

Effectiveness of Cognitive Behavioral Therapy and Rational Emotive Behavior Therapy in Reducing Social Anxiety among Overweight Adolescents

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Received 2020 April 04; Accepted 2020 November 23.

Abstract

Background and Objective: In recent decades, emphasis on diet and thinness has been considered by all social and racial classes. This study aimed to compare the effectiveness of the cognitive behavioral approach and rational emotive behavior therapy in reducing social anxiety among overweight adolescents.

Materials and Methods: This quasi-experimental research was conducted based on a pretest-posttest control group design and a two-month follow-up. The statistical population of this study consisted of male and female adolescents with overweight and obesity problems referred to clinics in Tehran, Iran, in 2019. Among this population, 60 subjects were selected using the convenience sampling method and were randomly assigned to experimental and one control groups. Interventions in both groups were administered in a form of group therapy and consisted of 8 sessions of 120-minute. The required data were obtained by the Social Phobia Inventory and analyzed in SPSS software (version 22) using the repeated measures ANOVA. The significance level in this study was considered to be 0.05.

Results: The results showed that cognitive behavioral approaches and rational emotive behavior therapy could effectively reduce social anxiety among overweight adolescents ($P < 0.001$). However, no significant difference was observed between the effectiveness of cognitive behavioral and rational emotive behavior therapy on social anxiety.

Conclusion: It can be concluded that the cognitive behavioral approach and rational emotive behavior therapy could have positive effects on reducing social anxiety among adolescents.

Keywords: Anxiety, Emotions, Behavior therapy, Cognition, Overweight

1. Introduction

Obesity is one of the most important public health concerns affecting more than half a billion people in the world and is considered a health problem in both growing and developed countries (1). Obesity is a chronic and progressive disease that is associated with decreased quality of life, decreased life expectancy, weakened psychological performance, social isolation, anxiety, limitation of physical activity, and long-term concerns about physical health (2). On the other hand, in recent decades, the emphasis on diet and thinness has been taken into consideration by all social and racial classes. One of the criteria for beauty, especially among the young and adolescents, is having a balanced weight more easily than balanced (3). Lack of attractive appearance is one of the most obvious barriers to achieving satisfactory relation-

ships with peers. Today, countless people around the world suffer from obesity, which is defined as an excessive density of body fat. There is a lot of speculation about the causes of overweight, and the results of studies show that physiological mechanisms justify only a part of our eating habits (4).

According to the fifth version of the Diagnosis and Statistical Manual of Mental Disorders, social anxiety disorder is fear or severe anxiety from social situations in which the individual is evaluated by others. People with this disorder are afraid of being negatively assessed by others when faced with social situations, while others consider them anxious, weak, ignorant, and boring (5). The positive relationship of obesity with panic disorder (especially in women), specific phobia, and social phobia have been confirmed (6). Among obese people, 29% of

females suffer from social anxiety, and the overall rate of social anxiety is to be higher in obese women than in obese men (7). Adolescent girls with obesity are reported to have higher levels of self-esteem, social anxiety, and depression, compared to their non-obese counterparts (8). Obese people who suffer from over-eating disorder experience higher rates of social anxiety (9) and 59% of patients with obesity and overweight suffer from social anxiety (10).

The cognitive behavioral approach helps the patient to recognize their distorted patterns and inefficient behaviors. To change these distorted thoughts and their dysfunctional behaviors, it is necessary to hold regular discussions and perform precisely organized behavioral tasks. In some aspects of treatment, the emphasis is mainly on behavior and partly on other cognitive aspects (11). The cognitive behavioral approach is used to describe a wide range of techniques to change patterns of thinking and behaviors. This treatment is based on the assumption that weight loss can be caused by changing behavior (e.g., eating or mobility) and cognition (e.g., a person's thoughts about the disease and how to deal with it) (12). To change behavior, environmental antecedents, and consequences that control these behaviors need to be changed.

Rational, emotive therapy is a cognitive approach that emphasizes the role of thought and belief. According to the perspective of Albert Ellis, the founder of this approach, there is a trilateral interaction among one's cognitions, emotions, and behaviors, resulting in an interaction that forms thoughts, actions, and behaviors (13). Intervention based on rational-emotional behavior discovers expectations that lead to emotional and communicational disorder, and then empirically or realistically questions these destructive beliefs and expectations (14). In Ellis's theory, it is believed that the root of problems in internal disorders is different in each couple. In other words, in a troubled marriage, one or both parties follow their own beliefs (15).

Wilhelm et al., in research, titled "Efficacy and posttreatment effects of therapist-delivered cognitive behavioral therapy vs. supportive psychotherapy for adults with body dysmorphic disorder", showed that cognitive behavioral therapy had a more significant effect than supportive psychotherapy and improved body image in people with deformity (16). In a comprehensive study with more than 16,000 adolescent volunteers, AL-Khudairy et al. implemented diet interventions, physical activity, and behavioral therapy on adolescents aged 12-17 years suffering from overweight and obesity. The results of the mentioned research showed little effectiveness in multiple interventions, including a combination of diet, physical

activity, and behavior in reducing body mass index. It was also revealed that these interventions showed a moderate effect on weight loss in obese and overweight adolescents, compared to the control group who received no intervention (17).

The necessity of this study is that the increasing prevalence of overweight and obesity has affected the industrialized countries. It has also made many low and middle-income countries face the double burden of diseases. While these countries are still plagued by infectious diseases and malnutrition, the prevalence of risk factors for non-communicable diseases, such as for overweight and obesity, is increasing, especially in urban populations of such countries. The growing trend of obesity among children and youth is also a special concern for the health of society. Nowadays, highly different programs have been presented for the treatment of obesity and overweight, which in most of them, the emphasis has been on the reduction of energy consumption and physical mobility. In addition, interventions have not been effective. Accordingly, it was necessary to implement a suitable and effective treatment program in this research, which was based on the cognitive behavioral approach and rational emotive behavior therapy. Therefore, the rational emotive behavior therapy approach was also selected to compare the effectiveness of these two approaches in reducing social anxiety among overweight adolescents. This study aimed to compare the effectiveness of the cognitive behavioral approach and rational emotive behavior therapy in reducing social anxiety among overweight adolescents.

Material and Methods

The semi-experimental research was conducted based on a pretest-posttest control group design and follow-up. The statistical population of this study consisted of all male and female adolescents with overweight and obesity problems referred to clinics in Tehran, Iran, in 2019. Among this population, 80 individuals were selected using the purposive sampling method and completed the Social Phobia Inventory. Afterward, 60 cases with high cut-off values were selected as the samples. The required sample size was 0.40%, 0.95%, 0.80%, and 10% for each group, respectively. The subjects were then randomly assigned to two experimental and one control groups. The first group received the cognitive behavioral intervention. The second group was subjected to no intervention under the intervention of rational emotive behavior therapy and the control group received no intervention. The interventions in both groups were administered in a form of group therapy for 8 sessions of 120-minute, 3 sessions of which held online in the zoom program due to the coronavirus. After

2 months of follow-up through questionnaires and re-evaluation, the effectiveness of the interventions and their continuation were investigated on the eligible samples with a moderate socioeconomic situation, no medication, no specific physical illness, the age range of 14-18 years. The exclusion criteria were not participating in educational interventions in more than one session, and not doing homework. Regarding the ethical considerations, the research objectives and procedures were explained to all cases in written form, and they were informed of the possibility of study withdrawal at any research stage. Moreover, all participants were assured of anonymity and confidentiality in this study.

Social Phobia Inventory: This 17-item self-assessment scale, developed by Connor et al. (2000), measures social phobia or social anxiety disorder (18) and consists of 3 sub-scales of fear (6 items), avoidance (7 items), and physiological discomfort (4 items). The items are rated on a 5-point Likert scale (0=not at all to 4=extremely). Connor et al. calculated the reliability of this instrument using test-retest and obtained a correlation of 0.78 to 0.89. They also confirmed the internal consistency of this tool in the normal group with Cronbach alpha coefficient with 0.94, 0.89, 0.91, and 0.8 respectively for the whole scale and fear, avoidance, and physiological discomfort sub-scales. This questionnaire with the cut-off point of 19 and the efficiency and accuracy of the diagnosis of 0.79, distinguishes between individuals with and without a social anxiety disorder. Obtaining a higher score indicates more social anxiety (18). Ebrahimnejad et al. estimated the Cronbach alpha coefficient of the subscales of this questionnaire at a range of 0.74-0.75 (19).

In descriptive statistics, central and dispersion indices, such as mean and standard deviation, were used. Inferential statistics section: Repeated measure ANOVA was used. To investigate the assumptions of the inferential test, Leven's test (to investigate the homogeneity of variances), Kolmogorov-Smirnov test (for normal distribution of data), Mbox test and Mauchly's test of Sphericity were used. The above statistical analysis was performed in SPSS software (version 22). The significance level of the tests was 0.05.

Results

Based on the demographic data, 26 (43.3%) and 34 (56.7%) of the participants were adolescent girls and boys, respectively. The mean scores of age in the cognitive behavioral therapy, rational emotive behavior therapy, and control groups were obtained at 17.1 ± 3.2 , 17.5 ± 3.6 , and 17.7 ± 3.8 years, respectively.

The results of Mbox, Croydon, and Levene's tests were evaluated for observing the assumptions before using the repeated measure ANOVA. Since the results of the Mbox test was not significant for any of the variables, the homogeneity of variance-covariance matrices was not rejected. Furthermore, no significant difference of any of the variables in Levene's test showed that the condition of inter-group variance parity was observed, and the variance of dependent variable error was equal in all groups. Finally, the results of Mauchly's test of Sphericity indicated that this test was also significant for the research variables, and therefore, the assumption of variance parity within the subjects (assumption of sphericity) was not observed ($P > 0.05$). Consequently, Greenhouse-Geisser test was used to investigate the results of the univariate test for intra-group effects and interactions. Moreover, Wilks' lambda test, with a value of 0.11 ($P > 0.05$), showed a significant difference between the scores of the effectiveness of cognitive behavioral therapy and rational emotive therapy on improving social anxiety among the experimental and control groups.

The results of Table 3 showed that the ANOVA scores of anxiety variable for time effect ($P < 0.001$) and group effect ($P < 0.001$) were significant, and the size of a group intervention for social anxiety was obtained at 0.23. Bonferroni posture test was used to compare the paired time, the results of which are presented in Table 4.

The results of tables 4 and 5 showed that the scores of social anxiety variables in the cognitive behavioral therapy and rational emotive behavior therapy groups and in the posttest stage were lower than the pretest ($P < 0.001$). The results showed that social anxiety in the follow-up stage was significantly different from the pretest stage ($P < 0.001$).

Table 2. Mean of social anxiety scores in experimental and control groups

Variable	Group	Pretest		Posttest		Follow-up	
		M	SD	M	SD	M	SD
Social anxiety	CBT	26.55	1.57	22.60	1.75	22.70	1.52
	REBT	28.20	1.57	22.30	1.71	22.70	1.92
	Control	26.10	2.04	26.35	2.47	26.20	2.37

CBT: cognitive behavioral therapy, **REBT:** rational emotive behavior therapy

Table 3. Analysis of variance with repeated measures to investigate the effect of time and group on social anxiety

Variable	Effect	Source	F	P	Eta
Social anxiety	Within subject	Time	459.73	0.001	0.89
		Time×Group	141.40	0.001	0.83
	Between subject	Group	8.51	0.001	0.23

Table 4. Results of Bonferroni follow-up test analysis of repeated follow-up variance on social anxiety variable with cognitive behavioral therapy

Steps		Mean Difference	Standard Error	P
Pretest	Posttest	4.37	0.90	0.001
	Follow-up	4.43	0.54	0.001
Posttest	Follow-up	0.04	0.54	1.00

Table 5. Results of Bonferroni follow-up test analysis of repeated follow-up variance on social anxiety variable with rational emotive behavior therapy

Steps		Mean Difference	Standard Error	P
Pretest	Posttest	4.67	0.66	0.001
	Follow-up	4.98	0.38	0.001
Posttest	Follow-up	0.07	0.58	1.00

Discussion

This study was conducted to compare the effectiveness of cognitive behavioral approaches and rational emotive behavior therapy in reducing social anxiety among overweight adolescents. Regarding the results of the hypotheses, it can be stated that the cognitive behavioral approach was effective in decreasing social anxiety among overweight adolescents. The results of this study were in line with those of studies performed by Wilhelm et al. (16) and Al-Khudairy et al. (17). The reason for the effectiveness of this method can be attributed to the fact that one of the basic hypotheses of the cognitive behavioral approach in the field of anxiety is that anxiety is called by predicting the occurrence of a negative or harmful event or threat perception. Individuals' perception of threats is explained by their mental judgments from the prediction of a negative event and the consequences of that event.

Physical appearance is one of the sources that can affect social anxiety (7). Participants also showed a significant improvement in psychosocial adjustments, such as decreased social anxiety and depression and increased social self-esteem. Furthermore, the results showed that cognitive behavioral image therapy training was effective in reducing social phobia. Based on the findings of the present study, the mean scores of social anxiety were higher among the subjects in the cognitive behavioral therapy group

than among those without this treatment. Cognitive behavioral therapy is also useful in the treatment of social phobia (9). According to this approach, treatment strategies emphasize changing anxious thoughts, attitudes, and perceptions and replacing them with logical ones. The underlying assumption of this method is that the term "unnatural cognitions" leads to changes in anxiety behaviors (6). It can also be noted that the aim of cognitive behavioral therapy regarding social anxiety disorder is to identify patterns of thought and maladaptive behaviors (8). This identification is taught to people with social anxiety disorder through the stimuli that they are feared of, such as going to parties and talking to people, re-assessing cognitive error through cognitive restructuring, and participating in actions. The adoption of the cognitive exposure and restructuring approach introduces a new technique on how to observe situations they fear (12), communicate with others, and overcome their anxiety (11). Moreover, group therapy gives people with social anxiety disorder an opportunity to expose themselves to social situations, role-play, get feedback from others about their social interactions, meet other people who suffer from the same conditions, and better learn the ways to deal with these anxieties.

Regarding the effectiveness of the rational emotive behavior therapy approach in reducing social anxiety among overweight adolescents, it can be

said that overweight adolescents have high levels of social anxiety. Overweight adolescents require psychological interventions, including encouragement to express feelings and communicate with them. The interventions of rational emotive behavior therapy adopt approaches that consist of having mental experiences of positive emotions among overweight adolescents and using solutions to deal with negative emotions to cope with problems, which in turn, increase self-esteem and then reduce social anxiety (14). The rational emotive behavior therapy approach plays an important role in different aspects of life, such as adaptation to life changes and stressful events. Excitement can be considered as biological reactions to situations that we consider important or challenging opportunities, and these biological reactions are accompanied by the response we give to those environmental events. Therefore, the interventions of rational emotive behavior therapy reduce social anxiety, and consequently, increase the mental health of overweight adolescents, resulting in experiencing less discomfort and stress and better dealing with those anxiety-making events (15). The interventions in this therapy as adaptive coping strategies have a positive relationship with mental well-being and physical health, while they have a negative relationship with emotional disorders, such as social anxiety. In other words, in stressful situations, such as anxiety, accepting the problem and thinking about how to overcome the stressful event are associated with a reduction in anxiety caused by the stressful event (14). Consequently, thoughts related to the minor importance of negative events, emphasis on the relativity of events compared to other accidents, and acceptance of the situation and coping with a terrible problem are related to better performance and reduction of symptoms of mental disorders (13).

The present study, similar to any other research, had some limitations that their expression can stipulate the findings and suggestions of the research and help the next researchers to take effective measures to deal with the threat of internal and external validity of research projects. The main limitation of this study was related to the population of the study, which was limited to male and female adolescents in Tehran; consequently, the generalization of the results to other regions and cities should be performed with caution. It is suggested that this study be conducted in another sample group and other cities and the obtained results be evaluated and compared with those of the present study. It is also recommended that this study be followed up after group training in the form of individual counseling. Furthermore, the Ministry of Health, State Welfare Organization, hospitals, and Psychology and Counseling Organization

facilitate the familiarity of psychologists, physicians, and nurses with the concepts of cognitive behavioral approach and rational emotive behavior therapy by holding workshops on these two therapies.

Conclusion

Based on the findings of this study, cognitive behavioral approach and rational emotive behavior therapy could have positive effects on reducing adolescents' social anxiety. However, no significant difference was observed between the effectiveness of cognitive behavioral and rational emotive behavior therapy on social anxiety.

References

1. Mannan M, Mamun A, Doi S, Clavarino A. Prospective associations between depression and obesity for adolescent males and females-a systematic review and meta-analysis of longitudinal studies. *PloS one*. 2016;11(6):157-168. <https://doi.org/10.1371/journal.pone.0157240>
2. Elizondo-Montemayor L, Hernández-Escobar C, Lara-Torre E, Nieblas B, Gómez-Carmona M. Gynecologic and obstetric consequences of obesity in adolescent girls. *Journal of pediatric and adolescent gynecology*. 2017;30(2):156-68. <https://doi.org/10.1016/j.jpag.2016.02.007>
3. Prasad RV, Bazroy J, Singh Z. Prevalence of overweight and obesity among adolescent students in Pondicherry, South India. *International Journal of Nutrition, Pharmacology, Neurological Diseases*. 2016;6(2):72-98. <https://doi.org/10.4103/2231-0738.179966>
4. Shukla NK, Shukla M, Agarwal D, Shukla R, Sidhu HP. Prevalence of overweight and obesity among adolescents in India: a systematic review. *Int J Cur Res Rev*. 2016;8(18):21-41.
5. Soares FC, Barros MV, Bezerra J, Santos SJ, Machado L, & et.al. The synergic relationship of social anxiety, depressive symptoms and waist circumference in adolescents: Mediation analysis. *Journal of affective disorders*. 2019;2(45):241-255. <https://doi.org/10.1016/j.jad.2018.10.366>
6. Spettigue W, Obeid N, Santos A, Norris M, Hamati R, & et.al. Binge eating and social anxiety in treatment-seeking adolescents with eating disorders or severe obesity. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*. 2020;25(3):787-793. <https://doi.org/10.1007/s40519-019-00689-6>
7. Jaremka LM, Pacanowski CR. Social anxiety symptoms moderate the link between obesity and metabolic function. *Psychoneuroendocrinology*. 2019; 1 (10):104-125. <https://doi.org/10.1016/j.psychen.2019.104425>
8. Dalrymple KL, Clark H, Chelminski I, Zimmerman M. The interaction between mindfulness, emotion regulation, and social anxiety and its association with emo-

- tional eating in bariatric surgery candidates. *Mindfulness*. 2018;9(6):1780-1793. <https://doi.org/10.1007/s12671-018-0921-4>
9. Ozkan EA, Gul AI, Ozdemir ZT, Husrevsahi H, Yildirim Z, & et.al. Evaluation of depression and social anxiety symptoms in obese children. *Dusunen Adam The Journal of Psychiatry and Neurological Sciences*. 2016;29(1):8-32. <https://doi.org/10.5350/DA-JPN2016290101>
 10. Abdollahi A, Abu Talib M, Reza Vakili Mobarakeh M, Momtaz V, Kavian Mobarake R. Body-esteem mediates the relationship between self-esteem and social anxiety: The moderating roles of weight and gender. *Child Care in Practice*. 2016;22(3):296-308. <https://doi.org/10.1080/13575279.2015.1054787>
 11. Pourmousa H, Mohammadifar MA, Pesand ST, Rezaei AM. The effectiveness of intimacy training with cognitive-behavioral approach on couples' life quality and happiness. *Electronic Journal of General Medicine*. 2018;15(6): 38-52. <https://doi.org/10.29333/ejgm/93461>
 12. Rodríguez JE, Marzo JC, Piqueras JA. Efficacy of Sphincter Control Training (SCT) in the treatment of premature ejaculation, a new cognitive behavioral approach: A parallel-group randomized, controlled trial. *PloS one*. 2019;14(2): 212-244. <https://doi.org/10.1371/journal.pone.0212274>
 13. Turner MJ. Rational emotive behavior therapy (REBT), irrational and rational beliefs, and the mental health of athletes. *Frontiers in psychology*. 2016; 7 (2):14-23. <https://doi.org/10.3389/fpsyg.2016.01423>
 14. Wood AG, Barker JB, Turner MJ. Developing performance using rational emotive behavior therapy (REBT): A case study with an elite archer. *The Sport Psychologist*. 2017;31(1):78-87. <https://doi.org/10.1123/tsp.2015-0083>
 15. Ogbuanya TC, Eseadi C, Orji CT, Anyanwu JI, Ede MO, & ET.AL. Effect of rational emotive behavior therapy on negative career thoughts of students in technical colleges in Nigeria. *Psychological reports*. 2018;121(2):356-74. <https://doi.org/10.1177/0033294117724449>
 16. Wilhelm S, Phillips KA, Greenberg JL, O'Keefe SM, Hoepfner SS, & et.al. Efficacy and posttreatment effects of therapist-delivered cognitive behavioral therapy vs supportive psychotherapy for adults with body dysmorphic disorder: a randomized clinical trial. *JAMA psychiatry*. 2019;76(4):363-373. <https://doi.org/10.1001/jamapsychiatry.2018.4156>
 17. Al-Khudairy L, Loveman E, Colquitt JL, Mead E, Johnson RE, & et.al. Diet, physical activity and behavioural interventions for the treatment of overweight or obese adolescents aged 12 to 17 years. *Cochrane database of systematic reviews*. 2017; 4 (6): 123-138. <https://doi.org/10.1002/14651858.CD012691>
 18. Connor KM, Davidson JR, Churchill LE, Sherwood A, Weisler RH, Foa E. Psychometric properties of the Social Phobia Inventory (SPIN): New self-rating scale. *The British Journal of Psychiatry*. 2000;176(4):379-86. <https://doi.org/10.1192/bjp.176.4.379>
 19. Ebrahiminejad S, Poursharifi H, Roodsari AB, Zerinodini Z, Noorbakhsh S. The effectiveness of mindfulness-based cognitive therapy on Iranian female adolescents suffering from social anxiety. *Iranian Red Crescent Medical Journal*. 2016;18(11):132-148. <https://doi.org/10.5812/ircmj.25116>
 20. Stewart RE, Chambless DL. Cognitive-behavioral therapy for adult anxiety disorders in clinical practice: A meta-analysis of effectiveness studies. *Journal of consulting and clinical psychology*. 2009;77(4):595-615. <https://doi.org/10.1037/a0016032>
 21. Ellis A. Rational emotive behavior therapy. *Current psychotherapies*. 1995;5(6):162-196.