

## Comparison of the Effectiveness of Cognitive Therapy and Lifestyle Modification Based on LEARN model on Body Mass Index and Psychological Well-being among Obese Women

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(Received: 11 Feb 2020; Revised: 26 Feb 2020; Accepted: 16 Mar 2020)

### Abstract

**Introduction:** This study aimed to compare the effect of cognitive therapy and lifestyle modification based on LEARN model on weight loss and quality of life and well-being associated with obesity.

**Method:** The study was a quasi-experimental study with pre-test and post-test and a control group. The statistical population included all women in Tehran with the age range of 21-43 years, and a body mass index higher than 25. For this purpose, 45 women volunteers were selected based on inclusion criteria and randomly assigned to three groups. Both interventions were held in twelve 90-minute weekly sessions. Subjects in three groups answered the Obesity-Related Well-Being questionnaire before and end of the third and seventh months and their body mass index was also calculated. The collected data were analyzed using SPSS software and repeated measures analysis of variance test.

**Results:** Both cognitive therapy and lifestyle modification based on LEARN model improved body mass index and obesity-related well-being ( $P < 0.05$ ). There was no significant difference between the two interventions in modifying the research variables ( $P > 0.05$ ).

**Conclusion:** Cognitive therapy and lifestyle modification based on LEARN model improved reduced body weight by correcting destructive beliefs and unhealthy behaviors of overweight and obese women.

**Declaration of Interest:** None

**Keywords:** Cognitive therapy, LEARN model, Lifestyle, Overweight, Weight Loss, Well-being.

## **Introduction**

**O**besity is a complex, multifactorial, and largely preventable disease, affecting, along with overweight, over a third of the world's population today (1). The increasing rate of overweight and obesity is a major public health issue in the world (2). Obesity greatly increases the risk of chronic disease morbidity—namely disability, depression, type 2 diabetes, cardiovascular disease, certain cancers—and mortality (3). The negative psychosocial impact of overweight/obesity is also widely recognized (4). Psychological consequences of being overweight or obese can include low self-esteem, anxiety, and more serious disorders such as, depression, eating disorders (5). Thus, the decline in quality of life is one of the important psychological consequences of obesity (6). Quality of life is a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life (7). Quality of life is expressed in both work and leisure behavioral patterns and (on an individual basis) in activities, attitudes, interests, opinions, values, and allocation of income (8). Lifestyle is a composite of motivations, needs, and wants and is influenced by factors such as culture, family, reference groups, and health (7). Because obesity and overweight are major health concerns, it is believed that various aspects of quality of life, including vitality, physical pain, and even social functioning, are affected (9). Numerous studies have emphasized the effect of obesity and overweight on reduced quality of life and health-related well-being (10). For example, Song et al. (11) found that obesity-related quality of life was

lower in women than in men and that overweight women reported less health-related quality of life than other women. A study by Taylor et al. (12) also showed that obesity-motivated behaviors impair health-related quality of life, vitality, activity, and mood.

Therefore, obese people have poorer performance and well-being compared to people with normal weight (13), which is more related to physical dimensions than psychological (14). Epidemiological studies have also shown that overweight and obese people have lower physical and emotional well-being than people with normal weight (15). In this regard, several studies have emphasized the effect of weight control interventions on the quality of life of obese people and their well-being (16). Therefore, improving the quality of life after weight management interventions in overweight and obese people should be considered as one of the therapeutic goals (17). So far, various programs have been designed to treat obesity and weight gain and prevent the complications of obesity, and in most of these treatment programs, the emphasis is on reducing energy intake and increasing physical activity (18).

However, many researchers believe that the therapeutic effects of many existing interventions are reduced because the findings of follow-up studies indicate a high rate of weight relapse in the subjects (19, 20). According to many studies, most weight-loss interventions fail over time and a vicious cycle of weight loss and weight gain is repeated (19). Due to the impact of obesity on biological components, obesity and overweight are problems associated with undesirable eating behaviors (2) that the process of these phenomena is itself influenced by psychological factors (3). Psychological

factors such as beliefs, personality health behaviors, and coping mechanisms play a role in overweight and obesity (21). Also, the disappointing results of traditional obesity treatments have persuaded some experts to focus more on positive psychological changes using psychological interventions rather than focusing solely on weight loss (22). It is believed that the use of psychological interventions facilitates weight loss in the long run by reducing the psychological problems associated with obesity (22).

Studies have also found that the use of such cognitive therapy methods in the treatment of overweight and obesity, compared to radical weight-loss strategies, enables better therapeutic response and the maintenance of weight loss (23). An important justification for using psychological interventions is related to their effectiveness in weight management, their permanent and recognized impact, their ability to prevent weight return, and thus the continuation of their therapeutic effects (24). In general, psychological interventions have been shown to play an important role in reducing the risk of recurrence of chronic disorders (23). In recent decades, various treatment packages have been designed and presented that address the issue of overweight, obesity, as well as abnormal eating behaviors in different ways (24). These include weight loss programs based on a balanced calorie-restricted diet (LEARN) (25) and cognitive therapy based on Beck Diet Solution (24). The beneficial effects of psychological therapies have been proven in several weight disorders, including eating disorders (24). However, in overweight people, the reliable effects of these therapies have been less studied. Therefore,

this study aims to examine and compare the effect of cognitive therapy and lifestyle modification based on LEARN model on weight loss and quality of life and well-being associated with obesity in overweight and obese women.

### Method

The present study is a quasi-experimental research with pre-test and post-test design. The statistical population of the present study consists of all women living in Tehran with an age range of 21-43 years, whose body mass index were higher than 25; that is, they were in the group of obese and overweight people.. After an exclusive interview of 51 overweight and obese volunteers; A total of 32 volunteers were selected based on inclusion-exclusion criteria and were randomly assigned to two groups of cognitive therapy and lifestyle modification based on LEARN model (16 people in each group). Inclusion criteria included, ages between 18-45, being female, body mass index higher than 25, not menopause or pregnant, and written consent to participate in the study. Exclusion criteria included acute mental disorders, acute physical illnesses such as autoimmune disease, heart disease, cancer and diabetes, hypothyroidism, hypertension, debilitating diseases, taking drugs that affect the body's metabolism or body weight.

After the initial evaluation, all participants answered the items of Obesity-Related Well-Being questionnaire and body mass index before and end of the third and seventh months of the intervention. Weight, height, and fat profile of the subjects were measured before and end of the third and seventh months of the

intervention. Then, the individuals of each group underwent the intervention.

In the lifestyle modification-training program designed by Brownell (26), the modification includes exercise, change of attitude, modification of social relationships, and diet. The program is presented in 12 sessions, which are held weekly for 90 minutes. This program includes skills such as self-monitoring of eating, controlling stimuli and hidden calorie intake, shaping healthy eating behaviors, nutrition education, calorie counting, model review ABC Behavior (Antecedent-Behavior-Consequence), and correcting dysfunctional self-talk is to prevent slipping, recurrence, and collapse before and at the end of the third and seventh months. Cognitive therapy based on Beck Diet Solution (24) is a 12-session program of 90 minutes per week. Outlines of the program include familiarity with the logic of treatment, familiarity with and challenge destructive thoughts, familiarity with the ABC (Activating event, Belief, and Consequences) pattern, setting a goal to start a diet, and review dysfunctional thoughts related to dieting, responding to dysfunctional thoughts, overcoming remaining challenges and dysfunctional thoughts are setting up and developing new skills to stop weight loss and start maintaining new weight and evaluating and summarizing. Also, physical activity was prescribed for both groups in the form of walking at a moderate speed for 30 minutes per day. Also, the number of calories received for

the subjects of both groups, according to the level of basal body metabolism calculated by using the Information and Communications Technology or ICT program software, with a reduction of 800 calories from total food intake, and according to the six main groups of the food pyramid, prescribed by a nutritionist. Data collection was done by using the following tools:

- **Obesity-Related Well-Being questionnaire (ORWELL-97):** This questionnaire has 18 items that are scored on a Likert scale from 0-3 (27). This tool has two subscales related to the occurrence (ORWELL97-O) and signs (ORWELL97-R). The designers of this questionnaire reported the reliability of test-retest equal to 92% and Cronbach's alpha equal to 83% for a total score of ORWELL-97 (27).
- The BMI of the subjects was measured using an Omron digital body measuring device, made in Japan, with an accuracy of 0.1 in the fasting state and after defecation.

### Results

The average age of the subjects is 27 years (with a standard deviation of 5.11) with a range of 20-43 years. The average height of the subjects was 160.09 with a range of 146-186 cm. The weight of the subjects ranged from 60 to 99.4 kg (with an average of 75.06 kg). In Table 1, descriptive indicators of subjects' scores in pre-test and post-test are presented. According to table 1, the mean scores of weight, TG, LDL, and TC in the post-test and follow-up decreased in both groups, but HDL and FBS increased.

**Table1:** Descriptive indicators of weight and blood lipid profile

Variable	Cognitive Therapy Group						Lifestyle Modification Group					
	Pre-test		Post-test		Follow-up		Pre-test		Post-test		Follow-up	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
<b>Weight</b>	72.26	6.04	67.05	5.73	66.80	5.03	77.87	11.50	72.51	14.21	72.13	14.46
<b>TG</b>	116.44	29.11	110.52	30.29	90.56	18.43	113.19	21.27	80.43	11.26	103.06	24.05

<b>LDL</b>	47.87	4.55	45.12	3.34	46.25	8.42	61.81	5.67	49.06	4.84	48.06	6.62
<b>HDL</b>	86.87	19.96	107.62	16.12	100.31	22.15	86.62	11.41	102.88	13.23	101.75	27.81
<b>TC</b>	138.38	16.16	157.06	27.28	164.75	23.59	171.25	15.08	166.52	18.91	161.78	23.59
<b>FBS</b>	76.12	3.38	85.93	4.52	86.37	5.27	73.62	5.03	80.56	5.12	25.88	6.74

In Table 2, the results of repeated measures analysis of variance in the lifestyle modification group show a significant difference between the subjects' scores from pre-test to post-test and follow-up in variables of weight, TG,

LDL, HDL, and FBS. Also, the results of this test in the cognitive group to compare the three conditions of pre-test, post-test, and follow-up indicate the significant difference in all variables except LDL.

**Table2.** Results of repeated measures analysis of variance test by the experimental group

Source		df1	df2	MS	F	P	$\eta^2$
<b>Weight</b>	Lifestyle Modification	2	30	165.21	7.75	0.002	0.341
	Cognitive Therapy Group	2	30	152.00	35.05	0.000	0.77
<b>TG</b>	Lifestyle Modification	2	30	4498.58	13.63	0.000	0.47
	Cognitive Therapy Group	2	30	2939.39	5.01	0.013	0.25
<b>LDL</b>	Lifestyle Modification	2	30	904.33	36.75	0.000	0.70
	Cognitive Therapy Group	2	30	30.58	1.10	0.340	0.06
<b>HDL</b>	Lifestyle Modification	2	30	1317.58	6.66	0.004	0.30
	Cognitive Therapy Group	2	30	1772.27	5.16	0.010	0.25
<b>TC</b>	Lifestyle Modification	2	30	148.77	0.81	0.450	0.05
	Cognitive Therapy Group	2	30	2938.89	8.81	0.000	0.37
<b>FBS</b>	Lifestyle Modification	2	30	856.31	26.96	0.000	0.64
	Cognitive Therapy Group	2	30	537.43	31.13	0.000	0.67

Comparison of statistical results of two groups of lifestyle modification groups and cognitive group using repeated measures analysis of variance (Table 3) shows that

there is no significant difference in the pre-test and post-test scores of the two groups in any variables except LDL.

**Table3:** Results of repeated measures analysis of variance for weight, TG, TC, LDL, HDL, and FBS

	df1	df2	MS	F	P	$\eta^2$
<b>Weight</b>	1	31	716.68	2.44	0.129	0.07
<b>TG</b>	1	31	1155.09	1.61	0.214	0.05
<b>LDL</b>	1	31	1033.59	21.63	0.000	0.41
<b>HDL</b>	1	31	33.84	0.05	0.810	0.00
<b>TC</b>	1	31	60.16	0.06	0.804	0.00
<b>FBS</b>	1	31	96.00	3.26	0.081	0.09

### Discussion and Conclusion

This study showed that both lifestyle modification-based therapy and cognitive therapy were effective in reducing BMI and improving the quality of life and well-being related to obesity. This finding is in line with the results of the meta-analytical study of Dietz et al. (20) which showed lifestyle interventions are effective in weight loss and improved eating habits and the effect of short-term treatment continues for months after the end of treatment. Zhang et al. (28) in their study of the effects of lifestyle modification intervention showed that lifestyle changes through exercise reduce weight and improve the fat profile, which is consistent with the results of this study. In a study, Grilo et al. (29) confirmed the long-term effects of cognitive therapy on weight loss in obese people, which is in line with the results of the present study.

However, it should be noted that the difference between the effects of lifestyle modification intervention and cognitive therapy on these variables is not significant. Accordingly, both cognitive intervention and lifestyle modification had the same effect on reducing BMI and improving the quality of life and well-being related to obesity. It can be said that the passage of time and the consolidation of the skills obtained from each of these two interventions indicate the same effectiveness of the two. This finding is consistent with the findings of Bray et al.

(18) that weight loss through various therapies such as surgery and lifestyle-based interventions increases the quality of life.

Ross et al. (13) also believe that the combination of weight loss and physical fitness improves health-related quality of life and leads to increased life expectancy, well-being, general health, mental health, and improved emotional social functioning. Zolotarjova et al. (30) also showed in a study that the use of multifaceted interventions in addition to improving obesity and hyperlipidemia can reduce the risk of cardiovascular disease and improve health-related quality of life. Schutz et al. (19) believe that in weight management-based interventions, quality of life is improved by focusing on weight loss, weekly weight assessment and monitoring, feedback, and reinforcement by the therapist, family members, and friends.

Fontaine et al. (31) with a 13-week lifestyle modification program in the form of a low-fat diet and increased physical activity with a one-year follow-up showed that this program, in addition to the quality of life-related to health Aghaei Meybodi (32) also examined the effect of a psycho-educational intervention on weight loss, self-efficacy and the quality of life-related to health in obese and overweight women and showed that the intervention is effective in reducing the body mass index and improving self-efficacy, and

health-related quality of life in women with overweight obesity. All these findings are in line with the results of this study.

This finding can be justified by the fact that psychological interventions use a variety of strategies to promote health-oriented behaviors, to correct dysfunctional beliefs about and achieving health status. Thus, it can be concluded that these interventions allow people to experience health-oriented behaviors and weight loss in a low-stress environment, without fear of re-gaining weight (13). These interventions increase the level of well-being and weight-related quality of life by emphasizing diet inhibition, increased physical activity, and a healthy eating pattern (19). As a result, such interventions improve physical function, vitality, and reduce the physical discomfort of losing weight.

### Acknowledgement

The authors are grateful to all those who helped us in this research, especially the medical staff of Imam Hossein Hospital and the Center of Behavioral Sciences, as well as the participants in the research.

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