psychology of pandemics*, citing the effects of the 2015 Ebola virus epidemic, states that the prevalence of fear could be worse than the outbreak of the disease, as the effects of fear and psychological problems are more sustained and widespread than the physical symptoms of the disease. The psychological effects

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of the SARS and Ebola virus persisted in people for months after recovery. Psychological effects of such fears were even observed among Americans who were living far from affected regions (Taylor, 2019). Nonetheless, not all people respond to crises in the same way, and some personality traits increase a person's vulnerability during crises (Taylor, 2019). Research has shown that clinical depression, living in urban areas, being a woman, and having a friend or family member infected with the Coronavirus increases a person's level of anxiety (Duan et al., 2020). Femininity, being single, and low levels of education also increase the likelihood of psychological effects on individuals (Xiaoming et al., 2020). The role of Coronavirus anxiety in predicting psychological problems, optimism and pessimism, and psychological inflexibility has also been demonstrated (Arslan et al., 2020). Additionally, Numerous studies have shown that social support, symptoms of depression, stress, and anxiety play an important role in vulnerability (Fisher et al., 2020; Fusar-Poli et al., 2020; Teng et al., 2020).

that Coronavirus anxiety and coping strategies are different in athletic and non-athletic students. Consequently, choosing a coping strategy for such a crisis requires taking a variety of them into consideration. As Flett and Zanganeh (2020) have pointed out, we are experiencing a period of uncertainty and unpredictability at this time, and such conditions increase individuals' need to find a way of dealing with the anxiety-inducing consequences of a pandemic. Different personalities, stress levels, and social support conditions, affects the choice of coping strategies (DeLongis & Holtzman, 2005).

Perfectionism is a variable that plays a role in intensifying anxiety. Perfectionism is described as a personality disposition characterized by striving for flawlessness and setting exceedingly high standards of performance, accompanied by overly critical evaluations of one's behavior (Stoeber & Childs, 2010). Perfectionism influences people's choice of strategies for coping with anxiety and stress (Stoeber,

2018b). In one study, positive Perfectionism was associated with positive coping styles and negative Perfectionism was associated with negative coping styles (Larijani & Besharat, 2010). The relationship between Perfectionism and threat appraisal and the avoidant coping style has also been reported (Stoeber & Rennert, 2008). In a study, based on the diathesis-stress model, it was shown that socially prescribed Perfectionism is related to both diathesis and stress (Chang & Rand, 2000). Additionally, Perfectionism has a crucial role in choosing a coping strategy for overcoming Coronavirus anxiety. A study showed that there is a difference between adaptive and maladaptive Perfectionism in the choice of a coping strategy to deal with the Coronavirus (Iancheva et al., 2020). Adaptive Perfectionism was correlated with emotional calm, vigor, and cognitive reconstruction, while maladaptive Perfectionism was correlated with tension, fatigue, and depression. Griffiths (2020) also points out that parental burnout in the face of a Coronavirus crisis can lead to child maltreatment and long-term and short-term traumatic consequences, which, according to previous studies (Sorkkila & Aunola, 2020), is likely to be a result of social perfectionism. In this case, parents who work hard to achieve the high standards that they think society has prescribed for them put themselves at greater risk of burnout. Hewitt states in *Perfectionism* (2017) that one of the basic needs of perfectionists is guaranteed and sustainable security. Such a need stems from a lack of self-confidence, rooted in their attachment styles; In other words, being perfect is not a desire but a need for perfectionists, a need that brings them a sense of security (Hewitt et al., 2017). In the current situation, providing such security is a new challenge for perfectionists, a challenge that can lead them to mental disorders and increase their level of anxiety (Flett & Hewitt, 2020). Homami (2017), has found that there is a relationship between Perfectionism and disease anxiety. A meta-analysis also found that concern about mistakes, doubts, actions, and personal standards had a positive correlation with anxiety, but

self-oriented and socially prescribed perfectionisms were weakly correlated with anxiety (Smith et al., 2018). found that obsessive-compulsive symptoms increased during the Coronavirus period (Cox & Olatunji, 2020). Rodgers (2020) also believes that the outbreak of Coronavirus has serious and destructive effects on the symptoms of eating disorders. One of the factors that can reduce the severity of mental disorders is Self-compassion (Barnett & Sharp, 2016; Ferrari et al., 2018; Mehr & Adams, 2016). Self-compassion is a scale introduced by Neff (2003), in response to criticisms of self-esteem. Self-compassion consists of three components: Self-Kindness rather than self-criticism, Common Humanity rather than Isolation, and Mindfulness rather than over-identifying with themselves (K. Neff, 2003). Macbeth showed via meta-analysis that Self-compassion can increase mental health and reduce mental distress (MacBeth & Gumley, 2012). Besides this, other studies have also emphasized the role of Self-compassion in mental health (K. D. Neff, 2011; K. D. Neff et al., 2007; Raque-Bogdan et al., 2011). These studies show that compassion, as a factor of mental health, can be a barrier to stress in critical situations, and reduce the severity of environmental stressors on mental health. Sirois (2015) revealed that self-compassionate people choose more adaptive coping styles rather than maladaptive ones in the context of chronic illness. Additionally, Self-compassion prevents individuals' vulnerability to depression (Shapira & Mongrain, 2010). Neff (2005) also showed that Self-compassion was associated positively with emotion-focused coping styles and negatively associated with avoidance-oriented strategies (K. D. Neff et al., 2005). It was concluded that concluded that self-compassionate people tend to have positive cognition reconstructing and are less reliant on negative coping strategies like the avoidant styles (Allen & Leary, 2010). Hence, Self-compassion can act as a barrier to the negative mental effects of the Coronavirus and prevent psychological distress.

A study in India also showed that Self-compassion can make people resilient to the anxiety of the Coronavirus (Gupta et al., 2020). Other studies have shown the role of Self-compassion and increasing it in dealing with the psychological consequences of Coronavirus (Mohammadpour et al., 2020). Whilst there have been numerous studies on Perfectionism and self-compassion, few studies have linked these two variables specifically to illness anxiety. Besides, the role of Self-compassion in reducing illness anxiety is still controversial. Although results indicate high rates of anxiety, depression, obsession, and post-traumatic stress among people (Damirchi et al., 2020; González-Sanguino et al., 2020; Moghanibashi-Mansourieh, 2020), the source of Coronavirus anxiety is still not well-understood, and more studies are needed in this area (Lee et al., 2020). So, the purpose of this was to investigate the role of Perfectionism and Self-compassion in predicting Coronavirus anxiety.

Method

Participants and Procedure

This descriptive study was conducted with a correlational design. The sample consisted of 292 participants, who voluntarily participated in the study. They participated in the study through an online survey. Based on sample size formulas in regression studies ($N \geq 8k + 50$) (Mayers, 2013), the sample size was considered 292 individuals. The sampling method in this study was voluntary. Participants participated in this study through an announcement. The announcement reassured them that their personal information would only be used for research purposes and would be kept with researchers. Apart from this, there is no other ethical consideration for this research. After preparing and compiling the research instruments, 3 questionnaires, namely CDAS, MPS, and SCS-SF, were entered into the Porsline, an online survey making website. After 1 month, 403 people completed 3 questionnaires, and the data were entered in SPSS 24 software,

of which 111 questionnaires were excluded from further analysis due to incomplete and outliers' data. Then the remaining data were analyzed using Pearson correlation coefficient and multiple regression analysis.

Measures

1. Corona Disease Anxiety scale (CDAS): This scale has been provided and validated by Alipour et al. (2020) in an Iranian population in 2020. This scale has 18 statements and two sub-scales. Items 1 to 9 measure mental symptoms, and items 10 to 18 measure physical symptoms of Coronavirus anxiety. Items are rated on a 4-point scale ranging from 'Never' to 'Always'. The internal consistency is reported as acceptable, the first sub-scale's Cronbach Alfa for which is 0.88, and 0.86 for the second one. Also, α for the total questionnaire is 0.92 (Alipour et al., 2020). As well, Cronbach's alfa in this study was .87.

2. Multidimensional Perfectionism scale (MPS): The multidimensional scale of Perfectionism was created by Hewitt and Felt in 1991. This scale consists of 30 items that measure the three components of self-oriented, other-oriented, and socially prescribed perfectionism. Each component consists of 10 statements that are answered by a 5-point Likert scale, ranging from "Strongly disagree" to "Strongly agree". In a validation study, in a sample of 480 Iranian students, Besharat (2005) reported adequate and satisfactory internal consistency, the Cronbach's Alfa for which was 0.89 for self-oriented perfectionism, 0.83 for other-oriented perfectionism, and 0.78 for socially prescribed (Besharat, 2005). Cronbach's alfa in this study was .87.

3. Self-Compassion Scale-Short Form (SCS-SF): The Self-compassion scale-short form has 12 statements that have been derived from the Self-compassion scale (2003). This scale has six sub-scales: Self-Kindness, Self-Judgment, Common Humanity, Isolation, Mindfulness, and Over-Identification. Items are rated on a 5-point scale ranging from 'Almost Never' to 'Almost Always'.

The internal consistency of the scale was reported by Khanjani (2016). The α value for the total scale was 0.91, and 0.83, 0.87, 0.91, 0.88, 0.92, and 0.77 for each sub-scale respectively (Khanjani et al., 2016). Cronbach's alpha in this study was lower than .5.

Results

The study included 292 (206 female, 85 male, and 1 other, and age $M= 27.89$ $SD= 10.69$) individuals who voluntarily participated in this study. The sample of the study also included 51% students and, 16.8% self-employees, 12.3% employees, 9.9% housewives, 4.5% people who had a job related to educational fields, 3.8% jobless, 1.7% people who had a job related to hospitals and healthcare. Besides, 37.8% had a high-school diploma or lower, 39.6% had a bachelor's degree, 16.7% had a master's degree, and 5.9% had a doctorate or higher.

As the first step in conducting regression analysis, the normality of distribution was tested with the Kolmogorov-Smirnov test. As shown in Table 1, none of the variables have a normal distribution. However, Kline (2015) states that by referring to the kurtosis and skewness data, it is possible to confirm this assumption in such a way that the kurtosis is less than 8 and the skewness is less than 3 (Kline, 2015). Thus, it can be said that the data have a normal distribution.

Next, the correlation between variables and predictors was measured. Table 2 shows that almost all of the variables are significantly associated with each other.

Three regression analyses with the enter method were conducted to analyze the role of Perfectionism and Self-compassion. In the first analysis, Perfectionism and Self-compassion were examined. At first, two statistical assumptions of Variance Inflation Factor (VIF) and Tolerance were checked. To establish the assumption of variance inflation factor, values greater than 10 are not acceptable. Additionally, to establish the tolerance assumption, the values must be between 0 and 1 (49). Another assumption in

regression analysis is Durbin-Watson, the best values of which must be between 1 to 3. Regarding Table 5, all assumptions have been met. Also, keeping in mind that $F=42.3$ and $P<.001$, the linearity assumption of regression analysis has been met. Finally, by taking β values into consideration, Self-compassion ($\beta=-0.29$) and Perfectionism ($\beta=0.15$) are able to predict the Corona Disease Anxiety.

Also, in order to investigate the role of Perfectionism and Self-compassion subscales, each scale was analyzed separately by the Enter method. As shown in Table 3, and as stated earlier, the assumptions of

addition, Self-oriented Perfectionism ($\beta=0.23$), Other-oriented Perfectionism and Socially prescribed Perfectionism ($\beta=0.17$), and Perfectionism ($\beta=0.15$) can respectively predict corona disease anxiety ($p<.001$).

To investigate the role of Self-compassion components, regression analysis was performed by the Enter method and the following results were obtained (Table 5). As it can be seen, Durbin-Watson's assumptions, Variance Inflation Factor, and Tolerance index are met in all cases. Also, due to the fact that $F = 42.3$ $P<.001$, the linearity

Table 1. Means, Standard Deviations, and Normality test of data

Variables	M	Sd.	Minimum	Maximum	Kurtosis	Skewness	K-S	P
Coronavirus anxiety	30.18	7.05	18	62	3.00	1.38	0.11	0.00
Coronavirus Mental Anxiety	18.85	4.97	9	36	1.11	0.90	0.11	0.00
Coronavirus Somatic Anxiety	11.32	2.87	9	28	7.92	2.34	0.22	0.00
Perfectionism	87.47	15.22	45	125	-0.35	0.21	0.04	0.02
Self-Oriented	29.35	7.02	13	49	-0.46	0.34	0.08	0.00
Other-Oriented	29.07	6.11	10	46	-0.11	0.00	0.06	0.00
Socially Prescribed	28.87	8.02	13	46	-0.54	0.20	0.06	0.00
Self-Compassion	38.26	4.61	24	50	1.20	-0.22	0.05	0.00
Self-Kindness	6.82	1.82	3	10	-0.67	-0.18	0.15	0.00
Self-Judgment	6.04	2.06	2	10	-0.83	-0.06	0.11	0.00
Common Humanity	6.66	1.83	2	10	-0.75	-0.18	0.15	0.00
Isolation	5.66	2.07	2	10	-0.83	-0.05	0.11	0.00
Mindfulness	7.17	1.95	2	10	-0.73	-0.33	0.18	0.00
Over Identification	5.88	1.99	2	10	-0.87	0.02	0.11	0.00

Tolerance, VIF, and Durbin-Watson had acceptable values for Perfectionism subscales. Besides, considering that $F=21.19$ and $P<.001$, the Linearity assumption in regression analysis was met. Taking the adjusted R^2 into account, Perfectionism predicts 17% of Corona Disease Anxiety variances. In

assumption of regression analysis has been met. However, not all subscales could predict anxiety. Rather, only Mindfulness and Common Humanity can significantly predict anxiety. Taking the adjusted R^2 into consideration, Mindfulness and Common Humanity are able to predict 22% of Corona

Disease Anxiety variances. Mindfulness ($\beta = -0.78$ $P < .001$) and Common Humanity ($\beta = -0.49$ $P < 0.05$) respectively predict Corona Disease Anxiety.

Discussion and Conclusion

The purpose of this study was to investigate the role of perfectionism and self-compassion in predicting coronavirus anxiety. The results revealed that all dimensions of Perfectionism have a positive relationship with coronavirus anxiety. Also, all dimensions of self-compassion were significantly correlated with all three dimensions of perfectionism. Self-kindness, common humanity, and mindfulness had a negative association with perfectionism, and self-judgment, isolation, and over-identification had a positive correlation with perfectionism. All sub-scales of perfectionism were correlated with Coronavirus anxiety. However, only mindfulness and common humanity from self-compassion could make significant predictions of Coronavirus anxiety. The results of this study are in line with other studies conducted by Gupta (2020) and Homami (2017). These researcher's findings show that perfectionism

and self-compassion play a crucial role in illness anxiety and Coronavirus anxiety.

This study revealed that perfectionism is one of the variables that can predict Coronavirus anxiety. Our results are in line with another study, which was conducted by Gupta (2020). The literature on the relationship between Perfectionism and mental health presents different results. While a study indicated that increasing personal standards among students decreases their levels of depression (Accordino et al., 2000), another study revealed that self-oriented Perfectionism was positively correlated with depression (Flett et al., 2011). A study investigating the relationship between Perfectionism and physical health, showed that self-oriented Perfectionism had a positive correlation with physical health, while this relation was negative in socially prescribed Perfectionism (Molnar et al., 2006). Stoeber (2018) believed that these discordant results may indicate the multi-dimensionality of Perfectionism.

He states that these dimensions should be considered when studying Perfectionism. All dimensions of Perfectionism can be divided into Striving

Table 2. Bivariate correlation among MPS, SCS-SF, and CDAS (N=292)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Coronavirus anxiety	1											
Perfectionism	0.42**	1										
Self-Oriented	0.35**	0.80**	1									
Other-Oriented	0.30**	0.75**	0.47**	1								
Socially Prescribed	0.29**	0.72**	0.31**	0.27**	1							
Self-Compassion	-0.06	0.24**	0.25**	0.07	0.20**	1						
Self-Kindness	-0.26**	-0.25**	-0.20**	-0.18**	-0.18**	0.34**	1					
Self-Judgment	0.22**	0.39**	0.36**	0.24**	0.25**	0.35**	-0.37**	1				
Common Humanity	-0.30**	0.28**	-0.26**	-0.16**	-0.21**	0.30**	0.42**	-0.31**	1			
Isolation	0.19**	0.39**	0.34**	0.15**	0.35**	0.52**	-0.21**	0.30**	-0.31**	1		
Mindfulness	-0.34**	-0.29**	-0.20**	-0.19**	-0.26**	0.38**	0.39**	-0.25**	0.37**	-0.22**	1	
Identification	0.27**	0.52**	0.46**	0.25**	0.44**	0.46**	-0.29**	0.34**	-0.33**	0.56	-0.31**	1

Perfectionism and Concern Perfectionism, the first of which has a positive relationship with health and the second of which a negative relation. Interestingly, we found new results. Stoeber (2018), in response to the question of how Perfectionism endangers people's mental health, states that those Perfectionists who are the most prone to health problems and stress are those who show a Perfectionist reaction. These people are constantly checking the perfection of events in response to the situations and needs of their daily lives, thus, if their experiences are not perfect, they feel self-inadequate, which results in feelings of shame or guilt and stress (Stoeber, 2018a). Flett (2016) also acknowledges that Perfectionism is closely related to stress, and perfectionists are more sensitive to stressors, so they become anxious when confronted with threatening ones (Flett et al., 2016). Given the above, it can be argued that the Coronavirus anxiety experienced by perfectionists is the result of their obsession with examining themselves and their environment during their daily lives to see if they are perfect, and because they are more sensitive, they are more prone to anxiety than non-Perfectionists. The results of this study are explained by the fact that people prioritize their health concerns in the

days of the Coronavirus. As such, when self-oriented perfectionism increases in individuals, Coronavirus anxiety also increases. self-oriented Perfectionism forces people to work harder by constantly creating higher standards. However, not only do such efforts fail at removing the person from threatening situations, but they also cause fatigue and exhaustion. In this situation, self-oriented perfectionism does not guarantee security and health, but instead puts perfectionists in a vicious challenge to fight a virus that can only be overcome by following specific protocols, and it is not necessary to set high standards to fight it. Such standards, as shown, reduce the mental health of individuals in this situation. Since overcoming the Coronavirus requires collective mobilization, perfectionistic reactivity toward others can be a problem for perfectionists. Other-oriented perfectionists, who expect those around them to be perfect, can put massive pressure on themselves and others. Such pressure forces them to try to fight individually and to stay away from dangerous situations as much as possible, or to make efforts and activities to eliminate the danger. These efforts and activities ultimately lead not to the elimination of danger, threat, and pressure, but in fatigue, burnout,

Table 3. Results of the regression analysis of MPS and SCS-SF in predicting CDAS

Variables	β	SE	B	T	P	Tolerance	VIF	R ²	F	P	DW
MPS (Perfectionism)	0.15	0.26	0.33	6.07	0.00	0.86	1.15				
SCS-SF (Self- compassion)	-0.29	0.69	-0.23	-4.19	0.00	0.86	1.15	0.22	42.37	<.001	1.24
Self-oriented	0.23	0.63	0.23	3.74	0.00	0.73	1.35				
Other-oriented	0.17	0.71	0.14	2.40	0.01	0.75	1.32	0.17	21.19	<.001	1.19
Socially prescribed	0.17	0.05	0.17	2.40	0.00	0.88	1.13				
Self-Kindness	-0.25	0.24	-0.06	-1.04	0.29	0.70	1.41				
Self-Judgment	0.20	0.20	0.06	0.99	0.31	0.77	1.29				
Common Humanity	-0.49	0.24	-0.13	-2.04	0.04	0.71	1.39	0.16	10.28	<.001	1.12
Isolation	0.02	0.22	0.00	0.11	0.91	0.65	1.52				
Mindfulness	-0.78	0.22	-0.21	-3.54	0.00	0.76	1.31				
Identification	0.40	0.24	0.11	1.66	0.98	0.61	1.64				

and anxiety.

The results also showed that the less self-compassionate people are, the greater their Coronavirus anxiety is. This result is in line with other studies related to Coronavirus anxiety (Shapira & Mongrain, 2010). Regardless of the Coronavirus, other studies have indicated that Self-compassion plays an important role in cognitive resilience and resistance to psychopathologies. Trompetter (2017) showed that high levels of Self-compassion moderate the relation between negative emotional states and psychopathologies. He argues that this may be due to the robustness of self-compassionate people's mental health, which leads to increased Self-compassion and, consequently, resilience to mental disorders (Trompetter et al., 2017). Self-compassion can also be a factor in reducing stress by neutralizing negative emotions and creating positive feelings such as kindness and bonding, that act as an emotion regulation strategy (K. D. Neff et al., 2005). It has been shown that Self-compassion can reduce social anxiety by influencing the choice of coping strategies (Ştefan, 2019). Finally, Studies suggest that Self-compassion can directly or indirectly reduce anxiety. In this study, it was showed that Self-compassion could predict a low amount of Coronavirus anxiety. However, not all dimensions of Self-compassion had a meaningful role in predicting anxiety. Only Mindfulness and Common Humanity could predict Coronavirus anxiety significantly. This result is in agreement with the findings of other studies (Saricali et al., 2020; Wielgus et al., 2020). A study has revealed that Mindfulness can decrease Coronavirus pandemic related distress (Conversano et al., 2020). Other research has shown that Mindfulness is closely related to mental health (Greeson, 2009). By reducing rumination (negative mental conflict, about the past or future) and worrying (feeling anxious about real or potential problems), improving working memory capacity (decision-making power and coping strategies), and regulating emotions (ability to manage negative

emotions), Mindfulness reduces anxiety symptoms and protects the person against psychopathologies (Arch & Craske, 2006; Desrosiers et al., 2013; Jha et al., 2010). Also, Coffey states that by reducing the dependency of a person's happiness on conditions, Mindfulness leads to a reduction of anxiety (Coffey & Hartman, 2008). In addition, Roberts (2010) showed that mindfulness results in more physical activity, stronger health perception, less binge eating, better sleep quality, less smoking, and fewer sexual partners throughout life (Roberts & Danoff-Burg, 2010). It has also been shown that when people are not mindful of their pain, they are reluctant to accept it. Such rejection can manifest itself in two ways: as conscious avoidance (Hayes et al., 1996), and as emotional resistance to pain (K. Neff, 2003). Neff defines Mindfulness as a balanced state of awareness in which thoughts and feelings are nonjudgmentally observed, as they are, and without avoiding or changing them, but also without exaggerating them or getting carried away by them (K. D. Neff et al., 2005). Thus, it can be said that during the Coronavirus pandemic, Mindfulness can lead to better mental health by increasing healthy and positive behaviors, which protects the person against Coronavirus anxiety. In other words, although mindful people experience a normal amount of anxiety during Coronavirus pandemic and worry about themselves and their loved ones, they address their behaviors by observing their thoughts and feelings non-judgmentally, which leads to increased mental and physical health. Hence, they experience a lower level of anxiety.

Common Humanity is another component of self-compassion. Neff defines Common Humanity as seeing one's experiences as part of the larger human experience, rather than seeing them as separating and isolating (K. Neff, 2003). Instead of isolating himself from other human beings, he envisions his suffering and perhaps his successes and victories as a part of a global experience that is not unique to him, and is common to all members of the global community. In

this study, it was indicated that common humanity can predict Coronavirus anxiety. This result shows that the knowledge that this crisis is a global issue, and that almost all countries are dealing with it, is a source of calm and a factor against the psychological effects of the pandemic. Knowing others as partners in our sufferings can reduce the anxiety of the Coronavirus. Although the results of previous studies show that Self-compassion and its dimensions play a role in predicting health, only common humanity and mindfulness were able to significantly predict Coronavirus anxiety in this study. This may be due to cultural differences or the limitations of the present study. However, such a finding needs further investigation.

Overall, the results of this study, along with other studies, show that, in addition to dealing with the physical consequences of the Coronavirus, society is also experiencing its psychological impacts. While Perfectionism can be considered as a predisposing factor in this period, self-compassion, as a health factor, can protect individuals' mental health and prevent Coronavirus anxiety.

Despite the consistent and novel explanations obtained from this research, there were some limitations to this research which should be mentioned. First, the sample size was relatively small for a regression study. As such, it is suggested that future studies utilize a larger population. Also, participants answered questions through an online survey, which could influence the reliability of participants' responses. Such an approach also impairs the generalizability of the data due to the fact that the localities from which the respondents participated in the study are not part of the dataset. As a result, it is suggested that other sampling and research methods be used in future studies.

The results of this study can be beneficial in the prediction of Coronavirus anxiety. Regarding the results, perfectionism and its dimensions have a crucial role in Coronavirus anxiety. As such, Coronavirus anxiety can be prevented by identifying

perfectionists and providing related solutions for them. Besides, it was indicated that Self-compassion can play a role in predicting Coronavirus anxiety. These results may influence predicting and treatment of Coronavirus anxiety.

References

- Accordino, D. B., Accordino, M. P., & Slaney, R. B. (2000). An investigation of perfectionism, mental health, achievement, and achievement motivation in adolescents. *Psychology in the Schools*, 37(6), 535–545. [https://doi.org/https://doi.org/10.1002/1520-6807\(200011\)37:6<535::AID-PITS6>3.0.CO;2-O](https://doi.org/https://doi.org/10.1002/1520-6807(200011)37:6<535::AID-PITS6>3.0.CO;2-O)
- Alipour, A., Ghadami, A., Alipour, Z., & Abdollahzadeh, H. (2020). Preliminary validation of the Corona Disease Anxiety Scale (CDAS) in the Iranian sample. *Quarterly Journal Of Health Psychology*, 8(32), 163–175. <https://doi.org/10.30473/hpj.2020.52023.4756>
- Allen, A. B., & Leary, M. R. (2010). Self-Compassion, Stress, and Coping. *Social and Personality Psychology Compass*, 4(2), 107–118. <https://doi.org/10.1111/j.1751-9004.2009.00246.x>
- Amin, S. (2020). The psychology of coronavirus fear: Are healthcare professionals suffering from corona-phobia? *International Journal of Healthcare Management*, 1–8.
- Angus Reid Institution. (2020). *Half in Canada now worried about risk of infection among friends, family and community*. <http://angusreid.org/coronavirus-march-2020/>
- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, 44(12), 1849–1858.
- Arslan, G., Yildirim, M., Tanhan, A., Buluc, M., & Allen, K.-A. (2020). Coronavirus stress, optimism-pessimism, psychological inflexibility, and psychological health: Psychometric properties of the Coronavirus Stress Measure. *International Journal of Mental Health and Addiction*, 1.
- Bagheri Sheykhgafshe, F., Tajbakhsh, K., & Abolghasemi, A. (2020). Comparison of Covid-19 Anxiety, Coping Styles and Health Anxiety in Athletic and Non-Athletic Students. *Sport Psychology Studies*, 9(32), 283–306. <https://doi.org/10.22089/spsyj.2020.9377.2027>
- Barnett, M. D., & Sharp, K. J. (2016). Maladaptive perfectionism, body image satisfaction, and disordered eating behaviors among U.S. college women: The mediating role of self-compassion. *Personality and Individual Differences*, 99, 225–234. <https://doi.org/>

- <https://doi.org/10.1016/j.paid.2016.05.004>
- Besharat, M. A. (2005). Exploratory Analysis of the Relationship Between Perfectionism and Personality. *Educational And Psychology Studies, 21*(3).
- Chang, E. C., & Rand, K. L. (2000). Perfectionism as a predictor of subsequent adjustment: Evidence for a specific diathesis–stress mechanism among college students. In *Journal of Counseling Psychology* (Vol. 47, Issue 1, pp. 129–137). American Psychological Association. <https://doi.org/10.1037/0022-0167.47.1.129>
- Coffey, K. A., & Hartman, M. (2008). Mechanisms of action in the inverse relationship between mindfulness and psychological distress. *Complementary Health Practice Review, 13*(2), 79–91.
- Conversano, C., Di Giuseppe, M., Miccoli, M., Ciacchini, R., Gemignani, A., & Orrù, G. (2020). Mindfulness, Age and Gender as Protective Factors Against Psychological Distress During COVID-19 Pandemic. *Frontiers in Psychology, 11*, 1900. <https://doi.org/10.3389/fpsyg.2020.01900>
- Cox, R. C., & Olatunji, B. O. (2020). Linking insomnia and OCD symptoms during the coronavirus pandemic: Examination of prospective associations. *Journal of Anxiety Disorders, 77*, 102341. <https://doi.org/10.1016/j.janxdis.2020.102341>
- Damirchi, E. S., Mojarrad, A., Pireinaladin, S., & Grjibovski, A. M. M. (2020). The Role of Self-Talk in Predicting Death Anxiety, Obsessive-Compulsive Disorder, and Coping Strategies in the Face of Coronavirus Disease (COVID-19). *Iranian Journal of Psychiatry*.
- DeLongis, A., & Holtzman, S. (2005). Coping in Context: The Role of Stress, Social Support, and Personality in Coping. *Journal of Personality, 73*(6), 1633–1656. <https://doi.org/10.1111/j.1467-6494.2005.00361.x>
- Desrosiers, A., Vine, V., Klemanski, D. H., & Nolen-Hoeksema, S. (2013). Mindfulness and emotion regulation in depression and anxiety: common and distinct mechanisms of action. *Depression and Anxiety, 30*(7), 654–661. <https://doi.org/10.1002/da.22124>
- Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in china during the outbreak of COVID-19. *Journal of Affective Disorders, 275*, 112–118. <https://doi.org/https://doi.org/10.1016/j.jad.2020.06.029>
- Fard, S. A., & Saffarinia, M. (n.d.). *The prediction of mental health based on the anxiety and the social cohesion that caused by Coronavirus*.
- Ferrari, M., Yap, K., Scott, N., Einstein, D. A., & Ciarrochi, J. (2018). Self-compassion moderates the perfectionism and depression link in both adolescence and adulthood. *PLoS One, 13*(2), e0192022.
- Fisher, P. L., Salmon, P., Heffer-Rahn, P., Huntley, C., Reilly, J., & Cherry, M. G. (2020). Predictors of emotional distress in people with multiple sclerosis: A systematic review of prospective studies. *Journal of Affective Disorders, 276*, 752–764. <https://doi.org/https://doi.org/10.1016/j.jad.2020.07.073>
- Flett, G. L., & Hewitt, P. L. (2020). The perfectionism pandemic meets COVID-19: Understanding the stress, distress and problems in living for perfectionists during the global health crisis. *J. Concurr. Disord, 2*, 80–105.
- Flett, G. L., Nepon, T., Hewitt, P. L., & Fitzgerald, K. (2016). Perfectionism, Components of Stress Reactivity, and Depressive Symptoms. *Journal of Psychopathology and Behavioral Assessment, 38*(4), 645–654. <https://doi.org/10.1007/s10862-016-9554-x>
- Flett, G. L., Panico, T., & Hewitt, P. L. (2011). Perfectionism, Type A Behavior, and Self-Efficacy in Depression and Health Symptoms among Adolescents. *Current Psychology, 30*(2), 105–116. <https://doi.org/10.1007/s12144-011-9103-4>
- Flett, G. L., & Zangeneh, M. (2020). Mattering as a vital support for people during the COVID-19 pandemic: the benefits of feeling and knowing that someone cares during times of crisis. *Journal of Concurrent Disorders, 2*(1), 106–123.
- Fusar-Poli, P., Brambilla, P., & Solmi, M. (2020). Learning from COVID-19 pandemic in northern Italy: Impact on mental health and clinical care. *Journal of Affective Disorders, 275*, 78–79. <https://doi.org/https://doi.org/10.1016/j.jad.2020.06.028>
- González-Sanguino, C., Ausín, B., Castellanos, M. Á., Saiz, J., López-Gómez, A., Ugidos, C., & Muñoz, M. (2020). Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. *Brain, Behavior, and Immunity, 87*, 172–176. <https://doi.org/https://doi.org/10.1016/j.bbi.2020.05.040>
- Gorbalenya, A. E., Baker, S. C., Baric, R. S., de Groot, R. J., Drosten, C., Gulyaeva, A. A., Haagmans, B. L., Lauber, C., Leontovich, A. M., Neuman, B. W., Penzar, D., Perlman, S., Poon, L. L. M., Samborskiy, D. V., Sidorov, I. A., Sola, I., Ziebuhr, J., & Viruses, C. S. G. of the I. C. on T. of. (2020). The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. *Nature Microbiology, 5*(4), 536–544. <https://doi.org/10.1038/s41564-020-0695-z>
- Greeson, J. M. (2009). Mindfulness Research Update: 2008. *Complementary Health Practice Review, 14*(1), 10–18. <https://doi.org/10.1177/1533210108329862>

- Griffith, A. K. (2020). Parental Burnout and Child Maltreatment During the COVID-19 Pandemic. *Journal of Family Violence*. <https://doi.org/10.1007/s10896-020-00172-2>
- Gupta, V. K., Singh, M. A., & Others. (2020). Can Self-compassion Be A Resilient Factor For Psychological Distress? Relationship Of Self-compassion With Psychological Distress During Lockdown Due To Novel Coronavirus Disease (Covid-19) Outbreak In India. *Journal Of Critical Reviews*, 7(13), 2551–2561.
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64(6), 1152.
- Hewitt, P. L., Flett, G. L., & Mikail, S. F. (2017). Perfectionism: A relational approach to assessment, treatment, and conceptualization. *New York: Guilford*.
- Homami, R., Matlabi, M., Khademi, Z., Sheykhloo, R., & Seif, A. (2017). The Relationship Between Perfectionism And Disease Anxiety In Gastrointestinal Patients With Gastroesophageal Reflux Disease In Miandoab. *The Journal of New Advances in Behavioral Sciences*, 2(6), 53–65.
- Iancheva, T., Rogaleva, L., Garcia-Mas, A., & Olmedilla, A. (2020). PERFECTIONISM, MOOD STATES, AND COPING STRATEGIES OF SPORTS STUDENTS FROM BULGARIA AND RUSSIA DURING THE PANDEMIC COVID-19. *Journal of Applied Sports Sciences*, 1, 22–38.
- Jha, A. P., Stanley, E. A., Kiyonaga, A., Wong, L., & Gelfand, L. (2010). Examining the protective effects of mindfulness training on working memory capacity and affective experience. *Emotion (Washington, D.C.)*, 10(1), 54–64. <https://doi.org/10.1037/a0018438>
- Khanjani, S., Foroughi, A. A., Sadghi, K., & Bahrainian, S. A. (2016). Psychometric properties of Iranian version of self-compassionscale (short form). *Pajoohande*, 21(5). <http://pajoohande.sbmu.ac.ir/article-1-2292-en.html>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.
- Larijani, R., & Besharat, M. A. (2010). Perfectionism and coping styles with stress. *Procedia - Social and Behavioral Sciences*, 5, 623–627. <https://doi.org/https://doi.org/10.1016/j.sbspro.2010.07.154>
- Lee, S. A., Jobe, M. C., & Mathis, A. A. (2020). Mental health characteristics associated with dysfunctional coronavirus anxiety. *Psychological Medicine*, 1–2.
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, 32(6), 545–552. <https://doi.org/https://doi.org/10.1016/j.cpr.2012.06.003>
- Mayers, A. (2013). *Introduction to statistics and SPSS in psychology*. Pearson Higher Ed.
- Mehr, K. E., & Adams, A. C. (2016). Self-Compassion as a Mediator of Maladaptive Perfectionism and Depressive Symptoms in College Students. *Journal of College Student Psychotherapy*, 30(2), 132–145. <https://doi.org/10.1080/87568225.2016.1140991>
- Moghanibashi-Mansourieh, A. (2020). Assessing the anxiety level of Iranian general population during COVID-19 outbreak. *Asian Journal of Psychiatry*, 51, 102076. <https://doi.org/https://doi.org/10.1016/j.ajp.2020.102076>
- Mohammadpour, M., Ghorbani, V., Khoramnia, S., Ahmadi, S. M., Ghvami, M., & Maleki, M. (2020). Anxiety, Self-Compassion, Gender Differences and COVID-19: Predicting Self-Care Behaviors and Fear of COVID-19 Based on Anxiety and Self-Compassion with an Emphasis on Gender Differences. *Iranian Journal of Psychiatry*, 15(3 SE-Original Article(s)). <https://doi.org/10.18502/ijps.v15i3.3813>
- Molnar, D. S., Reker, D. L., Culp, N. A., Sadava, S. W., & DeCourville, N. H. (2006). A mediated model of perfectionism, affect, and physical health. *Journal of Research in Personality*, 40(5), 482–500. <https://doi.org/https://doi.org/10.1016/j.jrp.2005.04.002>
- National Public Radio. (2020). *Most Americans Say U.S. "Doing Enough" To Prevent Coronavirus Spread*. <https://www.npr.org/sections/health-shots/2020/02/04/802387025/poll-most-americans-say-u-s-doing-enough-to-prevent-coronavirus-spread?t=1596955846774>
- Neff, K. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2(2), 85–101.
- Neff, K. D. (2011). Self-Compassion, Self-Esteem, and Well-Being. *Social and Personality Psychology Compass*, 5(1), 1–12. <https://doi.org/10.1111/j.1751-9004.2010.00330.x>
- Neff, K. D., Hsieh, Y.-P., & Dejitterat, K. (2005). Self-compassion, Achievement Goals, and Coping with Academic Failure. *Self and Identity*, 4(3), 263–287. <https://doi.org/10.1080/13576500444000317>
- Neff, K. D., Rude, S. S., & Kirkpatrick, K. L. (2007). An examination of self-compassion in relation to positive psychological functioning and personality traits. *Journal of Research in Personality*, 41(4), 908–916. <https://doi.org/https://doi.org/10.1016/j.jrp.2006.08.002>
- Raque-Bogdan, T. L., Ericson, S. K., Jackson, J., Martin, H. M., & Bryan, N. A. (2011). Attachment and mental

- and physical health: Self-compassion and mattering as mediators. In *Journal of Counseling Psychology* (Vol. 58, Issue 2, pp. 272–278). American Psychological Association. <https://doi.org/10.1037/a0023041>
- Roberts, K. C., & Danoff-Burg, S. (2010). Mindfulness and health behaviors: is paying attention good for you? *Journal of American College Health, 59*(3), 165–173.
- Rodgers, R. F., Lombardo, C., Cerolini, S., Franko, D. L., Omori, M., Fuller-Tyszkiewicz, M., Linardon, J., Courtet, P., & Guillaume, S. (2020). The impact of the COVID-19 pandemic on eating disorder risk and symptoms. *The International Journal of Eating Disorders, 53*(7), 1166–1170. <https://doi.org/10.1002/eat.23318>
- Saricali, M., Satici, S. A., Satici, B., Gocet-Tekin, E., & Griffiths, M. D. (2020). Fear of COVID-19, Mindfulness, Humor, and Hopelessness: A Multiple Mediation Analysis. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-020-00419-5>
- Shapira, L. B., & Mongrain, M. (2010). The benefits of self-compassion and optimism exercises for individuals vulnerable to depression. *The Journal of Positive Psychology, 5*(5), 377–389. <https://doi.org/10.1080/17439760.2010.516763>
- Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2015). Self-Compassion, Stress, and Coping in the Context of Chronic Illness. *Self and Identity, 14*(3), 334–347. <https://doi.org/10.1080/15298868.2014.996249>
- Smith, M. M., Vidovic, V., Sherry, S. B., Stewart, S. H., & Saklofske, D. H. (2018). Are perfectionism dimensions risk factors for anxiety symptoms? A meta-analysis of 11 longitudinal studies. *Anxiety, Stress, & Coping, 31*(1), 4–20. <https://doi.org/10.1080/10615806.2017.1384466>
- Sorkkila, M., & Aunola, K. (2020). Risk Factors for Parental Burnout among Finnish Parents: The Role of Socially Prescribed Perfectionism. *Journal of Child and Family Studies, 29*(3), 648–659. <https://doi.org/10.1007/s10826-019-01607-1>
- Ştefan, C. A. (2019). Self-compassion as mediator between coping and social anxiety in late adolescence: A longitudinal analysis. *Journal of Adolescence, 76*, 120–128.
- Stoeber, J. (2018a). *The psychology of perfectionism: Critical issues, open questions, and future directions*.
- Stoeber, J. (2018b). *The psychology of perfectionism: Theory, research, applications*.
- Stoeber, J., & Childs, J. H. (2010). The assessment of self-oriented and socially prescribed perfectionism: Subscales make a difference. *Journal of Personality Assessment, 92*(6), 577–585.
- Stoeber, J., & Rennert, D. (2008). Perfectionism in school teachers: Relations with stress appraisals, coping styles, and burnout. *Anxiety, Stress, & Coping, 21*(1), 37–53. <https://doi.org/10.1080/10615800701742461>
- Taylor, S. (2019). *The psychology of pandemics: Preparing for the next global outbreak of infectious disease*. Cambridge Scholars Publishing.
- Teng, Z., Wei, Z., Qiu, Y., Tan, Y., Chen, J., Tang, H., Wu, H., Wu, R., & Huang, J. (2020). Psychological status and fatigue of frontline staff two months after the COVID-19 pandemic outbreak in China: A cross-sectional study. *Journal of Affective Disorders, 275*, 247–252. <https://doi.org/https://doi.org/10.1016/j.jad.2020.06.032>
- Trompeter, H. R., de Kleine, E., & Bohlmeijer, E. T. (2017). Why does positive mental health buffer against psychopathology? An exploratory study on self-compassion as a resilience mechanism and adaptive emotion regulation strategy. *Cognitive Therapy and Research, 41*(3), 459–468.
- Wielgus, B., Urban, W., Patriak, A., & Cichocki, L. (2020). Examining the Associations between Psychological Flexibility, Mindfulness, Psychosomatic Functioning, and Anxiety during the COVID-19 Pandemic: A Path Analysis. *International Journal of Environmental Research and Public Health, 17*(23), 8764.
- World Health Organization. (2020). *Coronavirus disease (COVID-19) Weekly Epidemiological Update and Weekly Operational Update*. World Health Organization. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
- Xiaoming, X., Ming, A., Su, H., Wo, W., Jianmei, C., Qi, Z., Hua, H., Xuemei, L., Lixia, W., Jun, C., Lei, S., Zhen, L., Lian, D., Jing, L., Handan, Y., Haitang, Q., Xiaoting, H., Xiaorong, C., Ran, C., ... Li, K. (2020). The psychological status of 8817 hospital workers during COVID-19 Epidemic: A cross-sectional study in Chongqing. *Journal of Affective Disorders, 276*, 555–561. <https://doi.org/https://doi.org/10.1016/j.jad.2020.07.092>

An Investigation on the Effect of Rational Emotive Behavior Therapy on Reduction of Anxiety, Depression, and Distress in People with Anxiety Disorder In the age of Corona

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Abstract

Objective: This study aimed to investigate the effect of rational emotive behavior therapy (REBT) of anxiety, depression, and distress in people with an anxiety disorder.

Method: The present study was applied and quasi-experimental in terms of the method (consisting of pre-test, post-test, and control group). The population of this study consisted of people with anxiety disorder referred to Loghman Hospital in Tehran in the age of 2019. Twenty people who were selected as participants based on the inclusion criteria were randomly divided into two groups (i.e., REBT and control groups) equally (10 people in each group). Experimental pretest and posttest were performed using the Depression Anxiety Stress Scale (DASS), and the participants in the experimental group underwent the experiment for three months (a two-hour session per week).

Results: The results were analyzed using analysis of covariance. The results showed that REBT intervention was significantly effective ($P=0.05$) in reducing patients' distress, depression, and anxiety.

Conclusions: Thus, REBT can reduce patients' psychological problems by helping them recognize their irrational beliefs better and reduce their anxiety (self-blame) and hostility (blaming others and the universe).

Keywords: Rational Emotive Behavior Therapy (REBT), Distress, Depression, Anxiety.

Introduction

Anxiety disorders are considered as one of the most common psychological disorders (Sadock, Sadock, & Ruiz, 2015). Morbid anxiety causes a wide range of anxiety disorders, from cognitive and physical disorders to unwarranted fears and phobias (Norton, 2007). The American Psychiatric Association (2013) recognizes fear and anxiety as characteristics of anxiety disorders. Fear is defined as an emotional response to a real or perceived threat, and anxiety is defined as predicting a future threat. According to the American

Psychiatric Association (2013), the prevalence of generalized anxiety disorder (GAD) is 0.9% and 2.9% in adolescents and adults, respectively, and women are twice as likely as men to develop the disorder.

Anxiety usually manifests itself in the form of concern and ruminating thoughts. People who experience anxiety have a strong and resilient concern for possible adverse events that may occur in the future (Barlow, cited in Iqbal & Dar, 2015). Like ruminating thoughts, anxiety occurs as a frequent overthinking of emotional distress and concern. However, ruminating thought is not the same as anxiety. The content of ruminating thought can be passed, present, and future events that have caused (or will cause) emotional distress and concern, while the content of anxiety is future events. However, these two can complement each other in

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anxiety (Laceulle, Marcel, van Aken, Ormel, & Esther Nederhof, 2015).

REBT is regarded as one of the therapeutic interventions for anxiety. REBT is designed to identify emotional problems quickly, within one to ten sessions, and introduce them to the patients to help the patients modify these problems and practice the rational philosophy in their life to solve the problems (Prochaska, 2008). Studies show that REBT is effective in reducing anxiety (Shahandeh & Safarzadeh, 2010). REBT considers rational and irrational beliefs the most essential factors in cognitive vulnerability and flexibility (David, 2014). REBT regards two kinds of beliefs in the belief system: rational and irrational beliefs (David, Lynn, & Ellis, 2010; Ellis 1994).

Irrational beliefs, which are exaggerated, strict, biased, unrealistic, untrue beliefs and are the basis for psychological problems, can damage the individuals and their relationships with others (Dryden & Branch, 2008). According to REBT, irrational beliefs play a crucial role in the incidence of behavioral and emotional disorders. Researchers pointed to the relationship of irrational beliefs with depression (Vîslă, Flückiger, Grosse Holtforth, & David, 2016; Oltean, Hyland, Vallières, & David, 2017), anxiety (Culhane & Watson, 2003; DiGiuseppe, R., Leaf, R., Gorman, B., & Robin, 2018), post-traumatic stress disorders (Hyland, Shevlin, & Adamson, 2014), anger and guilt (Vîslă et al., 2016), and eating problems (Mayhew & Edelman, 1989).

Rational beliefs are healthy, logical beliefs consistent with reality and lead to constructive emotional and behavioral reactions (Dryden & Branch, 2008). Rational beliefs are grouped into four basic categories which are preference (referring to flexible desires and inclinations), non-catastrophizing beliefs (referring to the evaluation of negative realities of life in a realistic sense), high frustration tolerance (can be tolerant and withstand essential and unbearable events) and unconditional acceptance of oneself and the others (unconditional acceptance of oneself, others and the world, even if something happens against individual's

will) (Hyland et al., 2014). Hyland et al. (2014) showed that rational beliefs play an essential protective role in the emergence of PTS symptoms (Hyland et al., 2014). Rational beliefs, as a protective factor, show that these beliefs moderate the relationship of irrational beliefs with emotional states of distress, depression, and anxiety. The positive relationship of irrational beliefs with distress, depression, and anxiety is stronger when the level of rational beliefs is low and if the level of rational beliefs is high, this relationship is weaker (Caserta et al., 2010).

REBT tries to correct the irrational thoughts and beliefs of the patients (Buschmann, Horn, Blankenship, Garcia, & Bohan, 2018). In this method, REBT powerfully directs the irrational thoughts of the patients to their consciousness and makes the patients aware of them. It shows the patients how these irrational thoughts have caused them emotional discomfort, it makes clear how exactly the inner sentences are irrational, and it teaches the patients how to rethink and reconstruct these irrational sentences and turn them into rational thoughts (Balkis & Duru, 2018). Research has also shown that cognitive techniques reduce emotional distress in MS patients (Abolghasemi, Mikaeili, Khoshnoodnia Chomachaei, & Karimi Yousefi, 2018). Thus, the overall goal of emotional rational behavior therapy is to minimize the client's main point of view on self-destruction and help him or her acquire a more flexible and realistic philosophy of life.

Anxiety causes psychological and social changes. Anxiety makes a person feel miserable, alone, helpless, hostile, and revengeful towards others (Beck, 2008). Various negative and annoying consequences of this disorder make it necessary to understand its nature as well as treatment methods (Ashayeri, Hooman, Jamali Firoozabadi, & Watankhah, 2009). Given the wide range of treatments introduced in society to treat this problem, it is beneficial to recognize therapies such as REBT for further actions. Given the abovementioned discussions, the present study seeks to answer whether REBT affects the reduction of anxiety, depression, and distress in people with an anxiety disorder.

Method

The present study was a quasi-experimental research with pre-test, post-test, and control group. The population of this study consisted of people with anxiety disorder referred to Loghman Hospital in Tehran who had an active anamnesis in the period of winter 2018 to spring 2020. Twenty people (10 people in each group) were selected in this study as control and experimental groups. Inclusion criteria were DSM-5 diagnostic criteria for anxiety disorder diagnosed by a psychiatrist, no history of psychological treatments before entering the study, minimum age of 18 years and maximum age of 50 years, holders of high school diploma and higher academic degrees, and the patient signed written consent to participate in the research. Exclusion criteria were having psychiatric and other physical illnesses, not attending training sessions for more than two sessions, not willing to participate in the research, and receiving psychological therapies for any reason. The sample of this study was selected using the purposive and convenience sampling methods. To do this, we talked to a number of anxious patients in counseling centers and hospitals in Tehran and explained the purpose of the research and how to conduct it and questionnaires. After informing the patients about the subject and how to conduct the research, patients who were ready to participate in the research were selected as the subjects to conduct the research.

Procedure and participants

To conduct this study, a pretest-posttest experimental design was performed using the Stress Anxiety Depression Scale (DASS) and the experimental group was treated for three months (a two-hour session per week) with REBT in the group.

Ethical Statement

To take into account the ethical considerations, the participants were informed that they have full authority to participate in the research. In addition, control group were included in the waiting list for psychological intervention.

Research instruments

Depression Anxiety Stress Scale (DASS): The DASS

(Lovibond & Lovibond, 1995) is a 21-item measure that includes three subscales assessing symptoms of depression, anxiety, and stress on a four-point scale from the lowest score 0 to the highest score 30. The score of each individual on each scale is measured through seven items specific to that scale. This scale is one of the most valid tools for assessing the symptoms of negative emotions and its reliability and validity is confirmed in numerous studies (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997; Lovibond & Lovibond, 1995). Besharat (2005) analyzed the scores of a sample selected from a general population ($n=278$) and reported that Cronbach's alpha coefficients of the DASS are 0.87, 0.85, 0.89, and 0.91 for depression, anxiety, stress, and the total scale, respectively. Moreover, the scores of a clinical sample ($n = 194$) were analyzed and it was reported that these coefficients are 0.89, 0.91, 0.87, and 0.93 for depression, anxiety, stress, and the total scale, respectively. These coefficients confirm the internal consistency of the DASS to a reasonable extent. Concurrent, convergent, and diagnostic (discriminant) validities of the DASS were calculated and approved through implementing the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979), Beck Anxiety Scale (BAI; Beck & Epstein, 1993), Positive and Negative Affect Schedule (PANAS; Watson, Clarke, & Tellegen, 1988) and the Mental Health Inventory for subjects simultaneously and comparing the scores of the general and clinical populations (Besharat, 2005). The results of the Pearson correlation coefficient showed that there is a significant positive correlation from 0.41 to 0.61 ($p < 0.001$) among the subjects' DASS scores for depression, anxiety, and stress scales and their BDI, BAI, Negative Affect, and psychological helplessness scores and there is a significant negative correlation from 0.41 to 0.58 ($p < 0.001$) among subject's DASS scores for depression, anxiety, and stress scales and their Positive effect and Psychological Well-being. These results confirm the concurrent, convergent, and diagnostic validities of the DASS.

Table 1. Goals listed in Ellis's educational intervention

Session	Goal
1 st	To build communication and trust, to obtain a general understanding of the logic of Ellis' approach. Expressing goals, making members more familiar with the rational-emotional-behavioral approach and irrational beliefs, examining the problem from the point of view of each member, task and end
2 nd	Start by recalling the task of the last session, expressing the role of thoughts and ideas on psychological well-being, helping members to be aware of the role of ideas and beliefs in creating problems. To introduce the main concepts of Ellis's approach and to present the A-B-C-D model
3 rd	Start by recalling the assignment of the last session, helping members to become aware of the role of ideas and beliefs in creating the problem. To create awareness of how anxiety is formed
4 th	Mention examples of life events and group discussions on how beliefs affect the well-being and mental health, teaching the principles of A&C-DC, examining the role of irrational do's and don'ts in creating problems and homework
5 th	To teach how to recognize and control frustrating, pessimistic, dysfunctional, and anxious thoughts. Teaching methods of arguing with irrational beliefs through role-playing and homework
6 th	To change and eliminate wrong beliefs and replace the beliefs and to recognize correctly according to the A-B-C-D model Teaching methods of arguing with irrational beliefs through emotional rational imagery, homework, and termination.
7 th	To recognize unpleasant emotions and change them Through training and implementation of cognitive, emotional and behavioral techniques such as relaxation, attack against shame, joke, self-management, meanings of expression, task and termination.
8 th	To work on dysfunctional behaviors to change them according to the A-B-C-D model and teaching cognitive, emotional, and behavioral management techniques
9 th	To teach the problem-solving method Through relaxation, attack against shame and jokes. practical exercises
10 th	To present programs to perpetuate the achievements Teaching ways to prevent mental problems, doing practical exercises in a group and summarizing and concluding by group members, appreciation and thanks, Khaimeh.

The REBT protocol is prepared based on a step-by-step guide to REBT by Wendy Dryden (2011).

Analysis of covariance is used in this study based on the type of this research. All analyses of this study were performed using IBM SPSS Statistics Student Version 18.0.

Results

Table 2 displays descriptive indices related to the demographic factors of the sample under study, including sex, education, and age.

Chi-squared test was performed to examine the homogeneity of groups in terms of sex and education, and since the significance levels of the tests are more than 0.05, it can be concluded that there is not a significant difference between the frequencies of different sexes and educational levels and control and experimental groups were homogenous regarding these variables. One-way analysis of variance was performed to evaluate the homogeneity of the groups in terms of age variable. The result showed that

Table 2. Descriptive indices related to the demographic factors of the sample under study

Variable	Levels	Groups		Mean	SD
		REBT	Control		
Sex *	Male	5	6		
	Female	5	4		
	Total	10	10		
Education **	High school diploma	4	3		
	A.A.	1	1		
	B.A.	3	4		
	M.A.	1	1		
	Ph.D.	1	1		
	Total	10	10		
Age ***	Groups	Min	Max		
	REBT	19	48	32.90	10.06
	Control	18	49	33.10	11.12

* $\chi^2=3.581$, $P=0.31$ ** $\chi^2=3.067$, $P=0.995$ ** $F=0.169$, $P=0.917$

because significance levels of the tests were greater than 0.05, there was no significant difference between the groups in terms of age. therefore, the experimental and control groups were homogeneous regarding age. Table 3 shows the descriptive indices of central tendency and dispersion of distress, depression, and anxiety pre-test and post-test scores of patients in REBT

and control groups. According to this table, the scores of all subscales of the REBT decreased in the post-test. This can indicate the effect of therapeutic interventions on reducing patients' distress, depression, and anxiety. Its significance is examined in the hypothesis testing section.

Table 4 shows the results of the F-tests, which can

Table 3. Descriptive indices related to distress, depression, and anxiety pre-test and post-test scores of patients in REBT and control groups

Variable	Conditions	REBT		Control	
		Mean	SD	Mean	SD
Distress	Pre-test	26.20	5.77	27.40	5.66
	Post-test	11.00	1.70	29.80	4.94
Depression	Pre-test	25.20	6.48	27.00	4.55
	Post-test	10.00	1.63	27.80	4.47
Anxiety	Pre-test	28.40	6.10	26.00	6.67
	Post-test	11.40	2.67	28.40	6.10

Table 4. Results of subject's effect tests

Dependent variables (post-test scores)	Sum of squares	Degree of freedom	Mean square	F	Significance level	Partial eta squared
Distress	2688.187	1	2688.187	76.182	0.001	0.874
Depression	1.663	1	1.663	70.481	0.001	0.865
Anxiety	0.047	1	0.047	42.951	0.001	0.796

be used to examine the effects on the subjects. These tests examine the significance of the effect of the independent variable on each dependent variable (post-test scores) separately after controlling the effect of covariate variables (pre-tests). The results of this table show that there is a statistically significant difference among all dependent variables in the REBT group because their significance level is smaller than 0.05. In other words, when the effect of pre-test means is controlled, there is a significant difference among the REBT and control groups concerning distress ($F = 76.182, p = 0.001, \eta^2 = 0.874$), depression ($F = 70.481, p = 0.001, \eta^2 = 0.865$), and anxiety ($F = 42.951, p = 0.001, \eta^2 = 0.796$). It can also be concluded from the coefficients of the partial eta squared that the effect of this difference is large (Cohen, 1988). In other words, the efficacy percentages of the independent variable group in explaining the dispersion observed in the distress variable, depression scores, and anxiety variable were 87.4, 86.5, and 79.6, respectively.

Discussion and conclusion

The aim of this study was to investigate the effect of emotional rational behavior therapy on reducing anxiety, depression, and distress in people with anxiety disorder. The results of the analysis of covariance showed that REBT is effective in reducing anxiety, depression, and distress. The findings of the present study are in line with the findings of Vīslā et al. (2016), Otlean et al. (2017), Culhane and Watson (2003), DiGiuseppe et al. (2018), Hyland et al. (2014), and Eifediyi, Ojugo, and Aluede (2017).

Regarding the efficacy of REBT education in reducing psychological problems, it can be said that this approach emphasizes the thought processes related to behavior and feelings that are associated with psychological and emotional problems. People in the therapy group are encouraged to change their thoughts about personal experiences and behavior change, and this changes the individuals' feelings about themselves. REBT emphasizes the need to replace people's irrational beliefs with rational ones and provides solutions during the treatment process to help the individual identify dysfunctional thought patterns that lead to feelings of inadequacy and replace them with rational

and functional thought patterns. Adolescents who undergo this group education experience increased happiness by replacing irrational and dysfunctional beliefs with rational and functional ones, resulting in a shift from negative to positive emotions (Dobson & Strawn, 2016).

It can also be said that what defines human and gives meaning to his life and behavior are his beliefs and how he looks at events. Man is what he thinks. He deals with issues based on his beliefs and how he defines life, and individuals deal with a common accident differently according to their knowledge and beliefs, and this important thing is often taught by the family and social interactions. People sometimes are so enclosed in irrational "musts" and "necessities" that they cannot enjoy their current lives. Sometimes, they do not even realize that what hinders their vitality is themselves, not external factors. Since many of these beliefs are irrational and unreasonable, they negatively affect people's lives and cause depression and tension. For example, depression is one of the disorders that affect many people every year and it is rooted in negative and morbid thoughts and beliefs. This disorder distorts one's view of oneself, others, and the world, weakens one's judgment, and leads to unreasonable behaviors. A depressed person cannot lead a normal daily life, and almost all aspects of life, from concentration at work to sleep at night, are affected by depression (Trip, Vernon, & McMahon, 2007).

People choose irrational and unreasonable goals because of irrational perceptions of themselves that lead to feelings of worthlessness, and as a result, they feel inefficient when they cannot achieve their goals. REBT acknowledges the existence of irrational beliefs in the individual and emphasizes the need to replace irrational beliefs with rational ones (Dryden, 2011). Moreover, the way people think and interpret life events and situations plays an essential role in the occurrence of their psychological problems and irrational thoughts cause emotional disturbances such as stress and depression.

Given that practicing is an exercise in coping with problematic and challenging situations in real life that increases the effectiveness of treatment, it is important to assign practices in education sessions and

to continue practicing at home. Cognitive techniques are identifying and challenging irrational thinking, seeking help to find alternative ways of thinking. These techniques lead to a change in behavioral and emotional reactions by changing and transforming the belief system of the individual, which enables the person to correctly understand and interpret the truth. REBT enables people to face the challenges and unpleasant experiences of life adaptively and realistically by recognizing their irrational beliefs and challenging these thoughts and replacing them with realistic thoughts, as well as experiencing functional and effective emotions.

According to this approach, many people unconsciously believe that life should go on without a challenge which is considered intolerable. In this regard, the REBT-based intervention tries to question this general belief and then lead people to the view that different challenges in life are inevitable, and although challenges are somewhat stressful and require effort and preparation, it is not rational to think that they are unbearable or should not exist (Connor & Davidson, 2003). Thus, REBT increases distress tolerance and reduces emotional problems such as depression and anxiety in three stages: 1. putting aside this general belief that life challenges are unbearable and catastrophic; 2. accepting life challenges and mild negative emotions accompany them as a reality of life and perceive them as tolerable; 3. teaching behavioral skills to strengthen problem-solving abilities and the ability to deal realistically with solvable challenges. The limitations of the present study can be the lack of adequate time for training, the researcher's lack of communication with the clients' families, the impossibility of random sampling, the lack of selection of subjects based on their general health level (existing research subjects may already be The intervention also had high public health), and the impossibility of experimental control of irrelevant variables.

Based on the findings, it is recommended that future research screen the subjects based on the levels of their psychological problems. Future research can also determine the number of group therapy sessions based on the subjects' progress so that the subjects who progress more leave the treatment sessions sooner

and the therapist focuses on the subjects who progress more slowly. Moreover, the effectiveness of REBT in reducing anxiety and treatment progress of patients with emotional problems in low, medium, and high socioeconomic classes can be compared.

References

- Abolghasemi, A., Mikaeili, N., Khoshnoodnia Chomachaei, B., & Karimi Yousefi, S. H. (2018). Effectiveness of Cognitive Therapy on Emotional Distress and Stress Coping Strategies in Patients with Multiple Sclerosis. *Biquarterly Iranian Journal of Health Psychology*, 1(1), 29-36.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders*. 5th edition. Washington D.C: Author.
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological assessment*, 10(2), 176.
- Ashayeri, H., Hooman, H., Jamali Firoozabadi, M., Watankhah, H. (2009). The effectiveness of desensitization treatments through eye movement and reprocessing, drug therapy, and cognitive therapy in reducing anxiety symptoms. *Psychological Research*, 1 (3), 51-63.
- Balkis, M., & Duru, E. (2018). The Protective Role of Rational Beliefs on the Relationship Between Irrational Beliefs, the Emotional States of Stress, Depression, and Anxiety. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 1 (4), 1-17.
- Beck, A.T. (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *American Journal of Psychiatry* 165, 969-977.
- Besharat MA (2005). [Psychometric properties of Depression Anxiety Stress Scale (DASS-21) in clinical and general population]. Research Report. The University of Tehran. Roshd Publications
- Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behavior research and therapy*, 35(1), 79-89.
- Buschmann, T., Horn, R. A., Blankenship, V. R., Garcia, Y. E., & Bohan, K. B. (2018). The Relationship Between Automatic Thoughts and Irrational Beliefs Predicting Anxiety and Depression. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 36(2), 137-162.
- Caserta, D. A., Dowd, E. T., David, D., & Ellis, A. (2010).

- Rational and irrational beliefs in primary prevention and mental health. In D. David, S. J. Lynn, & A. Ellis (Eds.), *Rational and irrational beliefs: Research, theory, and clinical practice* (pp. 173–194). New York: Oxford University Press
- Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and anxiety*, 18(2), 76-82.
- Culhane, S. E., & Watson, P. J. (2003). Alexithymia, irrational beliefs, and the rational-emotive explanation of emotional disturbance. *Journal of Rational-Emotive and Cognitive Behavior Therapy*, 21, 57–73.
- David, D. (2014). Rational emotive behavior therapy. New York: *Oxford University Press*.
- David, D., Lynn, S. J., & Ellis, A. (2010). Rational and irrational beliefs: Research, theory, and clinical practice. Oxford: *Oxford University Press*.
- David, D., Lynn, S. J., & Ellis, A. (2010). Rational and irrational beliefs: Research, theory, and clinical practice. *Oxford: Oxford University Press*.
- DiGiuseppe, R., Leaf, R., Gorman, B., & Robin, M. W. (2018). The development of a measure of irrational/rational beliefs. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 36(1), 47-79.
- Dobson, E. T., & Strawn, J. R. (2016). Placebo response in pediatric anxiety disorders: implications for clinical trial design and interpretation. *Journal of child and adolescent psychopharmacology*, 26(8), 686-693.
- Dryden, W., & Branch, R. (2008). *The fundamental of rational emotive behavior therapy*. London: Wiley.
- Eifediyi, G., Ojugo, A. I., & Aluede, O. (2017). Effectiveness of rational emotive behavior therapy in the reduction of examination Anxiety among secondary school students in Edo State, Nigeria. *Asia Pacific Journal of Counselling and Psychotherapy*;3 (1): 1-16.
- Ellis, A. (2000). How to control your anxiety before it controls you. New York: Citadel Press.
- Ellis, A. (1994). *Reason and emotion in psychotherapy* (2nd ed.). Secaucus, NJ: Birscej Lane.
- Ellis, A. (1994). Reason and Emotion in Psychotherapy. Secaucus, NJ: Birscej Lane.
- Huang CL, Wang YM, Li XW, Ren LL, Zhao JP, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395(10223):497-506.
- Hyland, P., Shevlin, M., & Adamson, G. (2014). The moderating role of irrational beliefs in the relationship between irrational beliefs and posttraumatic stress symptomology. *Behavioral and Cognitive Psychotherapy*, 42, 312–326.
- Iqbal, N., & Dar, K. A. (2015). Negative affectivity, depression, and anxiety: Does rumination mediate the links? *Journal of Affective Disorders*, 181, 18-23.
- Laceulle O.L, Marcel A.G, van Aken M. A. G, Ormel J, AND Esther Nederhof E.(2015). Stress-sensitivity and reciprocal associations between stressful events and adolescent temperament. *Personality and Individual Differences*, 81, 76-83.
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behavior research and therapy*, 33(3), 335-343.
- Mayhew, R., & Edelmann, R. J. (1989). Self-esteem, irrational beliefs, and coping strategies in relation to eating problems in a non-clinical population. *Personality and Individual Differences*, 10(5), 581–584.
- Norton, P. J. (2007). Depression Anxiety and Stress Scales (DASS-21): a psychometric analysis across four racial groups. *Anxiety, Stress & Coping*, 20, 253–265.
- Oltean, H. R., Hyland, P., Vallières, F., & David, D. O. (2017). An empirical assessment of REBT models of psychopathology and psychological health in the prediction of anxiety and depression symptoms. *Behavioral and Cognitive Psychotherapy*, 45(6), 600-615.
- Sadock, B. J., Sadock, V. A., & Ruiz, P. (2015). Synopsis of Psychiatry. Vol. 1. *Philadelphia: Wolters Kluwer*, 11, 5-473.
- Shahandeh, M, and Safarzadeh, S. (2010). Evaluation of the effectiveness of rational-emotional therapy on reducing anxiety. *Journal of Isfahan Medical School*. 28 (108), 310-315.
- Trip, S., Vernon, A., & McMahon, J. (2007). Effectiveness of rational-emotive education: a quantitative meta-analytical study. *Journal of Cognitive and Behavioral Psychotherapies*, 7(1), 81–93.
- Višlá, A., Flückiger, C., Grosse Holtforth, M., & David, D. (2016). Irrational beliefs and psychological distress: A meta-analysis. *Psychotherapy and Psychosomatics*, 85(1), 8–15.
- Wood, A. G., Barker, J. B., & Turner, M. J. (2017). Developing performance using rational emotive behavior therapy (REBT): a case study with an elite archer. *The Sport Psychologist*, 31(1), 78-87.

Predicting Perceived Social Support based on Perceived Stress and Cognitive Emotion Regulation in Patients with Ulcerative Colitis

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Abstract

Objective: The aim of present study was to predict perceived social support based on perceived stress mediated by cognitive emotion regulation in patients with ulcerative colitis.

Method: The method of study was correlational, structural equation modeling type. The statistical population of the present study included all patients with ulcerative colitis, referred to gastroenterology clinics in Districts 4 and 7 of Tehran in 2019. Among them, 261 people were selected through purposeful sampling method. The research tools included perceived social support scale (Zimet et al., 1998), perceives stress scale (Cohen et al., 1983), and cognitive emotion regulation scale (Garnefski and Kraaij, 2006).

Results: The results revealed a negative relationship between perceived stress and perceived social support ($\beta=-0.13$, $t=2.04$) and negative relationship between perceived stress and cognitive emotion regulation ($\beta=-0.21$, $t=2.96$) in patients with ulcerative colitis. A positive relationship was also found between cognitive emotion regulation and perceived social support ($\beta=0.47$, $t=7.18$) but cognitive emotion regulation had no mediating role between perceived stress and perceived social support in patients with ulcerative colitis ($\beta=0.09$, $p>0.05$).

Conclusions: Although there were direct relationships between perceived stress, perceived social support and cognitive emotion regulation but the results revealed no indirect relationship between perceived stress and perceived social support mediated by cognitive emotion regulation in patients with ulcerative colitis. Thus, paying attention to these variables helps researchers and therapists in design of appropriate therapy for Ulcerative Colitis patients.

Keywords: Mediating, Perceived Social Support, Perceived Stress, Cognitive Emotion Regulation, Ulcerative Colitis.

Introduction

Gastrointestinal disorders have a high prevalence in all communities and socio-economic groups, so that they have been reported at around 10 to 20 percent among adolescents and adults and more in women

(Agostini, Spuri Fornarini, Ercolani, & Campieri, 2016). This disorder is often associated with other

gastrointestinal disorders and causes absenteeism, social isolation and financial problems, and imposes a heavy economic pressure on the community (Aldao & Nolen-Hoeksema, 2010). About three and a half millions of visits and two million prescriptions in the United States are due to gastrointestinal disease, and about \$ 8 billion in medical expenses and \$ 25 billion annual expenses belong to irritable bowel syndrome and ulcerative colitis (Cassel, 1979). Ulcerative colitis is the second leading cause of absenteeism after cold and has the highest rate of medical visits among gastrointestinal disorders. Irritable bowel disorder and ulcerative colitis are referred to as a disease of adolescence because they occur in most people before the age of

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45 (Dalglish, Yiend, Schweizer, & Dunn, 2009). Many patients with gastrointestinal disorders, especially ulcerative colitis, have reported significant changes in their vital functions such as difficulty in sleeping, reduced energy levels, changes in appetite and body weight, which can affect the efficiency level of people (Delonge, Takis, Kompler, & Houtman, 2004). The causes of inflammatory bowel disease are largely unknown. However, the accepted hypothesis is that the disease is caused by an interaction between genetic and environmental factors.

Significant progresses have been made in identifying the genes responsible for this disease, but the environmental factors responsible for early onset of this disease and its frequent recurrences are less well known (Ditzen, Schmid, & Bernhard, 2008). Perceived stress is one of the most important environmental factors associated with inflammatory bowel disease activities and has been investigated in many studies. The term stress was first proposed by Hans Selye, who argued that the gastrointestinal tract and immune system in people are particularly responsible for life stresses (Anglers et al., 2018). However, in studies conducted by Selye, physical events, including physical injuries and harms, cold, and electric shock were defined as stressors. Wolf was the first person, who used socio-psychological formulation to explain stress. He argued that humans react not only to real experiences of dangers, but also to threat and danger signs, and in fact, during stress, psychosocial and physiological variables interact with each other and cause disorder (Gangster & Victor, 1988). Stress means pressure, coercion, and hardship, used in different languages under this title. In Persian language, the word physiological pressure is used as the equivalent of stress, which is not compatible with the exact meaning of stress, since stress affects not only psychological components, but also affects physical components. The degree to which stressful situations are present in the lives of individual is defined perceived stress (Federenko, 2006). Research has shown there is a significant deference between perceived stress among Gastrointestinal patients and healthy people ((Pasandideh & Saulekmahdi, 2019

Cognitive assessments of stress and having supportive resources that enable people to cope with environmental stress are called perceived stress

Support and good social relationships have a

significant contribution in enhancing health (Farahbakhsh, Mehrinejad, & Moazedian, 2019). It especially affects the health of patients dealing with disorders such as ulcerative colitis, since social support is very helpful in creating and fulfilling the real and emotional needs of people and belonging to the social networks of the community and mutual requirements make people feel respect, value, and affection (Glozah & Pevalin, 2014). Perceived social support causes reassurance and competencies for new experiences in people and is effective in life satisfaction. It also promotes survival and improves psychological well-being in individuals (Hood et al., 2018). However, perception of support is more important than receiving it. In other words, the perception and attitude of patients with ulcerative colitis towards received support is a more important factor than the level of support provided (Kemp et al., 2018). Perceived social support theorists believe that not all relationships people have with others are considered as social support. In other words, relationships are not sources of social support, unless people perceive them as available or appropriate resources to meet their needs (Kemp et al., 2018). Some evidence suggests that sometimes the supports given to people are either disproportionate or not provided at appropriate situations, or they provided for people in contrast to their willingness. Thus, people perception of support is more important than support itself. Scales related to perceived social support also focus on people cognitive assessments of the environment and people levels of confidence that they will be available when needed (Larsson, Löf, & Nordin, 2017).

Results of some studies suggest that the perception of social support can prevent difficult physiological complications of the disease in people, improve self-care and self-confidence, have a positive effect on the psychological, social and physical condition of people instead and can improve performance and interpersonal communication among people (Latefa, Dardas, & Muayyad, 2015). Studies have also shown

that one of the most important factors that can affect social support and quality of life is chronic diseases. Hence, the goal of treatment of diseases, especially chronic diseases, has shifted from merely the control of the disease and promoting people health to strengthening social support by reducing the effects of disease on the process of patients' lives (Lazarus, 2000). Research have shown that perceived stress in patients with ulcerative colitis is higher than that in the general population, leading to reduced emotional regulation in these people. Cognitive emotion regulation is one of the most obvious constructs that has been studied to investigate problems related to emotion processing and regulation. Cognitive emotion regulation refers to strategies used to reduce, increase, or maintain emotional experiences (Lee & Kim, 2016). Cognitive emotion regulation is an intrinsic aspect of tendencies related to emotional responses. Cognitive emotion regulation is the actions used to change or modify an emotional state. Based on the studies, people with ulcerative colitis suppress many of their emotional experiences and display higher negative emotion and social inhibition (Li et al., 2016). Emotional inhibition and negative emotion increase cortisol secretion and increase hypothalamic-pituitary-adrenal axis activity and impair the regulation of physiological responses to stress, all of which cause gastrointestinal symptoms (Melissa et al., 2015). Having a mature personality that has a high level of emotional cognitive regulation and prevents emotional suppression and inhibition can help a person identify the source of their problems and conflicts and try to resolve them and avoid many costs imposed on health care system (Mohamad, Alavi, Mohamad & Aun, 2016). Since the pathology of ulcerative colitis remains unknown and since there are no objective and clinically reliable symptoms and are not sometimes justifiable and understandable for patients, examining the psychological factors such as social support, perceived stress, and cognitive-emotion regulation is crucial to determine the possibility of recovery and therapeutic progress

and to determine what factors affect the patient physical, mental, and social functions (Parian & Limketkai, 2016). Since this disorder is complex and multidimensional and affects the physical condition and psychosocial and cognitive functions of these patients, different aspects of life such as social functioning, sexual functioning, physical and mental health and family-work satisfaction decrease dramatically in these patients (Pin & Spini, 2016). Many of these patients have limited daily activities and little social communication. It is due to the fact that the patient has little behavioral and cognitive reservoir in relation to his or her digestive condition and does not have the necessary flexibility to manage the condition.

Hence, anxiety caused by waiting and uncertainty are often a serious barrier to their activities. For this reason, anxiety and mood disorders are among the most common psychiatric disorders in these patients, which can highly influence the perception of disease and affect the quality of life of these patients. Moreover, since pharmacological treatment alone does not have much effect on reducing symptoms and increasing the function of gastrointestinal patients and ulcerative colitis is a functional disorder that has no specific organic cause, and given its close association with mental symptoms, one of the interventions to improve the symptoms and increase the effect of treatment and reduce treatment costs is effective psychological interventions based on the effective and modifying variables for the patient. The aim of the present study was to predict perceived social support based on perceived stress mediated by cognitive emotion regulation in patients with ulcerative colitis.

Method

Ethical Statement

This research has been approved by the research ethics committee of Hormozgan University of Medical Sciences with IR.HUMS.REC.1398.315 code.

Participating in this research was optional and all participants were free to quit any time. The identities of the participants in this research were ethically confidential.

Participants and procedure

The present study is descriptive-correlational, type of structural equation modeling. The statistical population of this study consisted of all patients with ulcerative colitis referred to gastrointestinal clinics in districts 4 and 7 of Tehran in 2019. Purposeful sampling method was used in this study. In structural equation modeling, the sample size can be determined between 5 and 15 observations per measured variable: $5q \leq n \leq 15q$, where q is the number of observed variables or the number of items (questions) of the questionnaire and n is the sample size (Hooman, 2005).

In the present study, the sample size for each question was considered to be 5 people and a total of 241 people were considered in this study. However, since many of the questionnaires might be answered incompletely, 270 participants were included in the study, and finally 261 questionnaires completed by the participants were fully returned to the researcher. Inclusion criteria of the study included 1) having the minimum literacy to understand the questions of the questionnaire, 2) diagnosis of ulcerative colitis based on the opinion of a gastroenterologist and according to the results of endoscopic, histological and radiological examinations. Exclusion criteria also included 1) not answering more than 10% of the questions of the questionnaires 2) unwillingness of patients to continue to participate in the study.

Instruments

The Multidimensional Scale of Perceived Social Support (Zimet et al., 1988): It provides a subjective assessment of the level of social support in individuals. This scale was designed by Zimet et al. (1988) to assess the level of perceived social support by friends, family members, and important

individuals in one's life. It is a self-report tool used in situations, where subjects are faced with time constraints or when a researcher wants to determine a limited time for answering. The whole scale includes 12 items scored on a 7-point Likert scale from strongly disagree to strongly agree. The total score of the questionnaire is obtained by summing up of the scores of the items. In this scale, higher scores of the subjects indicate higher perceived social support. In addition, by summing up of the subjects' scores in the items of each subscale, the scores of each person in each of the three subscales of support of friends, support of family and support of important people in life are determined. In this scale, the minimum score is 12 and the maximum score is 84. High scores indicate a high level of perceived social support (Rezaie et al., 2017). Rothrock et al. (2010) reported the Cronbach's alpha coefficient of three dimensions of social support received from family, friends and important people in life at 0.89, 0.86 and 0.82, respectively. In this research Cronbach's alpha has been reported between 0.79 to 0.89.

Cohen Perceived Stress: This questionnaire was developed by Cohen in 1983 and has 3 versions, including 4-item, 10-item, and 14-item versions. It is used to assess general perceived stress over the past month. This form assesses thoughts and feelings about stressful events, controlling, overcoming, coping with stress, and experiencing stress by examining the answers. A score of 0 (never), 1 (almost never), sometimes (2), often (3), or 4 (most of the time) is given to each item of it on a five-point Likert scale. Questions 4, 5, 6, 7, 9, 10 and 13 are scored reversely (never = 4 to most of the time = 0). A cut-off score of 21.8 and a higher score indicate higher perceived stress. Cronbach's alpha for this scale was obtained at 0.84, 0.85 and 0.86 in three studies (Singh et al., 2015). In current study Cronbach's alpha was 0.77.

The Garnefski and Kraaij Cognitive Emotion Regulation Questionnaire: Garnefski and Kraaij Cognitive Emotion Regulation Questionnaire

(2006) is an 18-item tool that assesses self-regulatory strategies in response to life-threatening and stressful events on a five-point scale ranging from never to always in terms of the following 9 subscales: self-blame, blaming others, rumination, catastrophizing, positive focusing, refocusing on planning, positive reappraisal, putting into perspective, and acceptance. A higher score in each subscale indicates that the person uses more cognitive strategy. The alpha coefficient for the subscales of this questionnaire ranged from 0.71 to 0.81 and the reliability coefficient of its subscales was reported at 0.48 to 0.61 using test-retest method with 4-month interval (Strazdins & Broom, 2008). In Iran, the alpha coefficient for subscales of this test has been reported in the range of 0.62 to 0.91 (Tortella-Feliu, Balle, & Sese, 2010). In this study Cronbach's alpha was 0.79.

The data obtained from the implementation of the questionnaires were analyzed using Spss-V23 and Amos-V8.8 software. Structural equation modeling was also used to test the research hypotheses

Results

Demographic variables of the samples are presented in Table 1.

The results of Table 2 show that among the dimensions

standardized mode along with some of the most important initial model path analysis fit indices are presented in the following figure and table.

The results of Table 3 show that perceived stress had a direct effect on perceived social support, the relationship between perceived stress and perceived social support was direct ($t = 2.04$ and $\beta = -0.13$). Thus, the direct effect of perceived stress on perceived social support of patients with ulcerative colitis is confirmed with 95% confidence. The effect of perceived stress on cognitive emotion regulation was direct and the relationship between perceived stress and cognitive emotion regulation was also direct ($t = 2.96$ and $\beta = -0.21$). Thus, the direct effect of perceived stress on cognitive emotion regulation in patients with ulcerative colitis is confirmed with 95% confidence. Cognitive emotion regulation factors have a direct effect on perceived social support and the relationship between cognitive emotion regulation and perceived social support is direct ($t = 7.18$ and $\beta = 0.47$). Therefore, the direct effect of cognitive emotion regulation on perceived social support of patients with ulcerative colitis is confirmed with 95% confidence.

The results of Table 4 show that the relationship despite the indirect effect of perceived stress on the perceived social

Table 1. Frequency and percentage of frequency of individual and demographic characteristics of samples

Individual and demographic characteristics	Sub-group	n	%	Mode
Gender	Female	147	56.32	Female
	Male	114	43.68	
Age group	35-45 years	76	29.12	46-55 years
	46-55 years	102	39.08	
	56-65 years	83	31.80	
Education	Diploma	109	41.76	Diploma and Bachelor
	Associate	59	22.61	
	Bachelor	78	29.89	
	Master and higher	15	5.75	

of cognitive emotion regulation, the highest mean belonged to planning. The results of implementation of the model in the standardized mode and non-

support of patients with ulcerative colitis mediated by cognitive emotion regulation is rejected with 95% confidence ($P < 0.5$).

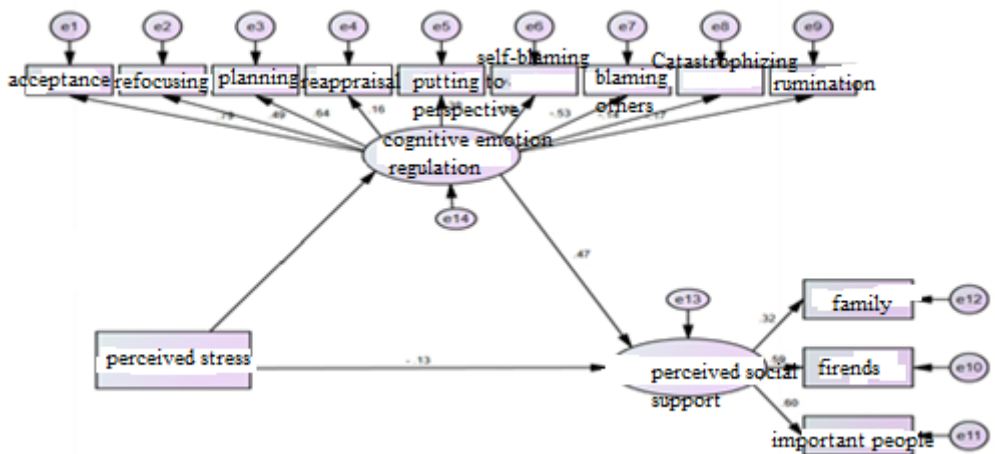
Table 2. Descriptive results of subscales of perceived stress, cognitive emotion regulation, and perceived social support.

Scale statistical indices	Mean	SD	Skewness	Kurtosis
Perceived stress	20.36	4.11	0.67	6.41
Self-blame	5.67	1.48	0.50	-0.79
Blaming others	6.02	1.33	-1.27	0.59
Catastrophizing	6.87	1.64	-0.28	-1.08
Rumination	6.34	1.08	-2.54	7.36
Acceptance	6.06	1.33	-0.74	0.58
Positive refocusing	6.19	1.48	-0.37	-0.99
planning	6.74	1.52	-.094	-0.43
Positive reappraisal	5.54	1.07	2.90	8.85
Putting to perspective	6.10	1.30	-1.86	2.01
Support of family	12.70	3.69	-1.14	0.09
Support of friends	14.68	1.19	-2.75	2.95
Support of important people in life	13.44	2.77	-1.63	1.89
Perceived social support	40.82	5.66	-1.24	1.69

Figure 1. Model in non-standardized coefficients mode.



Figure 2. Model in standardized coefficients mode.



Discussion and Conclusion

The aim of present study was to develop a structural model for predicting perceived social support based on perceived stress with a mediating role of cognitive emotion regulation in patients with ulcerative colitis. The results showed that the hypothesis of perceived stress has a direct effect on perceived social support of patients with ulcerative colitis was confirmed with 95% confidence. Stress refers to a wide range of problems that disrupt a person's mental and physical system, but this response depends on how the person interprets or evaluates the significance of the harmful, threatening, or challenging event (Trindade, Ferreira, & Pinto-Gouveia, 2015). Many researchers believe that people who are member of an extensive social support network are less likely to be harmed by stressful events. In this regard, it is generally believed that existing supportive and natural systems, such as families, work groups, and communities, facilitate coping strategies. It has been assumed that social support to act as a mediator between the life pressures and physical condition. In the present study, results revealed that social support is effective in reducing stress in patients with ulcerative colitis and with increasing social support, the level of stress in these people decreases. Results of the present study are in line with those of the studies conducted by Strazdins and Broom (Wang & Saudino, 2011). These results can be explained by the fact that patients with ulcerative colitis experience increased emotion when faced with daily stressful situations, which increases

their stress. The strategies used by patients with ulcerative colitis to reduce their negative emotions can exacerbate the emotions and lead to a kind of emotional dysregulation.

Wang and Saudino argue that emotion regulation is responsible for regulating the arousal and manifestation of emotions that arise when facing an internal and external environmental stresses. Accordingly, patients with ulcerative colitis try to reduce their emotions, especially their negative emotions. However, suppressing and preventing the expression of emotions, especially negative emotions, exacerbate them (Wang et al., 2016). Theories of emotional regulation of psychological traumas claim that the inability to apply emotion regulation strategies leads to negative emotions that are uncontrollable, severe, and chronic and they might result in psychological traumas. Also, researchers have stated that emotion expression is associated with improved psychological stress. Some experts believe that reviewing emotions over a period of time makes events more meaningful, and help them better process the desired experience and related emotions (Wong, Wu, Gregorich, & Pérez-Stable, 2014). Perceived social support plays a major role in emotional regulation and also the support of family, friends, peers and others plays an important role in the lives of these patients. The results revealed that despite the indirect effect of perceived stress on perceived social support mediated by cognitive emotion regulation in patients with ulcerative colitis is

Table 3. Coefficients and significance of the direct effect of perceived stress on perceived social support.

Criterion variable	Predictor variable	Effect type	Non-standardized coefficients	β standardized	Significance statistic	Sig.
Perceived social support	Perceived stress	direct	-0.04	-0.13	2.04	0.03
Cognitive-emotion regulation	Perceived stress	direct	-0.06	-0.21	2.96	0.002
Perceived social support	Cognitive-emotion regulation	direct	0.48	0.47	7.18	0.001

Table 4. Coefficients and significance of the non-direct effect of perceived stress on perceived social support.

Criterion variable	Predictor variable	Effect type	Non-standardized coefficients	β standardized	Significance statistic	Sig.
Perceived social support	perceived stress	mediated by cognitive emotion regulation	-0.03	-0.09	1.72	0.09

rejected with 95% confidence.

Consistent with the results of present study, Wongpakaran, Wongpakaran, and Ruktrakul (2011) carried out a study entitled “investigating the relationship between stress and irritable bowel syndrome”. The results revealed a significant relationship between stress and irritable bowel syndrome. The level and severity of life stress in the group of patients with irritable bowel syndrome was higher, compared to control group.

Other results showed that spouse death caused the highest stress among the 65 stressful life events of patients with irritable bowel syndrome and the lowest stress belonged to incidence of mild physical illness. Also, the highest frequency of stress in this group belong to an increase in living costs, as 50% of patients reported an increase in living costs as one of the most common stresses in their lives. Thus, negative psychological stress and stressful life events are an important component in patients with irritable bowel syndrome, which should be considered in planning and treatment strategies. The results of some studies have also shown that lack of support makes a person vulnerable to psychological consequences such as stress. Perceived support, as an important variable of the social system in critical situations, helps a person reduce stress and causes emotional regulation, so that the lack of support in these stressful situations and disease impose much pressure on the person and cause psychological consequences such as stress and reduced emotional regulation and make a person highly vulnerable to stress. Perceived social support and perceiving the grief and condition of patients make it easier for people to cope with their problem and accept

their condition. This acceptance and perception by family, friends and others reduces negative thoughts, isolation, and rumination, and stress (Xie et al., 2017). Eventually, the results of this research in line with the research literature indicate that perceived social support, perceived stress and emotional regulation in patients with ulcerative colitis are related to each other directly but emotional regulation has no mediating role between perceived stress and perceived social support among ulcerative colitis patients. Increasing perceived social support and cognitive emotion regulation can lead to improved interpersonal relationships of patients with ulcerative colitis with others and thus enhance their perceived support. In addition, regulating emotions can improve individual experiences such as reducing physical symptoms and improving physical health by improving bodily emotions and managing negative emotions.

limitations

One of the limitations of the present study is the use of self-report questionnaires that may result in biased answers. Also, variables such as socioeconomic status, interpersonal and family conflicts, and participants' other diseases are among the factors that might be influential factors, which were not controlled in this study. Thus, based on the results of this study and confirmed relationship between stress and ulcerative colitis and the undeniable role and influence of psychological factors and psychiatric disorders in functional gastrointestinal diseases, it is recommended for these patients visit psychologists or counselors, whenever the symptoms in patients with functional gastrointestinal diseases last or their body does not respond well to medications. Also, the use of stress

reduction techniques such as relaxation, social support, breathing exercises, regular exercise, meditation, hypnosis and biofeedback is recommended in this regard.

References

- Agostini, A., Spuri Fornarini, G., Ercolani, M., & Campieri, M. (2016). Attachment and perceived stress in patients with ulcerative colitis, a case-control study. *Journal of Psychiatric and Mental Health Nursing*, 23(9-10), 561-567. <https://doi.org/10.1111/jpm.12331>
- Aldao, A., & Nolen-Hoeksema, S. (2010). Specificity of cognitive emotion regulation strategies: A Trans diagnostic examination. *Behavior Research and Therapy*, 48, 974-983. <https://doi.org/10.1016/j.brat.2010.06.002>
- Cassel, J. (1979). The contribution of the social environment to host resistance. *American Journal of Epidemiology*, 104, 107-125. <https://doi.org/10.1093/oxfordjournals.aje.a112281>
- Dalgleish, T., Yiend, J., Schweizer, S., & Dunn, B. D. (2009). Ironic effects of emotion suppression when recounting distressing memories. *Emotion*, 9(5), 744. <https://doi.org/10.1037/a0017290>
- Delonge, A. Takis, T., Kompler, M., Houtman, I. (2004). Longitudinal research and the demand control – support model. *Journal of Occupational Health Psychology*, 18, 282-305. <https://doi.org/10.1037/1076-8998.8.4.282>
- Ditzen, B., Schmid, S., & Strauss, B. (2008). Adult attachment and social support interact to reduce psychological but not cortisol response to stress. *Journal of psychosomatic Research*, 64(5), 479-486. <https://doi.org/10.1016/j.jpsychores.2007.11.011>
- Engler, H., Elsenbruch, S., Rebernik, L., Köcke, J., Cramer, H., Schöls, M., & Langhorst, J. (2018). Stress burden and neuroendocrine regulation of cytokine production in patients with ulcerative colitis in remission. *Psychoneuroendocrinology*, 98, 101-107. <https://doi.org/10.1016/j.psyneuen.2018.08.009>
- Farahbakhshbeh, S., Mehri Nejad, S., moazedian, A. (2019). Predicting Self-Efficacy of Women with Breast Cancer based on Quality of Life, Religious Orientation, Resilience, Death Anxiety, Psychological Hardiness and Perceived Social Support. *Iranian Journal of Health Psychology*, 2(1), 65-78. doi: 10.30473/ijohp.2020.47518.1053
- Federenko, I., Schioltz, W., Kirschbaum, C., Bartels, M. (2006). The heritability of perceived stress. *Psychological Medicine*, 3(3), 375-385
- Gangster, D. C., Victor, B. (1988). The impact of social support on mental and physical health. *British Journal of Medical psychology*, 61, 8-17. <https://doi.org/10.1111/j.2044-8341.1988.tb02763.x>
- Garnefski, N., & Kraaij, V. (2006). Cognitive emotion regulation questionnaire-development of a short 18-item version (CERQ-short). *Personality and individual differences*, 41(6), 1045-1053.
- Glozah, F. N. & D. Pevalin. (2014). Social Support, Stress, Health, and Academic Success in Ghanaian Adolescents: a Path Analysis. *Journal of Adolescence*, 37(4), 451-460. <https://doi.org/10.1016/j.adolescence.2014.03.010>
- Hood, M. M., Wilson, R., Gorenz, A., Jedel, S., Raeisi, S., Hobfoll, S., & Keshavarzian, A. (2018). Sleep Quality in Ulcerative Colitis: Associations with Inflammation, Psychological Distress, and Quality of Life. *International journal of behavioral medicine*, 25(5), 517-525. <https://doi.org/10.1007/s12529-018-9745-9>
- Kemp, K., Dibley, L., Chauhan, U., Greveson, K., Jäghult, S., Ashton, K., et al. (2018). Second N-ECCO Consensus statements on the European nursing roles in caring for patients with Crohn's disease or ulcerative colitis. *Journal of Crohn's and Colitis*, 12(7), 760-776. <https://doi.org/10.1093/ecco-jcc/jjy020>
- Larsson, K., Lööf, L., & Nordin, K. (2017). Stress, coping and support needs of patients with ulcerative colitis or Crohn's disease: a qualitative descriptive study. *Journal of clinical nursing*, 26(5-6), 648-657. <https://doi.org/10.1111/jocn.13581>
- Latefa, A. D. & Muayyad, M. (2015). For Fathers Raising Children with Autism, Do Coping Strategies Mediate or Moderate the Relationship between Parenting Stress and Quality of Life. *Research in Developmental Disabilities*, (36), 620-629. <https://doi.org/10.1016/j.ridd.2014.10.047>
- Lazarus, R. S. (2000). *Stress appraisal and coping*. New York Springer: Publication.
- Lee, H. S., & Kim, C. (2016). Structural Equation Modeling to Assess Discrimination, Stress, Social Support, and Depression among the Elderly Women in South Korea. *Asian nursing research*, 10(3), 182-188. <https://doi.org/10.1016/j.anr.2016.06.003>
- Li, N., Wang, X. M., Jiang, L. J., Zhang, M., Li, N., Wei, Z. Z., et al. (2016). Effects of endoplasmic reticulum stress on the expression of inflammatory cytokines in patients with ulcerative colitis. *World journal of*

- gastroenterology*, 22(7), 2357. <https://doi.org/10.3748/wjg.v22.i7.2357>
- Melissa, H., Bellin, P., Joan, K., Mary, E. B., Mona, T., Laurie, C., & Arlene, M. (2015). Stress and quality of life in urban caregivers of children with poorly controlled asthma: a longitudinal analysis. *Journal of Pediatric Health Care*, 29(6), 536-546. <https://doi.org/10.1016/j.pedhc.2015.04.018>
- Mohamad, N., Alavi, K., Mohamad, M. S., & Aun, N. S. M. (2016). Intergenerational Support and Intergenerational Social Support Among Elderly—A Short Review in Malaysian Context. *Procedia-Social and Behavioral Sciences*, 219, 513-519. <https://doi.org/10.1016/j.sbspro.2016.05.028>
- Parian, A., & N Limketkai, B. (2016). Dietary supplement therapies for inflammatory bowel disease: Crohn's disease and ulcerative colitis. *Current Pharmaceutical Design*, 22(2), 180-188.
- Pasandideh, M., SaulekMahdee, F. (2019). Comparison of perceived stress, emotion regulation strategies and cognitive flexibility in patients with G.I.S. diseases and normal individuals. QUARTERLY JOURNAL OF HEALTH PSYCHOLOGY, 8(29), 82-100. doi: 10.30473/hpj.2019.40179.3992 [Persian]
- Pin, S., & Spini, D. (2016). Impact of falling on social participation and social support trajectories in a middle-aged and elderly European sample. *SSM-Population Health*, 2, 382-389. <https://doi.org/10.1016/j.ssmph.2016.05.004>
- Rezaie, A., Buresi, M., Lembo, A., Lin, H., McCallum, R., Rao, S., et al. (2017). Hydrogen and methane-based breath testing in gastrointestinal disorders: the North American Consensus. *The American Journal of Gastroenterology*, 112(5), 775. <https://doi.org/10.1038/ajg.2017.46>
- Rothrock, N. E., Hays, R. D., Spritzer, K., Yount, S. E., Riley, W., & Cella, D. (2010). Relative to the general US population, chronic diseases are associated with poorer health-related quality of life as measured by the Patient-Reported Outcomes Measurement Information System (PROMIS). *Journal of Clinical Epidemiology*, 63(11), 1195-1204. <https://doi.org/10.1016/j.jclinepi.2010.04.012>
- Singh, P., Staller, K., Barshop, K., Dai, E., Newman, J., Yoon, S., et al. (2015). Patients with irritable bowel syndrome-diarrhea have lower disease-specific quality of life than irritable bowel syndrome-constipation. *World Journal of Gastroenterology: WJG*, 21(26), 8103. <https://doi.org/10.3748/wjg.v21.i26.8103>
- Strazdins, L., & Broom, D. (2008). The mental health costs and benefits of giving social support. *International Journal of Stress Management*, 14(4), 370-385. <https://doi.org/10.1037/1072-5245.14.4.370>
- Tortella-Feliu, M., Balle, M., & Sese, A. (2010). Relationships between negative affectivity, emotion regulation, anxiety, and depressive symptoms in adolescents as examined through structural equation modeling. *Journal of Anxiety Disorders*, 24, 686-693.
- Trindade, I. A., Ferreira, C., & Pinto-Gouveia, J. (2015). Ulcerative colitis symptomatology and depression: the exacerbator role of maladaptive psychological processes. *Digestive diseases and sciences*, 60(12), 3756-3763.
- Wang, M., & Saudino, K. J. (2011). Emotion regulation and stress. *Journal of Adult Development*, 18(2), 95-103.
- Wang, Z., Li, S., Cao, Y., Tian, X., Zeng, R., Liao, D. F., & Cao, D. (2016). Oxidative stress and carbonyl lesions in ulcerative colitis and associated colorectal cancer. *Oxidative Medicine and Cellular Longevity*, 2016, 9875298. <https://doi.org/10.1155/2016/9875298>
- Wong, S. T., Wu, A., Gregorich, S., & Pérez-Stable, E. J. (2014). What Type of Social Support Influences Self-Reported Physical and Mental Health Among Older Women? *Journal of aging and health*, 26(4), 663-678. <https://doi.org/10.1177/0898264314527478>
- Wongpakaran, T., Wongpakaran, N., & Ruktrakul, R. (2011). Reliability and validity of the multidimensional scale of perceived social support (MSPSS): thai version. *Clinical practice and epidemiology in mental health: CP & EMH*, 7, 161. <https://doi.org/10.2174/1745017901107010161>
- Xie, H., Peng, W., Yang, Y., Zhang, D., Sun, Y., Wu, M., et al. (2017). Social Support as a Mediator of Physical Disability and Depressive Symptoms in Chinese Elderly. *Archives of Psychiatric Nursing*, 32, 256-262. <https://doi.org/10.1016/j.apnu.2017.11.012>
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of personality assessment*, 52(1), 30-41.

Adolescents Corona Anxiety: The Relationship between Character Strengths and Family Social Support

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Abstract

Objective: The aim of this study is to determine adolescent coronary anxiety in the relationship between character strengths and family social support.

Method: The research method was correlational and the statistical population including 156 ninth and tenth grade students were selected by non-random sampling method (available) from District 4 of Tehran. Students responded to the Values in Action inventory of strength Scale of Park and Peterson (2006), Perceived Social Support- Family Scale of the Procidano & Heller (1983), and the Corona Disease Anxiety Scale of Alipour, Ghadami, Alipour, and Abdollahzadeh (2020).

Results: The results of multiple regression analysis showed that the predicting of corona mental anxiety is significant with the strengths of judgement, love of learning, honesty, zest, kindness, teamwork, forgiveness, and family social support. Predicting Corona physical anxiety, creativity, love of learning, bravery, kindness, social intelligence, teamwork, humility, hope and spirituality are significant. Love for learning, honesty, forgiveness, humility, hope, spirituality, and family social support are significant in predicting overall corona anxiety ($P < 0.05$).

Conclusions: The results showed that character strengths and social support family have an effective role in reducing corona anxiety and can provide the necessary support for adolescents in stressful situations.

Keywords: Adolescents, Corona Anxiety, Corona epidemic, Character Strengths, Social Support Family.

Introduction

An epidemic of the disease has existed throughout human history. But corona disease is so unprecedented that it has forced 4 billion people into social isolation (Sanford, 2020). The disease has affected communication, entertainment, social participation, life satisfaction and social support (Baiano, Zappullo, Group, & Conson, 2020) and has caused psychological and social problems and affected mental well-being and sleep quality (Aliakbari Dehkordi, Eisazadeh, & Agh-

janbaglu, 2019). In the study of mental health, the psychological effects of corona disease are increasing (Nobles, Martin, Dawson, Moran, & Savovic, 2020). Anxiety and psychological symptoms occur among children and adolescents due to the loss of curricula, lack of access to educational facilities and educational tools (Chawla, Sharma, & Sagar, 2020). Corona disease has many biological, emotional and physical aspects and has cultural and social consequences on children and adolescents (Dalton, Rapa, & Stein, 2020). Therefore, their well-being and problems during and after corona disease should not be forgotten. Such consequences are not limited to their health and well-being, but also affect other aspects of their lives, such as security, education and poverty (Joseph, 2020). Casali, Feraco, Ghisi, & Meneghetti (2020) showed

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signs of anxiety and depression in infectious diseases. One of the most common problems in childhood and adolescence is anxiety disorders that are associated with excessive fear, anxiety and behavioral symptoms (Alilou, Khanjani and Bayat, 2016). Feeling anxious, irritable, and helpless is logical in a catastrophe like a comprehensive and contagious disease (Shuchman, 2020). In the meantime, character strengths are like a shield against disease. Character strengths are positive traits in a person's feelings, behavior, and thoughts that include 24 strengths (Creativity, Curiosity, Judgement, Love of Learning, Perspective, Bravery, Perseverance, Honesty, Zest, Love, Kindness, Social Intelligence, Teamwork, Fairness, Leadership, Forgiveness, Humility, Prudence, Self-Regulation, Appreciation of Beauty and Excellence, Gratitude, Hope, Humor, Religiousness) and six virtues (wisdom and knowledge, courage, humanity, justice, temperance and transcendence). Which were presented by Peterson and Seligman (2004) in a coherent model of Values in Action (VIA) and the Classification of Character Strengths and Virtues (CSV).

Character strengths support the well-being of individuals as personal assets, especially in challenging situations. Niemiec (2019) points out that character strengths have three "adversity functions" that enable a person to grow in difficult conditions. buffering; Using character strengths can be a shield against problems (before adversity), reappraisal; Character strengths can help explain or interpret problems (during adversity) and Resilience; Character strengths support recovery and promotion (after adversity). Character strengths are traits that are ubiquitous, as opposed to anxiety and fear, which create feelings of loneliness. In general, it strengthens the sense of efficiency and self-confidence (Niemiec & McGrath, 2019).

The strengths of hope play a key role in the field of psychological problems. Hope, zest and leadership are associated with less anxiety and depression. Hope is negatively related to indicators of psychological anxiety and school maladaptation (Niemiec, 2013). Perseverance, Honesty, Prudence and love are less associ-

ated with externalization problems such as aggression (Park and Peterson, 2008). In addition to character strengths, family social support is another factor that plays a protective role against problems during adolescence. Social support is the possibilities that others create for the individual and create the awareness that the individual is respected and valued. Family social support is especially important during adolescence, which is associated with developmental changes (Jafari, Mohtashami, Alaei Karroudi, Mansouri and Rasouli, 2016). Adolescence is a critical period in a person's life in which poor mental health can jeopardize the development and potential future of adolescents (Wambua, Obondo, & Kumar, 2018).

Increased psychological symptoms of anxiety and depression have been reported worldwide, and hence, adolescent mental health concerns have increased (Dalen, Dierckx, Pasmans, & Aendekerk, 2020). Zhang, Liu, Jiang, Wu, & Tian (2020) stated that adolescents are more vulnerable when exposed to traumatic events, and corona disease can be a stressful factor for adolescents. Family social support can be one of the most common forms of adolescent support in such situations (Meng, Shuang-Jiang, Zhao-Chang, Li-Gang, & Hong-Jie, 2020). Support network is one of the most important resources to deal with change and has positive effects on adolescent development. Family-supported adolescents use more effective coping strategies and have positive effects on adolescent adjustment. While lack of family support is a risk factor in adolescent psychological problems (Hombros-Mendieta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leiva, and Castro-Trave, 2012).

Due to the prevalence of corona disease and its changes in the personal, social, family and educational environment of adolescents and the resulting anxiety can be critical to adolescent mental health (Zhang, 2014). Therefore, it is necessary to pay more attention to individual positive factors and adolescent family social support. Character strengths with a focus on the positive aspects can help adolescents reduce worry, anxiety, and reassess problems (Rashid and McGrath,

2020) and influence recovery and promotion (Niemiec, 2019). In addition to strengths, it is important to pay attention to the social support of the family, because the family can have adaptive effects against the adolescent's psychological problems (Hombrados-Mendieta, et, al, 2012). This research seeks to consider adolescents' anxiety than corona disease according to their character strengths and family social support, how positive experiences and family social support prevent the psychological problems of adolescents' anxiety about Corona.

Method

The research method is correlational. Due to corona conditions, students responded to the questionnaires using WhatsApp available sampling method.

Statistical population, sample

The statistical population included ninth and tenth grade female students studying in Tehran's 4th district in the academic year of 2020- 2021. The statistical sample consisted of 156 students with a mean age of 15/66. Inclusion criteria, adolescents studying, not having specific psychological problems (according to the subject's comments, the school deputy and the teachers, whose similarity between the statements was the criterion), living with both parents and the criterion for leaving was not answering the questions of the questionnaire.

According to the subject's comments, the school deputy and the teachers, whose similarity between the statements was the criterion

Ethical statement

Initially, informed consent was obtained from students and they were assured that their information would be confidential. The purpose of the study was explained to them. They had the right to withdraw from the study.

Research instruments

Values in Action Inventory of Strengths scale (VIA-Youth): Inventory of 96 item of the summary form of the 198 scales of Park and Peterson (2006), which is suitable for the age group of 10 to 18 years. The scale contains 4 items for each strength and on the Likert

scale, 5 options are scored from very similar to me (5 points) to not at all like me (1 point). The scale has 24 strengths and six virtues. Scoring some questions is the opposite. Due to ethical considerations and the request of the American Positive Psychology site not to publish how to score, you can refer to the positive psychology site¹. McGrath and Walker (2016) state that the mean correlation between the main scale and the revised strengths scale is 0.82 (range = 0.70 to 0.92). The internal consistency of the adolescent strengths scale in the positive psychology site is between 0.69 and 0.95. Park and Peterson reported the adolescent strengths scale after 6 months using the re-test method from 0.46 to 0.71. In the research of Khosrojerdi, Heidari, Ghanbari and Pakdaman (2020) the scale was translated into Persian and re-translated and after confirming the accuracy of the translation was confirmed by expert and the concept of scale materials, it was prepared for implementation. In the study of psychometric properties of Cronbach's alpha by retest method from 0.60 to 0.97. The correlation coefficient of virtues and strengths with a time interval of 15 days is from 0.49 to 0.97. Convergent validity is the scale of character strengths with happiness from 0.14 to 0.57. The correlation coefficient of strengths and virtues with a time interval of 15 days was from 0.49 to 0.97. Convergent validity is the scale of character strengths with happiness and self-efficacy from 0.14 to 0.57. Virtues, wisdom, courage, humanity, justice, temperance and transcendence in confirmatory factor analysis of CMIN/DF, is from 1.74 to 3.85, of CFI from 0.90 to 0.95, of PCFI is from 0.67 to 0.78 and of RMSEA is from 0.04 to 0.82. In the present study, Cronbach's alpha for 24 strengths is 0.92.

Perceived Social Support- Family Scale (PSSFS): The questionnaire was developed by Procidano & Heller (1983). The scale has 20 items that are about perceptions, experiences and feelings that one has about the family. The scale has three options Yes (1), No (0) and I do not know (0). In questions 3, 4, 16, 19, 20, the

1- www.viacharacter.org

answer is no, the score is 1 and yes, the score is zero. Scores range from zero to 20. A higher score means more support. Procidano and Heller (1983) reported scale reliability with a one-month intervals of 0.83 and internal consistency of 0.90. Kazemi et al. (2018, quoting Bigler Mazlaghani and Gholami Afshar, 2019) reported with using structural method and exploratory factor analysis the KMO higher than 0.7 and its reliability 0.90. In the research of BiglarmeZlaghani and Gholami-Fasharaki (2019), its reliability was reported to be 0.92.

the Corona Disease Anxiety Scale (CDAS): The scale is made by Alipour, Ghadami, Alipour and Abdollahzadeh (2020). The 18-item scale has two factors. Questions 1 to 9 measure psychological symptoms and questions 10 to 18 measure physical symptoms. The instrument is scored in a 4-point Likert scale (never = 0, sometimes = 1, most of the time = 2 and always = 3). Scores range from 0 to 54. Higher scores indicate a higher level of corona anxiety in individuals.

Reliability with Cronbach's alpha for the first factor is 0.87, the second factor is 0.86 and the whole questionnaire is 0.91. The validity results with the total score of GHQ-28 questionnaire and the components of anxiety, physical symptoms, social dysfunction and depression are equal to 0.483, 0.507, 0.418, 0.333 and 0.269. In the present study, Cronbach's alpha for the first factor is 0.93, the second factor is 0.92 and the total is 0.92.

Results

Mean, standard deviation, and correlation matrix of the research variables of character strengths (12 strengths), family social support and corona anxiety for adolescents are shown in Table 1. The lowest mean of corona anxiety and the highest is teamwork and the lowest deviation standard is the spirituality and the highest is corona anxiety. Correlation coefficients between strengths and family social support are significant. But there is no significant relationship between corona anxiety with strengths and family social support.

Table 1. Mean, standard deviation and correlation matrix of research variables

Variables	M(s)	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1.Creativity	15.64(3.25)		1												
2.Judgement	16.14(3.37)	0.46**		1											
3.Love of Learning	16.11(3.58)	0.50**	0.40**		1										
4.Bravery	16.74(2.74)	0.44**	0.47**	0.44**		1									
5.Honesty	14.83(3.14)	0.19*	0.34**	0.40**	0.39**		1								
6.Zest	14.88(4.07)	0.45**	0.45**	0.62**	0.39**	0.44**		1							
7.Kindness	16.80(2.66)	0.26**	0.50**	0.35**	0.45**	0.28**	0.39**		1						
8.Social Intelligence	16.10(2.7)	0.42**	0.48**	0.41**	0.47**	0.47**	0.55**	0.34**		1					
9.Teamwork	17.65(4.7)	0.17*	0.29**	0.23**	0.21**	0.17*	0.16*	0.24**	0.18**		1				
10.Forgiveness	15.99(3.30)	0.11	0.36**	0.19*	0.37**	0.34**	0.33**	0.47**	0.33**	0.28**		1			
11.Hope	16.28(3.22)	0.41**	0.47**	0.64**	0.49**	0.41**	0.66**	0.41**	0.53**	0.26**	0.25**		1		
12.Religiousness	15.82(0.03)	0.44**	0.55**	0.50**	0.50**	0.43**	0.50**	0.41**	0.48**	0.26**	0.31**	0.57**		1	
13.Family	12.65(5.25)	0.26**	0.10	0.27**	0.14**	0.33**	0.32**	0.02	0.30	-0.08	0.16*	0.20*	0.19*		1
14.Anxiety	9.92(7.57)	0.05	-0.05	0.07	-0.07	-0.13	-0.02	0.11	-0.08	0.14	0.11	-0.03	0.10	0.041	

Table 2. Results of Regression Analysis for Predicting Corona Mental Anxiety Based on Character strengths and Family Social Support

Predictive variables	b	SE	B	t	sig
Judgement	-0.27	0.14	-0.18	-1.98	0.04
Love of Learning	0.26	0.14	0.19	-1.92	0.05
Honesty	-0.46	0.14	-0.29	-3.24	0.001
Zest	-0.22	0.12	-0.18	-1.72	0.08
Kindness	0.35	0.18	0.18	1.89	0.06
Teamwork	0.21	0.08	0.20	2.53	0.01
Forgiveness	0.26	0.13	0.17	1.91	0.05
Family	0.18	0.08	0.19	2.29	0.02

In Table 2, the results of analysis of variance were performed by Backward method. The analysis was performed in eighteen steps, and in the first seventeen steps, seventeen strengths were excluded from the equivalent, respectively. In the eighteen steps of judgement, the love of learning, honesty, zest, kindness, teamwork, forgiveness, and perceived social support of the family as predictor variables remained equivalent. 0.18 of the variance of criterion changes in corona mental anxiety disorder is explained by predictor variables with $f = 4.06$ at the level ($P < 0.05$) is significant. The results of regression analysis are shown in the table below.

In Table 3, the analysis was performed in seventeen steps, in the first sixteen steps, fifteen strengths and

perceived social support of the family were excluded from the equivalent. In the seventeen steps of creativity, love of learning, Bravery, kindness, social intelligence, teamwork, humility, hope and spirituality remained as predictor variables in the equation. The coefficient of determination of the remaining variables with the corona physical anxiety criterion variable is 0.87 with $f = 114.68$ at the level ($P < 0.05$). The results of regression analysis are shown in the table below.

In Table 4, the analysis was performed in nineteen steps, in the first eighteen steps, eighteen strengths were excluded from the equivalent. In step nineteen, the strengths of love of learning, Honesty, forgiveness, humility, hope, spirituality, and family social support remained as predictor variables in the equation. The

Table 3. Results of Regression Analysis to Predict Corona Physical Anxiety Based on Character strengths and Family Social Support

Predictive variables	b	SE	B	t	sig
Creativity	0.16	0.07	0.07	2.17	0.03
Love of Learning	0.81	0.07	0.44	1.07	0.001
Bravery	0.44	0.09	0.18	4.88	0.001
Kindness	0.20	0.08	-0.08	-2.35	0.001
Social Intelligence	0.24	0.09	0.10	2.70	0.008
Teamwork	-0.09	0.04	-0.06	-2.24	0.02
Humility	-0.19	0.07	-0.09	-2.70	0.008
Hope	0.69	0.08	0.34	7.81	0.001
Spirituality	0.30	0.09	0.14	3.41	0.001

Table 4. Results of regression analysis to predict total corona anxiety based on character strengths and Family social support

sig	t	B	SE	b	Predictive variables
	1.14	0.16	0.49	7.17	0.001
	0.44	0.16	0.16	-2.65	0.009
	0.36	0.14	0.14	2.57	0.01
	0.34	0.16	-0.12	-2.09	0.03
	0.59	0.18	0.23	3.22	0.002
	0.63	0.18	0.23	3.35	0.001
	0.14	0.08	0.09	1.69	0.09

coefficient of determination of the remaining variables with the corona general anxiety criterion variable is 0.63 with $f = 35.03$ at the level ($P < 0.05$). The results of regression analysis are shown in the table below.

Discussion and conclusion

The aim of this study was to determine adolescent corona anxiety in the relationship between character strengths and family social support. The results showed that there is no relationship between corona anxiety with strengths and family social support. While there is a significant relationship between family social support and love of learning, honesty, zest, forgiveness, teamwork, creativity, bravery, humility, hope and spirituality. As Niemiec (2019) points out, character strengths protect the individual in difficult situations and by re-evaluating the problems, it provides improvement and promotion for the adolescence and increases her resilience. Having strengths and positive traits strengthens one's sense of efficiency and self-confidence (Niemiec & McGrath, 2019). Explaining the results, it can be said that the existence of strengths in the adolescent and awareness of them can help him to focus on his strengths in the face of various problems and diseases, including corona disease. Focusing on strengths and hopes has a double effect on improving mental health. On the other hand, family social support during adolescence plays an impor-

tant role in dealing with stressful situation that act as a shield for adolescent, which acts as a shield for the teenager.

Niemiec (2013) suggests that hope plays a key role in the field of psychological problems. Hope, zest and Honesty are negatively related to extraversion problems and psychological anxiety indicators, which in Table 2 showed that Judgement, love of learning, Honesty, zest, kindness, teamwork, forgiveness and family social support protect adolescents against psychological anxiety. Table 3 showed that creativity, love of learning, Bravery, kindness, social intelligence, teamwork, humility, hope and spirituality are associated with physical anxiety. strengths act as assets for the individual that can provide a safe environment for adolescents along with family support towards corona anxiety and prevent from the occurrence of psychological and physical problems. strengths are positive traits in feelings, thoughts, and behaviors that emphasize positive experiences and, by accompanying the family social network, can protect adolescents against the psychological symptoms of anxiety that indicate the prevalence of corona disease (Dalen, 2020). Zhang et al. (2014) suggested that traumatic events increase adolescent vulnerability. Therefore, in explaining the results, it can be said that the emphasis on positive individual and family characteristics has a moderating

role for adolescents against corona anxiety. Paying attention to things and planning for them in anxious situations helps the adolescent to pay attention to the positive aspects that cause positive emotions in him; Therefore, his thinking and creativity increase. While paying attention to the negative and anxious aspects makes him more prone to psychological problems and injuries. In addition, the family social support has value and respect for adolescent that It plays an important role in the sense of self-respect and positive self-esteem, which is a factor against corona anxiety. Corona disease can be a stressful factor for adolescents, and family social support is one of the most common forms of adolescent support in such situations (Meng,2020). Table 4 showed that the love of learning, Honesty, forgiveness, humility, hope, spirituality, and family social support predict general coronary anxiety. Support network and strengths are one of the most important resources to deal with changes and new situations that have a positive effect on adolescent development. As Hombrados-Mendieta, et. al. (2012) suggested, the adolescents who receive the most family support use more effective coping strategies and have positive effects on adolescent adjustment and it is one of the most important resources to deal with change. In explaining the results, it can be said that paying attention to the constructive relationship between parents and adolescents in stressful situations has a significant role in reducing adolescent anxiety and worry. Improving the relationship between parents and adolescents in terms of the positive aspects of life and the right conditions despite corona disease is a strong encouragement and reassurance for adolescents.

The character strengths and family social support are shielded against stressful situations such as corona disease during adolescence. Therefore, For the generalizability of such research, it is essential that adolescence be fully covered and that boys be included. On the other hand, paying attention to the different cultures of the country may include other strengths. Paying attention to character strengths, in addition to the protective role it plays for a person in stressful situations, is

also effective in a person's prosperity. Therefore, it is necessary to pay more attention to its role along with family social support in order to develop programs and interventions for adolescents in stressful situations. Adolescence is a time of development of different capacities and skills. Emphasis on strengths, in addition to its supportive role in stressful situations, provides the basis for self-acceptance, happiness and well-being of adolescents.

It is suggested that the role of gender be considered in future research. In addition, a training package based on effective strengths against Corona should be developed so that adolescents can benefit from strengths-based education versus corona. The use of strengths in parent-teacher interactions with adolescents can be a shield against corona anxiety, which is another suggestion of this study. Using a mobile application, in addition to creating an educational package, is one of the practical suggestions of the research.

References

- Aliakbari Dehkordi, M., Eisazadeh, F., and Aghjanbaglu, S. (2019). Psychological Consequences of Patients with Coronavirus (COVID- 19): A Qualitative Study, *Iranian Journal of Health Psychology*, 2 (2), 9-20. [Persian].
- Alilo, M. M., Khanjani, Z., and Bayat, A. (2015). Predicting Adolescent Anxiety-Related Emotional Disorders Based on Emotion Regulation, Coping Strategies, and Symptoms of Borderline Personality Disorders, *Journal of Clinical Psychology Studies*, 7 (25), 107-128. [Persian].
- Alipour, A., Ghadami, A., Alipour, Z., & Abdollahzadeh, H. (2020). Preliminary validation of the corona disease Anxiety Scale (CDAS) in the Iranian Sample, *Quarterly Journal of Health Psychology*, 8(4, 32), 163- 175. [Persian].
- Baiano, C., Zappullo, I., Group, T. L., & Conson, M. (2020). Tendency to Worry and Fear of Mental Health during Italy's COVID-19 Lockdown. *International Journal of Environmental Research and Public Health*, 17(16), 5928.
- Bigler Mazlaghani, P., and Gholami-Fasharaki, M. (2019). The mediating role of social support in the relationship between family emotional climate and adolescent social anxiety, *Navid No Medical Quarterly*, 23 (73), 35-46.

- Chawla, N., Sharma, P., & Sagar, R. (2020). Psychological Impact of COVID-19 on Children and Adolescents: Is There a Silver Lining? *The Indian Journal of Pediatrics*, 14(1).
- Casali, N., Feraco, T., Ghisi, M., & Meneghetti, C. (2020). "Andra tutto bene": Associations between character strengths, Psychological Distress and Self-efficacy During Covid-19 lockdown, *Journal of happiness studies*, 293(1), 1-20.
- Dalton, L., Rapa, E., & Stein, A. (2020). Protecting the psychological health of children through effective communication about COVID-19. *The Lancet – Child & Adolescent Health*, 4, 346–347.
- Dalen, V. M., Dierckx, B., Pasmans, S. G. M.A., Aendekerk, E. W. C. Mathijssen, I. M.J.... (2020). Anxiety and depression in adolescents with a visible difference: A systematic review and meta-analysis, *Body Image*, 33, 38-46.
- Hombrados-Mendieta, M. I. Gomez-Jacinto, L., Dominguez-Fuentes, J. M., Garcia-Leiva, P., and Castro-Trave, M. (2012). Types of social support provided by parents, teachers and classmates during adolescence, *Journal of Community Psychology*, 33, 645- 664.
- Jafari, S., Mohtashami, J., Alaei Karroudi, F., Mansouri, M., and Rasouli, M. (2016). Evaluation of perceived social support and its related factors in adolescents with chronic diseases, *Journal of the School of Nursing and Midwifery, Tehran University of Medical Sciences (Hayat)*, 22 (1), 78-65. [Persian].
- Khosrojerdi, Z., Heidari, M., Ghanbari, S., & Pakdaman, SH. (2020). Developing a Mastery Goal Model Based on Character Strengths in Adolescents, *Positive Psychology Research*, 5(4), 65-80. [Persian].
- Meng, Q. M.S., Shuang-Jiang, Z, M.S., Zhao-Chang, G., Li-Gang, Z., Hong-Jie, M., Xiao-Min, L. M.S., and Jing-Xu, C, M.D. (2020), The Effect of Social Support on Mental Health in Chinese Adolescents During the Outbreak of COVID-19, *Journal of Adolescent Health*, 1-5.
- Niemiec, R. M. (2019). Six functions of character strengths for thriving at times of adversity and opportunity: A theoretical perspective. *Applied Research in Quality of Life*. 15, 551-572.
- Niemiec, R. M., & McGrath, R. E. (2019). *The power of character strengths: Appreciate and ignite your positive personality*. VIA Institute on Character.
- Niemiec, R. M. (2013). VIA character strengths: Research and practice (The first 10 years), perspectives on positive psychology, In H. H. Knoop & A. Delle Fave (Eds.), *Well-being and cultures: Perspectives on positive psychology* (pp. 11-30). New York: Springer.
- Nobles, J., Martin, F., Dawson, S., Moran, P. and Savovic, J. (2020) The potential impact of COVID-19 on mental health outcomes and the implications for service solutions. Available from: <https://arc-w.nihr.ac.uk/research-and-implementation/covid-19-response/potential-impact-of-covid-19-on-mental-health-outcomes-and-the-implications-for-service-solutions/>
- Park, N., & Peterson, C. (2008). Positive psychology and character strengths: Application to strengths-based school counseling. *Professional School Counseling*, 12(2), 85-92.
- Peterson, C., & Seligman, M. E. P. (2004). *Character Strengths and Virtues: A Handbook and Classification*. New York: Oxford University Press and Washington, DC: American Psychological Association.
- Procidano, M. E., & Heller, K. (1983). Measures of perceived social support from Friends and from Family: Three Validation Studies, *American Journal of Community Psychology*, 11(1), 1-24.
- Rashid, T., & McGrath, R. E. (2020). Strengths-based actions to enhance wellbeing in the time of COVID19. *International Journal of Wellbeing*, 10(4), 113-132.
- Sanford, A. (2020) Coronavirus: Half of humanity now on lockdown as 90 countries call for confinement. Available at: <https://www.euronews.com/2020/04/02/coronavirus-in-europe-spain-s-death-toll-hits10-000-after-record-950-new-deaths-in-24-hou> (accessed 28 September 2020).
- Shuchman, M. (2020). Low- and middle-income countries face up to COVID-19. *Nature Medicine*. 26 (7), 986-988.
- Wambua, GN. A., Obondo, A., & Kumar, M. (2018). The role of attachment relationship in adolescents' problem behavior development: a cross- sectional study of Kenyan adolescents in Nairobi city, *Child Adolesc Psychiatry Ment Health*, 12 (27).
- Zhang, W., Liu, H., Jiang, X., Wu, D., & Tian, Y. (2014). A Longitudinal Study of Posttraumatic Stress Disorder Symptoms and Its Relationship with Coping Skill and Locus of Control in Adolescents after an Earthquake in China, *Post-Disaster Psychological Health in Adolescents*, 9(2), 1-7.

Efficacy of Dialectical Behavior Therapy in Reduction of Negative Emotions in Obese Women

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Abstract

Objective: Dialectical Behavior Therapy (DBT) was originally developed to treat individuals with pervasive emotion dysregulation. Then it developed its approach in other disorders such as obesity. This research aims to found out the efficacy of DBT in the reduction of negative emotions (anxiety, depression, and anger) with weight loss in obese women with different reasons for obesity.

Method: The population of this quasi-experimental study consisted of 56 obese women with a body mass index more than 29.9 kg/m². Descriptive statistics were computed for demographic information and self-report questionnaire. Anger, anxiety, and depression are three subscales of feelings that were tested by the 25 items of Emotional Eating Scale that was developed by Arnow, Kenardy and Agras in 1994.

Results: The results demonstrated that negative emotions such as anger, anxiety, and depression, significantly ($p\text{-value} < .001$) decrease in obese women by weight loss during the time. Mixed-effect modeling ANOVA repeated measurements were performed to study changes in variables over time.

Conclusions: The results of the present study show that DBT-skills can be effective in decreasing emotion dysregulations and Body Mass Index (BMI).

Keywords: BMI, DBT, Emotion Regulation, Obesity, Weight Loss.

Introduction

Obesity is a global challenge which is defined as the excessive fat accumulation that may impair health (Nemati et al, 2021), such as diabetes, heart disease, and cancers. High demands of individuals seeking obesity treatment make researchers much attention have been directed towards improving treatment outcomes. (Cornes & Martin, 2007). We categorize obesity resources to three different groups:

1- Biological (e.g., energy metabolism (Bouchard, Tchernof, & Tremblay, 2014)) and parents' obesity (Kim, Kim, & Hing, 2016).

2- Behavioral (e.g., the presence of eating pathology, night eating syndrome, physical activity, eating habits (Yahia et al, 2017)).

3- Emotional (e.g., stress (Michels, Sioen, Ruige & De Henauw, 2017)), anxiety, anger (Schneider et al., 2010) depressed, bored or happy (Braden, Musher-Eizenman, Watford & Emley, 2018).

Studies on the etiology and causes of obesity began more than 50 years ago (Bray, Barry & Mothon, 1970). Early results found may reflect genetics and environmental influences (Cornes, Zhu & Martin, 2007) but over the past decade, increasing attention has been paid to emotion

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regulation as a potentially unifying function of diverse symptom presentations (Quoidbach, Mikolajczak & Gross, 2015) and efforts to control, suppress, or avoid unwanted internal experiences (including emotions) may actually have paradoxical effects. (Gratz & Tull, 2010)

Emotion regulation can be defined as the ability to regulate emotions and emotional responses (Gross, 1998). Hence, deficits of emotion regulation can be found in a large number of psychiatric disorders (Repetti, Taylor & Seeman, 2002) without attention to the resources of obesity such as eating disorders (Bodell et al, 2019) including binge eating (Svaldi et al, 2019) and the hallmark of emotional eating, and bulimia nervosa (Ouwens, Van Strien, Van Leeuwe & Van der Staak, 2008).

Many researchers have mainly focused on the role of negative emotions as a trigger for food consumptions, but Emotional Eating refers to the tendency to eat in response to not only negative emotions but also positives as well (Wong, 2020). Moreover, van Strien et al, (Van Strien, Engels, Van Leeuwe & Snoek, 2005) found that the relationship between negative affect and overeating was mediated by poor interoceptive awareness which is positively correlated with the use of emotional eating (Rommel et al, 2012). Some pilot studies have investigated the effect of DBT skills training on problematic eating behaviors in individuals with obesity, suggesting that skills training may reduce emotional eating (Roosen, Safer, Adler, Cebolla & Van Strien, 2012) and improve mood (de Souza, Cancian, de Castro & da Silva, 2019).

One of the negative emotions is sadness and depressed. Feeling depression is normally associated with loss of appetite and subsequent weight loss (Geiker et al, 2018). Emotional eating may be a marker of atypical depression subtype which increases appetite, elevated risk of obesity (Levitan et al, 2012) and subsequent weight gain

(Lasserre et al, 2014). Also anxiety is a reaction to reversed stress response of the HPA axis (Van Strien, 2018), or a kind of blunted HPA axis activity means blunted cortisol chronic stress (Van Strien, Roelofs & de Weerth, 2013), which may be underlying mechanism of emotion leads to emotional eating and higher food intake. On the other hands, anger is typically conceptualized as an emotional response to a frustrated attempt to achieve an attainable goal, and serves to “drive” further attempts to pursue a goal with increased vigor (Schneider et al, 2010).

The aim of this study was to determine the effect of DBT on weight loss and negative emotions in obese women with various causes of obesity such as biological, behavioral, and emotional sources that have never been worked on before. By doing so, we can better help obese people find a cost-effective way for a variety of obese reasons, both in terms of time and cost.

Method

Participants and Procedure

This research was a quasi-experimental study. Participants were recruited with a body mass index greater than 29.9 kg/m² from Amir al Momenin Hospital and a private clinic in Tehran during May to October 2019. Inclusion criteria were as follows: female, obese, BMI ≥ 29.9 kg/m², age 18 to 65, no breast-feeding and no pregnancy and having a minimum literacy (high school). Other criteria were consent of participating in group therapy and research protocol, no physical disease to use special drugs such as chemotherapy, not using other psychological or pharmaceutical intervention for obesity and willing to participate in the study. Exclusive criteria were any concurrent treatment for weight, medical conditions such as uncontrolled diabetes, thyroid problems that might influence weight or eating, pregnancy, and severe psychiatric conditions as well as

being absence more than three sessions. Given a large effect size ($f = 0.8$), a power of 80%, and an alpha statistic of .05, approximately 12-15 participants were needed in each group. The first screening interviews were conducted by two-member experts in the hospital for weight and height to calculated BMI. Then the second screening was conducted from eligible participants by demographic and self-reported questionnaires. Finally, 56 individuals were chosen and divided into experimental and control groups. Questionnaires repeated right after three months later after finishing intervention as well as follow up during two months later. The intervention which was adapted from The DBT Solution to Emotional Eating (Van Strien, 2018) was performed simultaneously to trial groups. Intervention included 13 group-sessions, of about 90 minutes each, one day per week. Participants were accepted into the 12 sessions of DBT training skills plus one extra session for prevention of relapse. (Table 1.)

The research was carried out under the Helsinki Declaration and approved by the ethical committee

of Hormozgan University of Medical Sciences (code: IR_HUMS.REC.1398.344).

Measurement

Body Mass Index

BMI calculations were based on dividing weight (kg) by standing height squared meters (m^2) by trained interviewers. Weight was measured to the nearest 0.01 kg using a Zelmer electronic digital scale. Calibration of the scale was checked regularly. Height was measured with in bare feet and to the nearest millimeter using a portable stadiometer. Two independent measurements were taken for each participant, and if the measurements differed by 0.2 kg for weight or 0.5 cm for height, a third measurement was taken. The final result were averaged of two measurements of weight and height and used to calculate BMI.

Emotional Eating Scale (EES)

The self-report emotional eating scale has 25 items with three subscales that target feeling in the domains of Anger, Anxiety and Depression. Respondents are asked to rate the experience different type of feelings during eating, using a 5-point Likert scale. The item scores are summed form a total score between 25 and 125.

Table 1-protocol of DBT adapted skills training

Session	Agenda
1 st	The DBT approach to stopping binge eating (The DBT emotion regulation model)
2 nd	Making a commitment to stop binge eating- pros & cons, exploring values
3 rd	The program's goal & steps and tools to get it, diary cards, pre mindfulness skills & diaphragmatic breath
4 th	Become to be your own DBT coach, behavioral chain analysis
5 th	The benefits of DBT thinking and mindfulness, just notice and observation
6 th	Becoming a more skillful observer, nonjudgmental stance, stop being right or perfect
7 th	Staying on track, review
8 th	Mindful eating and urge surfing
9 th	Being mindful of current emotions and radically acceptance emotions
10 th	Reducing vulnerability to emotion mind and building mastery
11 th	Building positive experiences steps for increasing positive emotions
12 th	Distress tolerance & the crisis survival skills
13 th	Reviewing planning for the future, prevent relapse

The EES total score demonstrated good internal consistency ($\alpha = 0.96$ to 0.97) (Delporte et al, 2019) and ($\alpha = 0.81$), moderate test-retest reliability ($r = 0.79$) (Dube, Menon, 2000).

Statistical Analysis

Statistical analysis was performed using the IBM SPSS Statistics software package version 24.0. Research was of quasi-experimental type and was designed psychological approach. Descriptive statistics were computed for demographic information and questionnaire subscales and total scores. Mixed-effect modeling ANOVA was performed to study changes in variables over time (pre-test, post-test and follow-up). The significant level was set as P values $\leq .05$.

Results

The research was conducted with 56 obese patients ranged from 19 to 64 years old. The mean of BMI was 38.23 kg/m^2 ($SD=12.67$), while in Pre-Test mean BMI was 32.08 ($SD=1.54$), Post-Test $M=29.92$ ($SD=1.86$) and follow up $M=29.13$ ($SD=1.31$). Regarding marital status, 25 participants were married (44.64%), followed by those who were singles ($n=22$, 39.28%) and divorced ($n=8$, 14.29%) also 1 participant was widowed (1.79%). Most of the individuals had at least bachelor degree ($n=18$, 32.1%), associated ($n=9$, 16.1%) and diploma ($n=13$, 23.2%). Around 5.4% had less than diploma ($n=3$) and 23.2% had completed master degree ($n=13$). About 46.4% ($n=26$) were employed, 37.5%

($n=21$) were homemakers, and 16.1% ($n=9$) were students. No client dropped out during the course of treatment. The descriptive characteristics are presented in Table 2.

TABLE 2. DEMOGRAPHIC CHARACTERISTICS OF INTERVENTION COMPLETERS (N=56)

	MEAN %
BODY MASS INDEX (BMI)	38.23 (12.67)
AGE	38.52
MARITAL STATUS	
SINGLE	39.28 (N=22)
MARRIED	44.64 (N=25)
DIVORCED	14.29 (N=8)
WIDOWED	1.79 (N=1)
OCCUPATION	
HOUSEWIFE	37.5 (N=21)
OCCUPIED	46.4 (N=26)
STUDENT	16.1 (N=9)
EDUCATION	
UNDER DIPLOMA	5.4 (N=3)
DIPLOMA	23.2 (N=13)
ASSOCIATED DIPLOMA	16.1 (N=9)
BACHELOR	32.1 (N=18)
MASTER	23.2 (N=13)

The means and standard deviations of research variables are presented in table 3.

The pre-assumption was DBT-skills can be effective in decreasing emotion dysregulation and indirectly on weight, emotional eating and BMI. A significant weight loss and decrease in emotional eating and BMI demonstrated right after the end of intervention according to the trajectories of the outcomes over time. Also, results at emotional situations such as anger,

Table 3. Raw data for each outcome, Mean, Standard Deviations/group at pre, post and 2 months follow up

measure M=SD	Pre test				Post test				Follow up			
	Biological	Behavioral	Emotional	Control	Biological	Behavioral	Emotional	Control	Biological	Behavioral	Emotional	Control
BMI	33.13±1.70	32.08±1.51	31.32±1.18	31.80±1.25	30.26±2.04	29.49±1.37	28.691.83±	31.26±1.17	29.542.15±	27.911.62±	27.561.75±	31.511.30±
Anger	19.77±2.56	27.31±2.56	40.15±2.56	34.46±2.56	17.15±1.99	22.77±1.99	25.921.99±	31.541.99±	17.772.23±	19.152.23±	25.382.23±	31.002.23±
Anxiety	14.69±1.79	18.61±1.79	28.85±1.79	25.46±1.79	12.85±1.47	14.69±1.47	18.851.47±	23.081.47±	13.151.54±	13.851.54±	18.921.54±	23.23±1.54
Depression	10.23±1.11	12.08±1.11	17.85±1.11	16.46±1.11	8.64±0.98	9.846±0.98	11.540.98±	14.230.98±	8.771.01±	8.771.01±	10.921.01±	14.921.01±

Note: P -values <0.05 are statistically significant, M Mean, SD Standard Deviation. Anger, Anxiety and Depression are subscales of Emotional Eating Scale (EES)

anxiety and depression, demonstrated significant decrease during the time in comparison control group according to $P \leq .05$ and Cohen's d effect size.

Mixed model ANOVAs (repeated measures) was completed in each emotion in different groups. Results demonstrated statistically significant based on F , partial η^2 and Cohen's d , had large effect size. Great effect size was found in emotional from pre-test to post-test as well as pre-test to follow-up. While small to medium effect size was demonstrated in post-test to follow up. Nonetheless, the data's demonstrated a slight tendency towards returning to post-test values by the two-month follow-up.

Results for the decrease of anger demonstrated statistically significant main effect of groups, $F(3, 48) = 9.437$, $p=0.000$, partial $\eta^2= 0.371$, and did demonstrate a large effect size. Also statistically significant decrease has been demonstrated in anxiety by $F(3, 48) = 10.639$, $p>0.05$, partial $\eta^2= 0.399$ and depression by $F(3, 48) = 8.044$, $p=0.000$, partial $\eta^2= 0.335$.

Moreover, the data seem to be compatible with the hypothesis that the effects of the intervention remain stable or slight tendency towards returning to baseline at 2 months follow-up. The data's are presented in table 4 and 5.

Table 4. Results of covariance analysis in respect to the DBT training on Emotional Eating

	DF	F	Sig	η^2
Anger	3 48	9.437	0.000	0.371
Anxiety	3 48	10.693	0.000	0.399
Depression	3 48	8.044	0.000	0.335

Note: Mean changes and effect sizes presented with positive values indicate of improvement in functioning and negative values indicative of decline in functioning. p -values<0.001.

Discussion

In the present study, our aim was to found out how DBT skills provide in reducing emotions such as depression, anxiety, and anger lead to

overeating, as well as weight loss and BMI in obese women with different causes. This study found reduced emotions dysregulation in obese patients compared to control group after DBT-adapted skill training and reduced weight and emotions such as depression, anxiety, and feeling guilty or loneliness.

The results of the present study indicate improvements in patterns of emotional eating, along with decreased problematic eating, after intervention. These improvements were sustained with slight or none tendency at follow-up. Also the results of the analysis were compatible with the hypothesis that DBT benefits in reduction of negative emotions with weight loss in obese women. Because DBT is an intervention that in addition to developing mindfulness skills, also promotes the acquisition of more effective emotion-regulation strategies (Neacsiu et al, 2014). Hence, it has been suggested that emotion regulation is a mechanism of change in acceptance-and-mindfulness-based therapies, a class of therapies to which DBT belongs (Gratz & Tull, 2010). Song and Lindquist (2015) demonstrated mindfulness effectively reduced hopelessness, depression, anxiety and stress (Lothes, Mochrie & St John, 2014).

Our findings were consistent with other studies that investigated the effects of DBT on this due. For instance, Chen et.al. (Chen et al, 2008), used DBT for clients with binge eating disorder or bulimia nervosa and found from pre to 6-months follow-up, effect sizes for binge eating were large for all outcomes. Also, Safer and Jo (2010) found that DBT reduced eating disorder symptoms, anger, anxiety and depression at one year follow-up. Moreover, Kamody, Thurston, and Burton (2020) who trained adolescence with acceptance-based on DBT skills, found increases in distress tolerance appraisal and emotion regulation scale scores from baseline to post-intervention.

Table 5. Effect size (d) and mean of outcomes

outcome	Group	Pre test-post test		Pre test-Follow up		Post test-Follow up	
		MD	Cohen's d	MD	Cohen's d	MD	Cohen's d
	Biological						
Anger	Behavioral	4.539	1.98	8.154	3.39	3.615	1.71
	Emotional	14.231	6.22	14.769	6.15	0.538	0.25
	Control	2.924	1.28	3.462	1.44	0.538	0.25
	Biological						
Anxiety	Behavioral	3.923	2.46	4.769	2.86	0.846	0.56
	Emotional	10	6.1	9.923	5.95	-0.077	0.05
	Control	2.385	1.46	2.231	1.34	-0.154	0.1
	Biological						
Depression	Behavioral	2.231	2.13	3.308	3.13	1.077	1.08
	Emotional	6.308	6.03	6.923	6.54	0.615	0.62
	Control	2.231	2.13	1.539	1.45	-0.692	1.32

Our findings are also consistent with the study of Kenny, Carter, and Safer (2020) who use DBT for BED offer a potentially effective means of more widely disseminating this treatment such as higher intensity approaches and less time-consuming. Mild weight loss or weight maintenance after DBT has been observed as well as decreased overeating or binge eating after dieting.

The present study relied on self-report questionnaire for all outcomes, thereby limiting the generalizability of the findings. It is true that these questionnaires are able to capture the occurrence and intensity of the behaviors of interest, not 100% actually, they still rely on the participant's responses and his or her ability to fully understand what is being asked, as well as his or her ability to accurately describe his or her own behavior in retrospect, which may be influenced by a multi factors, such as emotional states, literacy, and social desirability concerns. Also high drop-out rates at the beginning of treatment encounter us delay to start the DBT-skill trainings and repeat the questionnaires several times.

The strength of the study was that body height and weight were obtained through by objective

measurements in 100% of the participants and not self report. Since the program developed is brief, there is not any dropped out of the DBT treatment after starting intervention in the last trial. So implementation is likely a cost-effective option for various health care systems and patients. Also to our knowledge, this is the first research in the world to work on causes of obesity that evaluate the efficacy of DBT. The last but not the least, treatment has done by the translator of the book "the DBT solution for emotional eating" who mastered the content and implementation of the intervention. Overall we highly recommend to the future researchers to work on online training of DBT skills as well as in different groups of patients such as diabetes, cancers or even different ages with different emotions.

Conclusions

In conclusion, Dialectical Behavior Therapy was proved to significantly alleviate negative emotion and relief distress from negative thoughts. Also, as an adjunctive treatment, such as obesity bariatric surgery, it is a considerable investment of both time and money for individuals affected by different obesity causes in emotion dysregulations.

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Conflict of interest

The authors declare that there are no conflicts of interest.

References

- Arnow, B., Kenardy, J., & Agras, W. S. (1995). The Emotional Eating Scale: The development of a measure to assess coping with negative affect by eating. *International Journal of Eating Disorders*, 18(1), 79-90.
- Bodell LP, Pearson CM, Smith KE, Cao L, Crosby RD, Peterson CB, Crow SJ, Berg KC. (2019). Longitudinal associations between emotion regulation skills, negative affect, and eating disorder symptoms in a clinical sample of individuals with binge eating. *Eating behaviors*. 32:69-73.
- Bouchard C, Tchernof A & Tremblay A. (2014). Predictors of body composition and body energy changes in response to chronic overfeeding. *International journal of obesity*. 38(2):236-42.
- Braden A, Musher-Eizenman D, Watford T, Emley E. (2018). Eating when depressed, anxious, bored, or happy: Are emotional eating types associated with unique psychological and physical health correlates?. *Appetite*. 125:410-7.
- Bray GA, Barry WS, Mothon S. (1970). Lipogenesis in adipose tissue from genetically obese rats. *Metabolism*. 19(10):839-48.
- Chen EY, Matthews L, Allen C, Kuo JR, Linehan MM. (2008) Dialectical behavior therapy for clients with binge-eating disorder or bulimia nervosa and borderline personality disorder. *International Journal of Eating Disorders*. 41(6):505-12.
- Cornes BK, Zhu G, Martin NG. (2007). Sex differences in genetic variation in weight: a longitudinal study of body mass index in adolescent twins. *Behavior Genetics*. 37(5):648-60.
- Delparte, C. A., Power, H. A., Gelinas, B. L., Oliver, A. M., Hart, R. D., & Wright, K. D. (2019). Examination of the effectiveness of a brief, adapted dialectical behavior therapy-skills training group for bariatric surgical candidates. *Obesity Surgery*, 29(1), 252-261.
- de Souza LA, Cancian AC, de Castro TG, da Silva Oliveira M. (2019). Problematic and adaptive eating in people with obesity after a DBT-based skills training intervention: 3-and 8-month follow-up and mediation analysis. *Psicologia: Reflexão e Crítica*. 32(1):1.
- Dube, L, Menon K. (2000). Multiple roles of consumption emotions in post-purchase satisfaction with extended service transactions. *International Journal of Service Industry Management*. 11(3):287-304.
- Geiker NR, Astrup A, Hjorth MF, Sjödin A, Pijls L, Markus CR. (2018). Does stress influence sleep patterns, food intake, weight gain, abdominal obesity and weight loss interventions and vice versa?. *Obesity Reviews*. 19(1):81-97.
- Gratz KL, Tull MT. (2010) Emotion regulation as a mechanism of change in acceptance-and mindfulness-based treatments. Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change. 107-33.
- Gross JJ. (1998). The emerging field of emotion regulation: An integrative review. *Review of general psychology*. 2(3):271-99.
- Kamody RC, Thurston IB, Burton ET. (2020). Acceptance-based skill acquisition and cognitive reappraisal in a culturally responsive treatment for binge eating in adolescence. *Eating Disorders*. 28(2):184-201.
- Kenny TE, Carter JC, Safer DL. (2020) Dialectical behavior therapy guided self-help for binge-eating disorder. *Eating Disorders*. 28(2):202-11.
- Kim Y, Kim H, Hong YC. (2016). Transmission of energy-saving efficiency from obese parents to their offspring: the Korean National Health and Nutrition Examination Survey 2007–2011. *European Journal of Clinical Nutrition*. 70(4):511-6.
- Lasserre AM, Glaus J, Vandeleur CL, Marques-Vidal P, Vaucher J, Bastardot F, Waeber G, Vollenweider P, Preisig M. (2014). Depression with atypical features and increase in obesity, body mass index, waist circumference, and fat mass: a prospective,

- population-based study. *JAMA psychiatry*. 71(8):880-8.
- Levitan RD, Davis C, Kaplan AS, Arenovich T, Phillips DI, Ravindran AV. (2012). Obesity comorbidity in unipolar major depressive disorder: refining the core phenotype. *The Journal of clinical psychiatry*. 73(8):1119-24.
- Lothes JE, Mochrie KD, St John J. (2014) The effects of a DBT informed partial hospital program on: Depression, anxiety, hopelessness, and degree of suffering. *Journal of Psychology & Psychotherapy*. 4(3):1.
- Michels N, Sioen I, Ruige J, De Henauw S. (2017). Children's psychosocial stress and emotional eating: A role for leptin?. *International Journal of Eating Disorders*. 50(5):471-80.
- Neacsiu AD, Eberle JW, Kramer R, Wiesmann T, Linehan MM. (2014). Dialectical behavior therapy skills for transdiagnostic emotion dysregulation: A pilot randomized controlled trial. *Behaviour research and therapy*. 59:40-51.
- Nemati, S. M., Narimani, M., Ghannadiasl, F., & Sadeghi-Hashjin, G. (2021). Comparison of Training Package (SMN) and Low-Calorie Diet on Psychological Distress and Weight in Overweight People. *Iranian Journal of Health Psychology; Vol, 3(2)*.
- Ouwens MA, Van Strien T, Van Leeuwe JF, Van der Staak CP. (2009). The dual pathway model of overeating. Replication and extension with actual food consumption. *Appetite*. 52(1):234-7.
- Quoidbach J, Mikolajczak M, Gross JJ. (2015). Positive interventions: An emotion regulation perspective. *Psychological bulletin*. 141(3):655.
- Repetti RL, Taylor SE, Seeman TE. (2002). Risky families: family social environments and the mental and physical health of offspring. *Psychological bulletin*. 128(2):330.
- Rommel D, Nandrino JL, Ducro C, Andrieux S, Delecourt F, Antoine P. (2012). Impact of emotional awareness and parental bonding on emotional eating in obese women. *Appetite*. 59(1):21-6.
- Roosen MA, Safer D, Adler S, Cebolla A, Van Strien T. (2012). Group dialectical behavior therapy adapted for obese emotional eaters; a pilot study. *Nutricion hospitalaria*. 27(4):1141-7.
- Safer DL, Jo B. (2010) Outcome from a randomized controlled trial of group therapy for binge eating disorder: Comparing dialectical behavior therapy adapted for binge eating to an active comparison group therapy. *Behavior therapy*. 41(1):106-20.
- Schneider KL, Appelhans BM, Whited MC, Oleski J, Pagoto SL. (2010). Trait anxiety, but not trait anger, predisposes obese individuals to emotional eating. *Appetite*. 55(3):701-6.
- Song Y, Lindquist R. (2015) Effects of mindfulness-based stress reduction on depression, anxiety, stress and mindfulness in Korean nursing students. *Nurse education today*. 35(1):86-90.
- Svaldi J, Werle D, Naumann E, Eichler E, Berking M. (2019). Prospective associations of negative mood and emotion regulation in the occurrence of binge eating in binge eating disorder. *Journal of psychiatric research*. 115:61-8.
- Van Strien T, Engels RC, Van Leeuwe J, Snoek HM. (2005). The Stice model of overeating: tests in clinical and non-clinical samples. *Appetite*. 45(3):205-13.
- Van Strien T. (2018). Causes of emotional eating and matched treatment of obesity. *Current diabetes reports*. 18(6):35.
- Van Strien T, Roelofs K, de Weerth C. (2013). Cortisol reactivity and distress-induced emotional eating. *Psychoneuroendocrinology*. 38(5):677-84.
- Wong L, Stammers L, Churilov L, Price S, Ekinci E, Sumithran P. (2020). Emotional eating in patients attending a specialist obesity treatment service. *Appetite*. 10:104708.
- Yahia N, Brown C, Potter S, Szymanski H, Smith K, Pringle L, Herman C, Uribe M, Fu Z, Chung M, Geliebter A. (2017). Night eating syndrome and its association with weight status, physical activity, eating habits, smoking status, and sleep patterns among college students. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*. 22(3):421-33.