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# Comparison of Training Package (SMN) and Low-Calorie Diet on Psychological Distress and Weight in Overweight People

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**Abstract**

**Objective:** The study was aimed to compare the Training Package (SMN) and low-calorie diet (LCD) on psychological distress and weight in overweight individuals due to decreased adherence different diets.

**Method:** In this clinical trial, the population consisted of all overweight individuals referring to the nutrition clinic of Ardabil in the northwest of Iran. The research was conducted from Oct 2018 to March 2018. For this aim, 30 healthy women (BMI >25 kg/m2, age: 18-30 years) were randomly selected (for each group: 15 subjects). After Anthropometric measurement, the Depression Anxiety Stress Scale (DASS) questionnaire was completed before and after intervention among these persons. The repeated measures of ANOVA have been used for the analysis.

**Results:** The findings showed that there was a significant difference between two groups of Training Package (smn) and LCD and the SMN effect on depression, anxiety, stress, and weight variables is greater than the effect of LCD ($P<0.05$). The series of multiple replications the ANOVA analysis showed that Training Package is a good cure for weight loss.

**Conclusion:** The results showed that the effect of Training Package (SMN) intervention on depression, anxiety, stress, and weight loss was more than the effect of LCD. Therefore, this method can be used as a treatment method for weight loss and psychological distress in obese individuals.

**Keywords:** training package (SMN), low-calorie diet, psychological distress, overweight people, weight.

## Introduction

Today, obesity is a global challenge. Overweight and obesity are defined as the abnormal or excessive fat accumulation that may impair health (WHO, 2018). Over the past three decades, the increasing rates of obesity have led to an alarming obesity epidemic worldwide (Castaneda, Gabani, Choi, et al., 2019). According to the World Health Organization report, 1.9 billion adults are obese or overweight worldwide (World Health Organization, 2016). Generally, the global obesity rate will increase in 2020 in the world (Nouri Saeidlou, Babaei, Ayremlou, 2015). Obesity and prevalence has been 18.5% among adults (> 18 years) (Fallahzadeh, Saadati, keyghobadi, 2017). Iran is one of the seven countries with a high prevalence of obesity (Adibi, klishadi, beihaghi, 2009).

Consumption of different diets seems to be associated with behavioral cognitive impairment, and a diet rich in processed foods is associated with levels of cognitive-behavioral disorders (Bagheri-Dizaj, Alavi, Yekaninejadi, et al. 2016). Eating healthy and unhealthy foods is probably linked to preventing and controlling depression (Khosravi, Sotoudeh,

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Raisi, et al. 2016). The results of a study showed that psychological disorders such as depression are associated with increased or decreased appetite (Payne, Steck, George, et al. 2012). The Rienks study found that the consumption of the Mediterranean diet followed the effects of economic or social factors and the lifestyle of middle-aged women by reducing the incidence of depressive symptoms (Rienks, Dobson, Mishra, 2013). The results showed that the combination of cognitive behavioral group therapy withand diet therapy leads to more weight loss and also increases self-efficacy in women with obesity (Sasanfar, Shabahari, Pazoki, et al, 2016).

Psychological distress were associated with obesity. Obesity has a two-way relationship with psychological stress and its distress (Binsinger, Laure, Ambard, et al., 2006). Based on the results of the present study, the psychological consequences of this disease include negative emotions such as fear of death, depression and anxiety, reduced social activities, feelings of rejection by the community, decreased effective communication with family and society, and stigma experienced by the patient and her/his family (Eisazadeh, Aliakbari Dehkordi , Aghajanbigloo, 2020). The higher psychological distress is associated with an increase in the severity of the symptoms and incidence of mental illness (Stockbridge, Wilson, Pagán, 2014). In the other studies, it has been shown that obese or overweight people had a high rate of psychological distress (Wang, Zhai, 2013). The finding shows that dissatisfaction with body image has a negative effect on stress, anxiety and depression (Khalid, Malik, Musharraf, 2019). Also, the psychological distress and emotional eating are associated with obesity (Spinosa, Christiansen, Dickson, et al., 2019). On the other hand, people with psychiatric disorders are at high risk for obesity (Chao, Wadden, Berkowitz, 2019). The increased risk of psychological distress among bariatric surgery candidates may be attributed, at least in part, to body image dissatisfaction (Geller, Levy, Goldzweig, et al., 2019).

Given that the SMN method uses psychological patterns and methods, there are similarities between the SMN method and cognitive-behavioral therapies. Accordingly the role of behavioral changes in effective weight loss is known. The present method has been tried in the most important behavioral changes for intervention (Hjelmesæth, Rosenvinge, Gade, et al., 2019). That, it has been briefly called SMN in the study (Nemati et al, 2018). This method is a psychological method without weight loss drugs, exercise, herbal tea, and diet. The present method has included eight techniques. The used techniques were preparing the mind, metabolic activation, conscious eating, break the water molecule, understanding the real feeling of hunger, a false feeling of hunger control, creating a real feeling of satiety and learn the false feeling of satiety.

Sohrabi, Pasha and Naderi showed that cognitive behavioral therapy is effective in reducing body mass index and weight loss and improving the self-concept of high-weight individuals (Sohrabi, Pasha, Naderi, et al, 2018). Also, the group cognitive and dietary diets are effective in increasing weight loss (Sasanfar, shabhari, pazoki, et al., 2016). In patients with minor or considerable symptoms of depression, cognitive behavioral therapy was associated with lower body weight and body mass index (Hjelmesæth, Rosenvinge, Gade, et al & Quilty, Allen, Davis, et al, 2019). Castelnuovo, Pietrabissa and Manzoni showed that Cognitive behavioral therapy (CBT) is traditionally recognized as the best established treatment for binge eating disorder and the most preferred intervention for obesity (Castelnuovo, Pietrabissa, Manzoni, et al., 2017). The CBT has been reported more effective in weight loss, and modulation of the stress response in compared with the lifestyle modification (Cooney, Milman, Hantsoo, et al., 2018). Preliminary evidence suggests that cognitive remediation therapy (CRT) improves executive functioning and weight loss in obesity (Hilbert, Blume, Petroff, et al., 2018). Also, the CBT is an efficacious therapy for increasing

cognitive restraint and reducing emotional eating (Jacob, Moullec, Lavoie, et al., 2018). In other study, women in the CBT condition have more weight loss after one year (Jackson, Pietrabissa, Rossi, et al., 2018). One of the problems with cognitive-behavioral therapy was the long-term lack of results, and the length of counseling sessions and the high cost of these sessions, all of which were addressed in the SMN method ( Bayat, Rahimian, Talepasand, Yousefi, 2014 ).

Another used method to lose weight is diet change. This method plays a major role in reducing obesity (Hermsdorff, Zulet, Puchau, et al., 2010). An unhealthy diet with high fat and refined carbohydrates is associated with a high prevalence of obesity, while a healthy diet containing fruits, vegetables and fish and high omega-3s and fiber is associated with low obesity indices (Ahluwalia, Andreeva, Kesse-Guyot, et al., 2013).

Shahriarzade, Kelishadi, Fatehizadeh, et al., 2017 showed that a healthy diet leads to body mass index reduction in obese or overweight individual. As well as, a balanced low-calorie diet has been resulted in weight loss among obese women referred to the nutrition clinic (Ghannadiasl, Mahdavi, 2016).

Overweight people cannot be committed to dietary intervention until the end of the treatment period and it is the disadvantage (Abdi, Atarodi, Mirmiran, et al., 2015). On the other hand, the change in the food basket is too much costly for some people. The main issue of the current study is which of the training package (SMN) and low-calorie diet (LCD) have more impact on psychological distress and weight in overweight individuals.

## Methods

### Participants

The present study is a clinical trial that compares the effectiveness of both SMN and LCD on the psychological distress and weight of overweight individuals. The statistical population included all overweight individuals referring to the nutrition clinic of Ardabil, Iran. Considering that at least 15 samples are considered in experimental research (Delaware, 2008). Consequently, 30 women overweight were randomly selected and assigned to two groups of SMN and LCD (15 people per group). The research was conducted from 1 Oct 2018 to 30 December 2018.

The participants were apparently healthy, non-pregnant and non-lactating obese women, aged 18-30 years and body mass index >25 kg/m² from urban areas. They had no participation in weight loss programs including formal or self-imposed diet and activity program in the previous 6 months. The purpose of the study and security of personal information was given to each participant.

### Ethical Statement

Ethical considerations are determined in the study; the ethical code of human studies is identifier ir.arums.rec.1397.094 from Ardabil University of Medical Sciences. Participants they entered the investigation with conscious consent, and whenever they wanted, they could leave the investigation, and their information remained confidential.

### Measures

Depression Scale, Anxiety and Stress (DASS)

The DASS (Depression Anxiety Stress Scale) Scale was prepared in 1995 by Lovibond and Lovibond (Lovibond, & Lovibond, 1995). This scale has two forms: the main form has 42 questions, each of which evaluates psychological structures “stress”, “anxiety”, and “depression” by 14 different questions. Three factors of anxiety, depression, and stress are measured by the DASS42 scale. Stress is physical and psychological in this scale. Studies by Lovibond and Lovibond (1995) showed that the validity of the retest for sub-scales was 0.81 and 0.74, respectively (Lovibond, & Lovibond, 1995). The range of responses varies from anytime to always. The score is from zero to three, and the zero scores for the option is anytime, Score one for the

little option, score two for the option sometimes, and score three for the option is always considered.

**Training package (SMN) method**

This method, the founder of which is Seyed Mohsen Nemati is a psychological way to lose weight without drug, exercise, herbal remedies, and diet ( Nemati, et al, 2018). This method includes eight techniques that have a scientific foundation and are taught each week in terms of people's progress. The first technique was preparing the mind. This technique was with more acceptances of people to prepare the method SMN. And the sample recorded all eaten foods during the week. The second method was to activate the body's metabolism. In this technique, drinking water can help increase a person's metabolism. Drink lukewarm water every day for 10 glasses, 2 glass in the morning before breakfast and two glass before bed and 2 hours after each meal. (Ritter, 2019). The third technique was eating self-conscious. In this technique a person must be precise to the content of what eats carefully to the actual satiety. Maintaining self-monitoring during obesity treatment may improve outcomes (Raynor, Thomas, Cardoso, et al., 2019). The fourth technique was breaking the water molecule. In this technique, the person tries to slow the speed of chewing power to mentally break the water molecules to be noticed is the result that makes a person when you eat chewing greatly reduced speed and the goal is for the person to practice drinking enough water to maintain this skill of eating slowly. (Uğur, Nergiz-Unal, 2017). The fifth technique was Understanding Realistic Hunger Strength. In this technique, a person should eat food when she/he is hungry (Bruch, 1981). The sixth technique was hunger control. In this technique, when a person becomes angry, this condition indicates false hunger and the need to drink water. The goal of this technique is to feed a person on real hunger and to learn to drink water by learning false hunger. Wurtman, (1988). The seventh technique was Creating Satiety Feeling, real satiety means eating as much as the body really needs, reminds that cravings can cause weight gain in obese people. Wurtman, (1988). The eighth technique was to learn the feeling of false satiety (Suher, Raghunathan, Hoyer, 2016).

**Low-Calorie Diet (LCD)**

For weight loss, the subjects were asked to reduce their consumption by 500-kilocalories. In order to evaluate the diet, the amount of food received in three days (two normal days and one day off) at the beginning of the study was assessed by completing the dietary questionnaires. To complete the questionnaires, information was provided on how to complete the questionnaire, the units of measurement and the selection of days to complete the forms to all individuals. The mentioned amounts of food were converted to grams using the home-help scales, and then coding was carried out according to the N4 food analysis program, and the amount of energy and macronutrients were calculated. Subsequently, volunteers were asked to deduct 500 kilocalories from their daily average in order to lose weight. This energy fraction was based on succession tables of food groups. For this purpose, 4 units of the bread and cereal group, 2 units of the fat group and the rest of the energy were deducted from the rest of the food groups. (Gilbertson, et al. 2019; Albanese, et al. 2019; Umphonsathien, et al. 2019). The majority of nutritionists use this type of diet (Gilbertson, et al. 2019; Albanese, et al. 2019; Umphonsathien, et al. 2019; Ghannadiasl, F., & Mahdavi, R. 2016; Kaić-Rak et al, 2007).

**Anthropometry**

Weight measurement with minimum dress and without shoes is based on the SCA 224 scale with a precision of 0.5 kg and measuring height with a wall hologram, while the hips, shoulders, and heels are tangent to the wall and head facing was carried out at a distance of between heel and top of the head and accurate to 0.1 centimeters. The body mass index was calculated by dividing the weight into kilograms

by the second power of height in meters.

**Procedure**

In this study, the aim was to compare the effect of two weight loss methods, including SMN and LCD, on the weight and psychological distress of individuals. Comparison was performed in three periods of time: pretest, posttest (two months after pretest) and follow-up (two months after education). In this regard, the diet intervention was based on calorie reduction by a dietitian and the SMN method was performed by the researcher on the subjects. The whole duration of the intervention was four months. In this study, SPSS 22 software was used to analyze. Repeated measures of ANOVA were used to analyze the variables. Prerequisites for using the repeated variance analysis test have also been tested.

## Results

The results of Table 1 and 3 show that the level of significance in SMN and LCD is less than 0.05 (p <.05) and the test is significant. Also, according to the table, the SMN therapeutic effect on depression, anxiety, stress, and weight variables is greater than the effect of LCD.

The results of Table 2 and 3 show that the difference between the SMN group and LCD in the dependent variable (F = 10.510, F = 0.95), depression (F = 979.58, 87 / 0 = ETA), anxiety (F = 954.86 = F, ETA = 0.89) and stress (F = 950.94 / 94, ETA = 0.99) are significant. Therefore, it can be considered that SMN method can be as effective as LSD method. However, we refer to Table 4 to determine which method has the greatest effect on the variables.

**Table 2.** Effect of two methods of SMN and LCD on dependent variables

| The dependent variable | DF | MS | F | eta coefficient |
|---|---|---|---|---|
| depression | 1 | 979.581 | 3810.29 | 0.87 |
| **anxiety** | 1 | 954.864 | 4611.13 | 0.87 |
| **stress** | 1 | 950.941 | 3404.77 | 0.92 |
| weight | 1 | 510308.1 | 1971.64 | 0.95 |

**Table 3.** The significance of the test on dependent variables in the three groups of treatment, group, and interaction

| | P- Value | | |
|---|---|---|---|
| | Effect treatment | Effect group | Effect interaction |
| **depression** | 001<. | 0.028 | 0.003 |
| **anxiety** | 001<. | 001<. | 001<. |
| **stress** | 001<. | 001<. | 001<. |
| **weight** | 001<. | 001<. | 001<. |

According to Table 4, the results of Bonfern test show that the effect of diet group on the variables of anxiety and stress in the follow-up stage is higher than the SMN method, but in the variables of depression and weight, the effect of SMN method is more than the diet. .

**Table 1.** Comparison of the effect of SMN and LCD in two groups

| Variables | smn | | | | | | Low-Calorie Diet | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre-test | | Post–test | | Follow-up | | Pre-test | | Post-test | | Follow-up | |
| | M | SE | M | SD | M | SE | M | SD | M | SD | M | SD |
| **Depression** | 3.9 | .14 | 3.3 | .33 | 2.9 | .35 | 3.6 | .33 | 3.1 | .39 | 2.3 | .42 |
| **Anxiety** | 3.8 | .32 | 3.4 | .32 | 3.2 | .39 | 3.6 | .43 | 3.2 | .35 | 2.1 | .14 |
| **Stress** | 3.6 | .39 | 3.4 | .37 | 3.2 | .45 | 3.8 | .38 | 3.2 | .33 | 2.1 | .10 |
| **Weight** | 78.5 | 10.07 | 74.6 | 16.1 | 71.7 | 10.7 | 77.6 | 8.5 | 75.5 | 8.5 | 73.2 | 8.6 |

**Table 4.** Bonferny test results to compare the mean variables of the dependent variable in smn group and lcd in 2 months after the intervention

| (I) factor1 | | (J) factor1 Mean Difference (I-J) Std. Error | | SMN | | | Low-Calorie Diet | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sig | Mean Difference (I-J) | Std. Error | Sig.[a] | | |
| **Depression** | pre | n2 | post | .515* | .074 | .000 | .397* | .090 | .000 |
| | | | Follow-up | .939* | .081 | .000 | .678* | .097 | .000 |
| | post | dimension2 | pre | -.515* | .074 | .000 | -.497* | .090 | .000 |
| | | | Follow-up | .423* | .065 | .000 | .281* | .046 | .000 |
| **Anxiety** | pre | n2 | post | .350* | .044 | .000 | .447* | .133 | .000 |
| | | | Follow-up | .598* | .087 | .000 | 1.491* | .129 | .000 |
| | post | dimension2 | pre | -.350* | .044 | .000 | -.447* | .133 | .000 |
| | | | Follow-up | .248* | .077 | .000 | 1.045* | .093 | .000 |
| **Stress** | pre | n2 | post | .238* | .044 | .000 | .593* | .113 | .000 |
| | | | Follow-up | .478* | .084 | .000 | 1.681* | .085 | .000 |
| | post | dimension2 | pre | -.238* | .044 | .000 | -.593* | .113 | .000 |
| | | | Follow-up | .240* | .087 | .046 | 1.088* | .080 | .000 |
| **Weight** | pre | n2 | post | 3.933* | .248 | .000 | 2.067* | .067 | .000 |
| | | | Follow-up | 6.267* | 1.516 | .003 | 4.333* | .126 | .000 |
| | post | dimension2 | pre | -3.933* | .248 | .000 | -2.067* | .067 | .000 |
| | | | Follow-up | 2.533 | 1.433 | .377 | 2.117* | .118 | .000 |

## Discussion and Conclusion

The main purpose of the research is to Comparison of Training Package (SMN) and Low-Calorie Diet on Psychological Distress and Weight in Overweight People. The results indicated that the level of significance in the two groups of SMN and LCD was significant and the SMN effect on depression, anxiety, stress, and weight variables is greater than the effect of LCD. In general, the results of this study have shown that psychological distress are associated with higher body mass index in obese people, (Mailey, Mullen, et al. 2012). The results of this study are the same as the findings of other researchers, (Byrne, LeMay-Russell, Tanofsky-Kraff, 2019). Considering that the obesity has reached epidemic proportions globally, with at least 2.8 million people dying each year as a result of being overweight or obese, once associated with high-income countries, obesity is now also prevalent in low and middle-income countries (WHO, 2017). As well as, the findings show a strong relationship between anxiety and depression with obesity (Niles, O'Donovan, 2019). Also, there is mounting evidence for a close relationship between obesity and depression. Depression is frequent in obese subjects and, in turn, obesity is associated with a greater risk of depression. Moreover, recent data suggest a role for obesity in treatment-resistant depression (Huet, Delgado, Aouizerate, et al., 2019). In other research has shown that there is a strong link between psychological distress and obesity (Fourrier, et al, Amiri, et al, Ogrodnik, et al, 2019). The findings are inconsistent with Dunkel, Bahrami, Grote, Littleton, Najafi, study, which found that depression, stress, and anxiety were negatively associated with body mass index and obesity. These inconsistencies can be due to cultural reasons such as the type of nutrition in a particular culture, having symptoms of decreased appetite in depression, low percentage of participants

with severe anxiety and stress, specific duration and period of signs of psychological distress, and randomness of choice Sample attributed. In another explanation of this research, we will discuss the effect of SMN method. Due to the fact that the SMN method is based on psychological and cognitive-behavioral therapy techniques, The results of this study with the findings Nakamura, Kawashima, Dobashi, et al., 2019;Sepehri, Hampa, Mashhadi, et al. 2016; Ghaderi, gholamrezaie, Rezaie, 2016; Jelalian, Jandasek, Wolff, et al., 2019 it's the same. The cognitive-behavioral therapy and motivational interviewing are considered as a guide to weight loss programs (Nakamura, Kawashima, Dobashi, et al., 2019). The result has been showed that mindfulness-based eating can be used as an effective excitement intervention in weight management (Sepehri, Hampa, Mashhadi, et al. 2016). The result has been showed that the effectiveness of cognitive-mindedness-based cognitive therapy in reducing perceived stress and eating disorder (Ghaderi, gholamrezaie, Rezaie, 2016). The behavior therapy (BT) was more effective in stabilizing weight status as assessed by body mass index and an improvement in depressed mood (Jelalian, Jandasek, Wolff, et al., 2019). But, other results showed that CBT is effective in weight loss, but symptoms of depression are not low. This non-alignment can be considered as the research population, age and duration of intervention (Hilbert, Blume, Petroff, et al., 2018).

Based on the results, the SMN method could be a method for psychological distress improvement and weight loss in overweight persons. The main advantage of the present method is that it has not been carried out in any research yet and it is the innovator of the researcher (Seyyed Mohsen Nemati, 2018). Another advantage of the SMN method is that there is no limit to the variety of food in this method and it is tried to teach you how to eat the right behavior and that this method can be used for nervous overeating, binge eating and false hunger prevented. An important limitation of this study is the lack of long-term follow-up on the variability of dependent variables, and in particular weight loss, because what is important in weight loss is long-term weight management, which is not recommended. Even two years. It is suggested that researchers examine other dimensions of overweight and psychological distress and use other tool to measure variables related to the subject.

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