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Review Article

Cognitive Behavioral Therapy for Treatment of Adult Obesity

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Abstract

Introduction: Given the increase in the number of obese patients worldwide, economic costs and financial losses caused by obesity, it seems essential to change eating behavior and thought patterns. Non-invasive treatment of obesity, such as physical activity, diet and medication, as well as invasive surgery, have not been successful in treatment of obesity, and reduced weight in most cases returns and weight maintenance has not been stable.

Methods: In order to fulfill the purpose of the study google scholar , Science Direct , PubMed , EMBASE, Cochrane Library databases were searched for the key words weight loss, weight maintenance , obesity, in addition to cognitive behavioral therapy/CBT , lifestyle, behavioral therapy and other related terms and text words to find articles in English between 1970 to 2015.

Results: New treatments for obesity should be multi-dimensional interventions. Cognitive behavioral therapy along with diet and exercise should be used to improve the effectiveness of traditional methods. Cognitive-behavioral therapy of obesity is based on the cause and nature of obesity. This intervention is effective for treating obesity with a focus on sustainable change in lifestyle.

Conclusions: In this review success in an intervention program for the treatment of adult obesity consists of CBT is explained and aimed to evaluate the effect of CBT on obesity treatment since 1970 to 2015.

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Introduction

The prevalence of obesity has dramatically increased worldwide over the last decades and has now reached epidemic proportions. For instance, the global prevalence of obesity has nearly been doubled between 1980 to 2008. According to the World Health Organization, 35% of adults worldwide aged > 20 years old were overweight (34% men and 35% women) in 2008 including 10% men and 14% women were being considered as obese, that their obesity is defined with a BMI greater than or equal to 30. Increased BMI is a major risk factor for non-communicable diseases, such as cardiovascular, diabetes, musculoskeletal disorders (especially osteoarthritis), and some cancers (endometrial, breast, and colon). The higher is BMI, the higher is the risk of noncommunicable diseases. Obesity is largely treatable and preventable. Healthy food and healthy lifestyle are influenced by the environment, culture, socioeconomic issues and awareness of people. Obesity can be defined as a multifactorial syndrome resulting from psychological, social, physiological, metabolic, biochemical, and cultural changes (1, 2, and 3).Given the increase in the number of obese patients worldwide and increase in the economic and financial losses caused by obesity, it seems necessary to change eating behavior and thought patterns. Researches have shown that cognitive behavioral therapy as a treatment approach for weight loss and maintenance of weight over the past 55 years has turned out to be necessary. This form of treatment came into existence in the 1960s, and has become more perfect with the passage of time. These interventions have been suggested as effective methods for modifying the behavior of individuals suffering from obesity. Cognitive behavioral therapy for obesity is based on the cause and nature of obesity. This type of treatment based on the Social, cultural, and biological approaches, and also principles of psychology teaches people to live healthily. By this approach sustainable change in lifestyle will lead to obesity treatment (4, 5, and 6).

Cognitive behavioral therapy is a method that is based on the mental effects, which is used to help to promote certain changes in people and help to relieve emotional, behavioral, social and intellectual ravages. Cognitive behavioral therapists diagnose and treat problems that are caused by irrational thinking, wrong inferences, and incomplete learning. This type of treatment can be conducted by individuals, families and groups. In this type of treatment, problems such as anxiety, depression, anger, shame, low self-esteem, adaptation problems, sleep disturbances, stress and trauma of the past lead to obesity or obesity-related problems. Cognitive behavioral therapy has been used to treat a range of disorders including eating disorders (bulimia and anorexia nervosa), obesity, anxiety, phobias, depression, addiction and maladaptive behavior. The

philosophy behind CBT (Cognitive behavioral therapy) is that our thoughts and feelings play a fundamental role in our behavior (7, 8). Cognitive-behavioral therapy is based on the belief that psychological disorders are caused by poor learning and maladaptive thoughts, and the treatment main goal is to help the patients bring desired changes in their lives. Treatment should create an opportunity for new learning as well as changes in patient s' beliefs. Problem solving is a critical component of the treatment (9).

Obese people often experience thoughts and feelings that promote the flawed and erroneous beliefs in them, such beliefs can lead to bad eating habits and poor body image, and affect different aspects of life, including family, emotional relationships, work and education, for example, people who are obese and have low self-esteem may have a negative opinion about the ability and potential for success in weight loss and maintenance of reduced weight. As a result of negative thought patterns, obese patients may give up treatment, or ignore the opportunities for health advancement and weight loss (8).Cognitive-behavioral therapy of obesity is suitable for patients who have no difficulty with introspection. For effectiveness of cognitive-behavioral therapy, the person should be ready and willing to spend time and make effort to analyze his thoughts and feelings. Such self-analysis can be difficult for obese people, but it is a great way to learn more about how internal states impact on eating behaviors, nutritional and dietary patterns (9, 10).

Cognitive behavioral therapy is also suitable for those looking for short-term treatment options to treat their obesity problem, which does not require medication. One of the biggest advantages of CBT is that, it helps patients to learn coping skills that can be served now and in the future. Cognitive-behavioral therapy of obesity combats the destructive thoughts and behaviors, unhealthy eating patterns. To help obese patients, first their beliefs existing problems should be identified; this process is known as "functional analysis" that is important for learning how thoughts, feelings, and situations can broadly play role in maladaptive eating behaviors. This process as the main part of the treatment process can be difficult and complex, especially for patients who have difficulty with introspection, but can eventually lead to understanding and modifying behaviors and dietary patterns (11, 12).The second part of this treatment focuses on the actual behaviors that are involved in obesity. The patient starts to learn and practice new skills that can be applied in real situations and conditions, for example, a person who suffers from severe obesity can experience adaptive skills and new training methods to avoid social situations that may lead to recurrence of his obesity. In most of obese patients, there are always a factor or factors that individual is unable or refuses to comply with, and fails when confronts the agent repeatedly during diet therapy, for this reason, one may think he is unable to complete the course of obesity treatment; this may include any issues of non-resistance against a particular food, a reluctance to consume a food, or weak will over a long period of treatment and lack of interest in physical activity, and dozens of other causes (8,10,12).

In most obese patients (about 85%), almost half of the weight loss returns during the first year after treatment, and the rest over three to five years after therapy, or goes even further than the initial weight (13). In the field of psychological predictors of weight gain and obesity, two potential causes were identified: a- cognitive factor (dichotomous thinking), b- historical variables (maximum weight in their life). Dichotomous thinking is the strongest predictor of weight regain. People with dichotomous thinking than those with flexible thinking think of the partial failure of the target weight as a total failure, and achieved weight loss is considered inadequate and unsatisfactory; this indicates that, modification of such thinking style can improve the weight loss and weight maintenance (8, 14).Weight loss in obese patients is not the only important thing, but to prevent the recurrence of weight is also important. New approach in cognitive behavioral therapy focuses on the factors that are involved in the weight gain after losing it successfully. According to cognitive-behavioral approach, patients who have lost weight fail to maintain the desired weight for two reasons: first, they have failed to achieve their weight loss goals completely, or in other words have not reduced their weight to the desired level, and also have not achieved the expected resultant identity of weight loss that was their primary goal (8, 10). Based on the cognitive-behavioral analysis of the increase in weight regain, a new approach has been developed for the treatment of obesity, this approach is to minimize the weight regain, and is designed to overcome the psychological barriers of learning and for long-term commitment to effective weight control. In this therapy, there are three main issues to consider: first, treatment helps patients to accept that weight loss is not achieved and second, encourages the adoption of stable weight rather than decreasing it, and the third is to help people learn and apply cognitive behavioral skills needed for successful weight control (8, 12, and 14). The main reason for the failure in maintaining weight loss, is that when obese patients do not achieve the goals or expected benefits, ignore the need to learn new skills for maintaining lower weight, instead, begin previous eating habits and behaviors, and thus, reduced weight reoccurs. (8, 13, 14).

A great number of studies have been done in cognitive behavioral therapy, since this treatment focuses on a specific objective and the results are relatively easily measured (7). The aim of this study was to investigate the effectiveness of cognitive behavioral therapy in reducing weight and maintaining decreased weight.

Methods

Search strategy:

In order to achieve the above purpose, systematic literature searches were performed using databases including: Medline (accessed through PubMed), PsychInfo, CINAHL, ERIC, EMBASE, Cochrane Library for articles published from 1970 to 2015. Additional articles were identified by searching references in pertinent articles and hand-searching of relevant nutrition and obesity journals, including The International Journal of Obesity and Obesity Research, Obesity Reviews, and Google Scholar, published

from 1970 to 2015.

Keywords used to acquire articles include: weight loss, weight maintenance, obesity, in addition to cognitive behavioral therapy/CBT, lifestyle, behavioral therapy and other related terms and text words. These studies inclusion criteria were articles published between 1970 to 2015 (systematic review, meta-analysis review, RCTs, Cohort study, case study), English language, obese adults (aged 18 years old or older).

Literature Search:

The literature search outlined in the methods identified 32300 potential articles, including 5440 duplicates (Fig 1). We identified 510 articles that potentially met all criteria in result of title and abstract screening. 466 articles did not meet the inclusion criteria. Thus, 44 articles were finally included in this review.

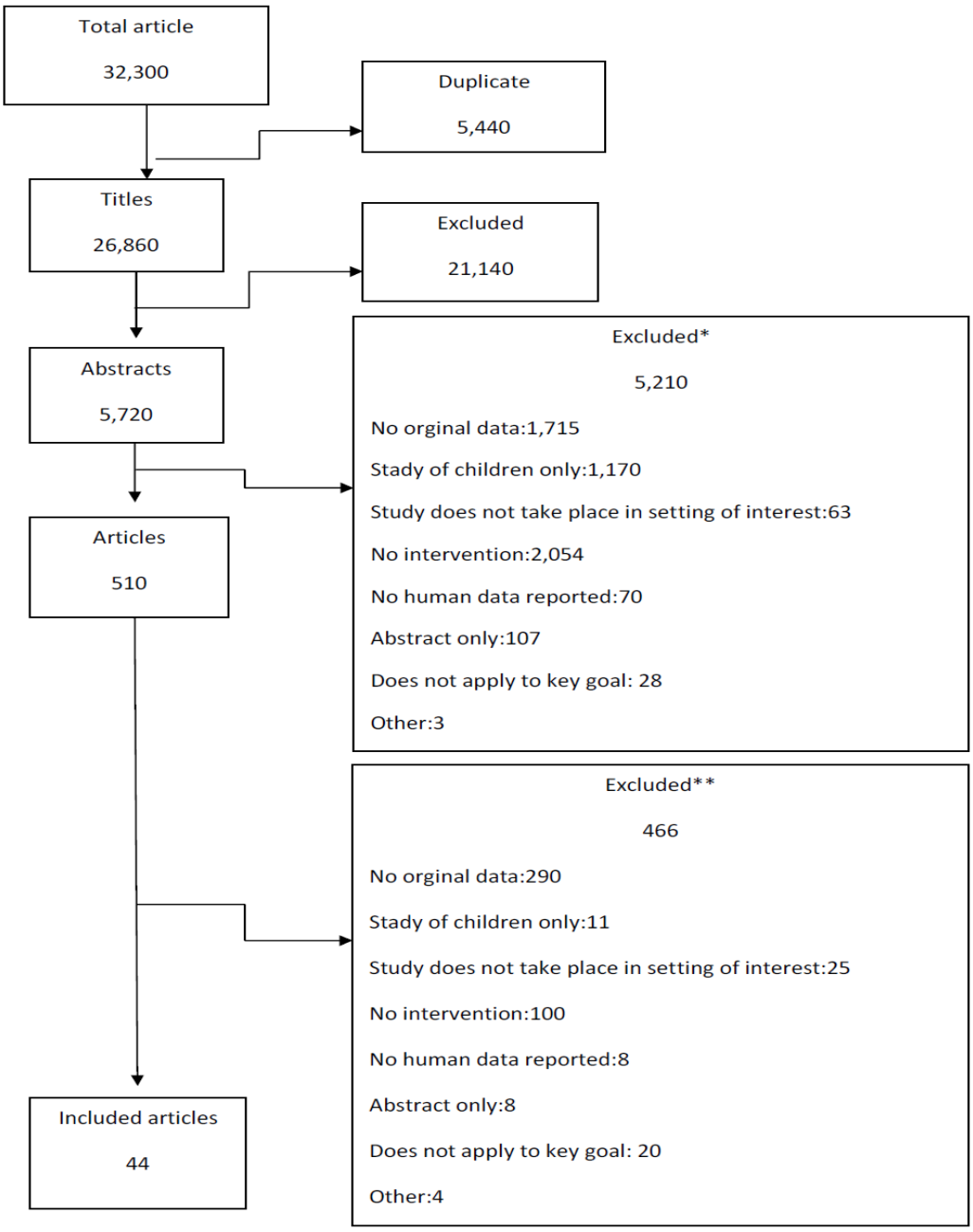

Figure 1.

Literature search for cognitive behavioral therapy for treatment of adult Obesity. *Sum of excluded abstracts exceeds 5210 because reviewers did not agree on reasons for inclusion. **Sum of excluded articles exceeds 466 because reviewers did not agree on reasons for inclusion.

Results

Cognitive-behavioral therapy effectiveness in the treatment of obesity are as follows:

Self-motivation and self-control: One of the concerns of cognitive behavioral therapy for obesity is related to the

patient's self-control failure in a way that the patient is not dedicated to change, in this sense the obese patients manipulate procedures of their reward or their punishment, so the treatment will fail (4). Motivational self-control in eating behavior and energy consumption control and regulation of food intake and increased physical activity can lead to weight loss (4, 8). Behavioral treatment of obesity in patients with underlying conditions such as schizophrenia, depression, anxiety, and stress can also cause significant weight loss. Behavioral training (such as chewing food slowly and short breaks during meals, etc.) strengthens proper eating behaviors in obese patients , reduces the long-term eating stimulants, however functional analysis shows the difficulty of carrying out eating behaviors stimulus control, self-control eating behavior, and alternative instead of eating in obese patients. (15). Behavioral therapy compared to traditional treatment shows significant results in terms of weight loss. Reinforced self-control and behavioral therapies by help of therapist have had significant positive impacts on the eating behaviors and led to weight loss of obese patients (11) although in some studies it has been shown that there has been no significant difference in weight loss between two control and behavioral therapy groups (15).The success of behavioral therapy for obesity may be influenced by many variables, including the age of onset of obesity in different people, sex, patients' self-reinforcing external source or therapist, patients' compliance, physical and mental ability of patients (7, 15, 16).The ingenious studies have provided evidence that shows obese people regulate their food consumption based on external cognitive behavior, and social factors, but not on internal physiological factors (such as gastric motility and hypoglycemia) (17).

Improving eating behaviors: Behavioral therapy includes several steps that may be taken by obese patients or by their therapist help. These treatments may include stimulus package - which includes improving the quantity of meals (for example chewing food slowly, choosing smaller food containers, using a food item per serving, leaving the dinner table for a short while in the middle of eating and leaving some food on the plate), lowering eating frequency (the lack of available food, eating only at specified times, avoiding eating for a period of time when there is the craving to eat, doing an activity incompatible with eating when a glut is in the making, planning for a very attractive activity instead when there is craving for food) and improving the type of food (not buying ready meals or snacks when there is hunger). The results of the stimulus control has been positive. (18). It seems that ten training sessions to educate people and to apply the learned principles as the main aim of treatment is sufficient. In addition, several short sessions of behavioral therapy techniques in order to reduce social pressures or strengthen social knowledge are required to complete weight loss therapy (19). Cognitive behavioral treatment of obesity may be effective for some, but not for all, this means that it may not be applicable for every patient. The response of obese patients to behavioral therapies is different. Some achieve weight loss results faster and some slower (10).Studies have shown that behavioral therapy guided by a competent therapist has better results than only diet or self-control interventions. Weight loss after one year of follow-up by behavioral control methods have shown positive results (an average of 10 -11 pounds), but few studies with follow-up over a year have shown less satisfactory results of weight loss (20).

Reducing the problems associated with obesity: Behavioral therapy in a group or individually causes satisfying weight loss in patients (21). Behavioral therapy along with diet, physical activity, and medication are more effective than the effectiveness of either of them alone (20).Behavioral treatment which leads to weight loss is associated with many health benefits such as improved mood, reduced depression, stress and anxiety, good body image, increased mobility, capable of appearing in the social environment, increased self-esteem and overall health, these benefits can cause the greater weight loss in patients, and create a useful positive cycle in weight loss (22).Behavioral therapy is one of the main tools for the treatment of obesity, which has good results in the short term(one year follow up), but in the long term it should be used along with a low-calorie diet for satisfactory weight loss. The investigation showed that in the five-year follow-up, most patients return to their baseline weight. Cognitive behavioral therapy helps to improve nutrition and increase physical activity, and eliminate obesity associated disorders like eating disorders and behavioral abnormalities (23). Cognitive-behavioral therapy, with an emphasis on lifestyle modification causes sustainable weight loss in patients, and reduces many of the complications of obesity and is associated with benefits such as well-being feeling and public health (12).

Improving cognitive and behavioral skills and body image: Cognitive behavioral therapy helps patients to accept treatment that is required for obesity, and helps to relieve the psychological obstacles, which are in the course of treatment. In addition, this type of treatment the weight stability is one of the ultimate goals of weight loss. Cognitive behavioral therapy causes patients to obtain cognitive and behavioral skills necessary to control weight. These skills can be achieved by the help of the therapist, but after completion of cognitive behavioral therapy, the patient can implement weight control process (8).Different models of cognitive behavioral therapy for weight loss and weight control have been developed, and almost all models have been effective, and behavioral skills developed as a result of this treatment prevent patients to give up treatment (8.12, 14). Cognitive-behavioral therapy along with nutritional method give the appropriate diet information to patients and enable them to obtain a healthy and regular diet without having calorie restriction difficulty. Nutritional education should also include psychotherapy treatment. Nutritional and cognitive behavioral therapies combination result will be satisfaction of body image. Depression and anxiety are reduced by this method. (5, 6, 9).

Improving maintenance of reduced weight: Preventing the recurrence of weight loss is as important as weight loss. One of the things that leads to success in maintaining weight, is that patients should have access to details of the weight loss treatment to support the treatment and prevent eating behavior disorders; the result will be a self-control in

patients, and thereby can strengthen the power to change life style and problem solving in obese patients (24, 15).

Improving the quality of life: During the last three decades, attention to quality of life as an important factor in the evaluation of treatment outcomes and effectiveness of treatment for psychological and physical diseases such as obesity and eating disorders has been increased. On the whole, quality of life covers physical, mental and social aspects of obese people's life. The effects of cognitive behavioral therapy on health-related quality of life is positive and significant in obese patients. The psychological quality of life includes issues such as: the joy of life, sense of meaningfulness in life, power of concentration, self-satisfaction and experiencing situations such as sad mood, hopelessness, anxiety and depression. From the perspective of cognitive-behavioral therapy, obesity is an incorrect behavioral pattern which learning processes play an important role in creating and continuing it. If food intake and eating lead to obtain the desired results such as: sense of well-being and stress reduction, then it will be a preferred method for obtaining the same results. CBT aims to keep patients away from imposed conditions of unhealthy eating habits by using coping skills training, and multi-faceted training. Therefore, it is evident that this technique is effective in improving the psychological aspect of life quality in obese patients. (25, 26, 27). Not only the goal of cognitive-behavioral treatment of obesity is to lose weight, but it is to change unhealthy lifestyle factors, and non-normative nutrition; by reducing the effect of eating behavior disorders and psychological problems, it contributes to obesity treatment in conjunction with other methods (28).

Treatment of eating disorders associated with obesity: One of the problems that obese people suffer from is Binge Eating Disorder (BED) which is actually an incomplete pattern of eating, and the starting point to overcome this problem is weight loss. Cognitive behavioral therapy is an appropriate short-term affordable treatment for Binge eating disorder and associated problems. In groups of diet with cognitive behavioral therapy, and physical activity with cognitive-behavioral therapy weight loss results were significant, as well as depression and anxiety significant decreased scores in all groups. To start the weight loss, it is better to begin with cognitive-behavioral therapy to encourage patients, and reduce symptoms of anxiety and depression, then add physical activity, which in this case achieved results are desirable (29).

Three waves of cognitive behavioral therapy in the treatment of disorders associated with obesity: CBT is used in three different waves for the treatment of psychiatric disorders such as obesity, eating disorders, stress, and anxiety and so on. The first wave of this treatment only includes pure behavioral therapy and focuses on problematic behaviors and destructive emotions that the principles of behavioral therapy are based on the individual circumstances. Low success and lack of learning appropriate responses is not preventable in this manner. Different perceptions of the same behavior created a need for addition of "cognition" to behavior. The second wave is the addition of cognition to behavioral therapy and creation of cognitive behavioral therapy. In this wave, the emphasis is on the role of cognitive processes in the development of conservation and treatment of psychological disorders leading to weight gain and obesity. Cognitive therapy along with behavioral therapy give rise to an increase in successful treatment, and prevention of weight gain recurrence. (30,31,32,34). The third wave includes a wide range of treatments based on the acceptance , commitment, functional analytic psychotherapy , and dialectical behavioral therapy that are more practical in terms of the theory of psychopathology, mechanisms of change and intervention strategies. Third Wave includes ACT According to the framework of communication (RFT), and MCT (meta-cognitive therapy), and EST (emotional schema therapy), and EFCT (emotion-focused cognitive therapy), and MBCT (mindfulness based on cognitive therapy) which are based on slightly different theoretical models and philosophy. The third wave of behavioral therapy along with cognitive behavioral therapy may have positive effects on obesity and eating disorders (30).

Behavioral therapy can cause 8-10 percent weight loss within 6 months of treatment. Structured methods such as replacing foods or food preparation methods have shown an increase in weight loss. Although such studies are important, they provide little information about the effectiveness of this methods in settings outside of specialized clinics whereas some studies have shown that weight loss caused by them outside specialized clinics is less than this amount. It is important to ensure that patients understand the rationale of changing behavior. For behavioral therapy, small and short-term targets should primarily be set at the beginning of treatment to increase patient's motivation and then set larger and long-term goals (34, 35).

Weight loss guidelines in cognitive-behavioral therapy are the followings: Losing weight slowly 1-2 kg / month, setting attainable goals like the reduction of 5-10% of body weight in 6 months, changing habits and improving lifestyle, readiness of patient for weight loss, combination of diet and physical activity with cognitive-behavioral therapy. For the success of cognitive behavioral therapy in weight loss, and weight maintenance three elements of knowledge, motivation, and skills are needed. Due to previous failed weight loss, patients may be reluctant to cognitive-behavioral therapy; In this case, patients should be motivated by techniques such as: the provision of appropriate training, advice on weekly weighing, and the weight check at each visit. By explaining the benefits of weight loss to patients, they can be assured to lose weight (36).

One of the most important issues in cognitive-behavioral therapy is continuing the treatment in follow-up period along with psychotherapy counseling to help patients in weight maintenance. Continuous consultations in cognitive behavior therapy in the follow-up sessions can help patients stay motivated to maintain the reduced weight (31).

Cognitive behavioral therapy includes behavioral skills, and cognitive skills. Behavioral skills are self-control, goal setting, stimulus control, changing behavior, and cognitive skills include problem solving, and cognitive restructuring.

A big range of psychiatric treatments are known as cognitive behavioral therapies, such as isolated cognitive behavioral therapy by Ellis and Beck. In all of these treatments, there are three major and important issues which include: a- cognition affects behavior, b- cognition can be changed, c- cognitive changes can lead to behavioral changes. Cognitive behavioral therapy and behavioral therapy have some similarities and differences. Some of these differences are in this way, that cognitive changes are the first goal of cognitive behavioral therapy while behavioral changes are the first goal of behavioral therapy; cognitive behavioral therapy is done in individual sessions while behavioral therapy can be performed in both individual and group settings, cognitive-behavioral therapy is done in a flexible manner while behavioral therapy is based on predetermined guidelines. There are also a lot of similarities between these two methods: both have limited time and are problem-oriented, therapies are prospective, patient and therapist are both responsible for success of the treatment, patient receives education on the principles of nutrition, such as calorie source, calorie restriction, health effects of weight loss, physical activity and healthy eating patterns. The overlap between the two treatments has often led to interchangeable use of them (3, 37, 14).

Contribution to Obesity in Primary Care: Cognitive-behavioral therapy for obesity in primary care is difficult however this type of treatment for obesity in primary care brings good results. This method increases the motivation and skills of the therapists, and the end result is considerable. CBT in primary care can be done as a group. In general, studies show cognitive group therapy has a lot of advantages and benefits, including the relatively short treatment period, resulting in a lower cost (in relation to the patients' therapist ratio), having social protection, normalization and generality, Publicizing and in particular challenging cognitive mistakes of individuals in the group which will ultimately lead to learn skills and correct erroneous beliefs; due to the mentioned benefits, group cognitive therapy is recognized as an interesting and attractive treatment choice for patients that successfully leads to weight loss in primary care (38,39).

Increasing motivation to lose weight: Motivational interviews in the normal weight control programs can lead to weight loss and body mass index decrease in the obese or overweight patients. Motivational interviewing is a patient-centered method, and the directive is to strengthen and increase the intrinsic motivation to change by exploring, identifying and solving doubts. Motivational interviewing practices are: the balance in decision-making, readiness for change, the increase in the conflict between values and nutritional behaviors, controlling temptations for eating, and describing vision. Some of the obstacles of counseling and nutrition education are related to the efficacy of counseling, and it seems that motivational interviewing and cognitive-behavioral therapy through the following ways will have effective educational programs of weight loss: internal motivation and readiness of individuals for change, more active participation, sustainability and commitment of the treatment plan, reinforcing positive behavior, increasing concerns about unhealthy eating behavior indirectly and without coercion, active participation in programming, evaluation of the changes profits and losses, determining the main life values, increasing the contrast between values and nutritional behaviors, providing information , evaluation and strengthening confidence in the self-efficacy of lifestyle especially eating behavior, focusing on sense of autonomy and freedom of action. (40, 41, 42, 43, 44).

Other weight loss programs: Cognitive behavioral therapy along with some special diets like the Mediterranean diet, as a healthier food choice may be more effective than other methods for weight loss and other chronic diseases prevention (45). Cognitive behavioral therapy together with the other obesity and weight loss treatments will facilitate weight loss and prevent reduced weight relapse. Patients treated with the multi-dimensional methods are more successful in keeping weight loss, and do it with less difficulty and pressure (46).Non-diet programs such as cognitive behavioral therapy, through a direct effect on one's self perception and body image, and by reducing depression and other psychotic disorders can result in weight loss in obese individuals. Decline in the number of patients in this type of treatment was less than other methods, and with the addition of this method to treatment patients can be more eager to continue the treatment. Interactions between changes in weight, body image, and other psychological factors during behavioral treatment of obesity have been documented (47, 48).

Improving sense of well-being and lifestyle changes: There is a direct relationship between well-being and weight loss that cognitive behavioral therapy can reduce symptoms of depression and the feeling of disappointment, and overcome negative indoctrination to reduce weight and maintain reduced weight. This treatment leads to more weight loss through increasing patients' self-esteem. By this method, individuals should be able to control their lives and emotions. Cognitive behavioral therapy, based on the psychological complexity of each individual will determine what needs to be changed, then with applying changes in lifestyle, sustainable weight loss will be possible. (47, 49, 50). In cognitive-behavioral therapy, first obese patients' "thinking" about obesity and themselves must be corrected, and then their "feeling" has to be analyzed in a fashion that the actions should improve their body image and state of well-being, and finally obese patients' eating "behavior" and lifestyle will be changed. In this regard, for some people the trend is apposite that is, their risky behaviors and inappropriate eating habits should be modified, and obese individuals' behavior should be controlled by changing the pattern of unhealthy diet, and also with self-control and preventing improper eating habits reoccurrence, and eventually by cognitive behavioral therapy the therapists can improve a sense of well-being, satisfaction of body size, getting social attention, and psychological state (51, 52).

Cognitive-behavioral treatment of obesity can be done individually or in groups and can also be done through self-help books or computer programs. This therapy will separately treat components (the mindset of patients about obesity, experienced feelings in dealing with obesity, physical changes, experienced discomfort, and finally

attitude and behavior of obese individuals in confronting obesity problem) of obesity which have led to mental instability and overweightness to provide patients with a better understanding of their situations in order to achieve greater success in weight control (8, 14, 53, 54).

Discusion

Cognitive-behavioral treatment of obesity consists of two phases, and three steps. The first phase is weight loss, and the second is the maintenance of reduced weight. Three main stages of cognitive-behavioral treatment for obesity include 1. Changing food intake and dietary patterns and increasing motivation for physical activity and mobility, 2. Challenging the will of the individuals or psychological patterns and dysfunctional thoughts that interfere with the balanced food intake, 3. Sustained weight loss and maintenance of reduced weight that the first and second steps are related to weight loss phase, and the third step is related to weight maintenance phase. Firstly, cognitive-behavioral therapy for obesity include: changes in eating habits, false behavior and food patterns modification along with increased physical activity and mobility that include: learning to recognize destructive food patterns and avoiding them, ability to control overeating, ability to identify social and emotional suggestions for food intake and use of a manageable training program to identify dietary patterns and eating behavior, motivation for exercise and sport, creating a positive and constructive thinking about physical activity and avoiding sedentary lifestyle, improving sense of well-being, and overcoming mental obstacles of physical activity. The second phase of treatment is cognitive that include: identifying cognitive impairments, changes in thinking so that through decreasing disappointment and shame one can succeed, decreasing depression and anxiety caused by obesity or fear of failure, increasing social support and improving obese individuals' personal relationships, learning stress management , improving appearance and self-confidence based on individual beliefs . The third treatment stage is weight maintenance that includes: developing individual weight management programs, preventing weight regain, maintaining motivation for a healthy lifestyle, strengthening skills for coping with challenging situations and problems ahead (8,52,52,58,59,60).

There are criticisms of cognitive behavioral therapy for obesity, including some obese patients suggests that despite their knowledge of unhealthy thoughts and wrong patterns of eating and nutrition, cannot stop unhealthy eating behaviors. Sometimes obesity can lead to lack of concentration and motivation needed for change. Dealing with obesity can cause anxiety in patients for a short time. It is noteworthy, that cognitive-behavioral therapy of obesity is not only acting toward identifying thought patterns , but focuses on the use of a variety of strategies to help obese patients to overcome those thoughts and also increases motivation and confidence for successful weight loss and maintenance of reduced weight (3,9,53.60,62).

Cognitive-behavioral treatment of obesity focuses on improving eating patterns and behaviors, and modifying unhealthy nutrition, and by affecting psychological factors that contribute to obesity leads to weight loss and weight maintenance. CBT does not show these effects alone, but along with diet and adequate physical activity can lead to sustainable weight loss, psychological satisfaction, and reduction of obesity complications such as stress, anxiety, and decreased self-esteem (8, 11, 33, 38, 39, 43).

This study like all other studies had some limitations, including lack of access to the full text of some articles, numerous articles about the effects of cognitive behavioral therapy on obesity and its associated diseases such as diabetes, metabolic syndrome, hypertension, etc, insufficient number of samples in some studies, the small number of studies related to the review, the studies were limited to some countries, little precedent of cognitive behavioral therapy along with other treatments of obesity.

Conclusion

Cognitive-behavioral treatment of obesity along with diet, and physical activity lead to sustained weight loss in obese people. One of the main problems of obese patients, is lack of motivation and fear of failure in weight loss that with the help of this method can overcome these problems. Cognitive behavioral therapy can cause psychological beneficial effects and positive changes in obese patients' vision that helps them to face the difficulties ahead, to lose weight and maintain it. This type of treatment can reduce obesity related disorders or disorders that lead to development of obesity. Adding this type of treatment to other obesity treatments can increase patients' motivation and probability of treatment success. Therefore, cognitive-behavioral therapy as an effective treatment of obesity can facilitate the weight loss and prevent returning reduced weight (3, 8, 28, 46, 53). The results of this study suggest that in order to achieve the best results in terms of weight loss, cognitive-behavioral therapy in the treatment of obesity along with other methods can be used in future researches. In this context, for future studies it is recommended to treat obesity by the help of teamwork, presence of a psychotherapist or multi- dimensional treatment package including diet, physical activity, and cognitive-behavioral therapy.

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