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The impact of interdisciplinary weight loss intervention on reduction in BMI and depression and anxiety levels [HADS] in patients with obesity. A study with repeated measurements design**

Summary

The article presents a study analyzing changes in body mass and depression and anxiety levels among the patients of the Obesity Clinic at the Municipal Hospital in Olsztyn. The aim of this study was to analyze long-term weight loss maintenance, and to evaluate depression and anxiety levels in people with obesity who participated in a weight loss treatment program in the Obesity Clinic in Olsztyn. Forty-five patients participated in a two-week weight loss program. During the treatment, the patients received support from a dietitian, a psychologist, a physician and a physiotherapist. The participants learned to consume regular meals five times a day (1200 kcal per day) to develop new eating habits, and they performed regular physical activity. During cognitive-behavioral therapy, the participants learned techniques that enabled them to reinforce new eating habits and adhere to a healthy diet. The patients were educated by all specialists during the two-week program in the obesity clinic. The study presents the results of the weight loss program in terms of body mass reduction and treatment of anxiety and depression which are often experienced by people with obesity who are unable to lose weight. The BMI and depression and anxiety levels were measured four times: before the weight loss program, at the end of the two-week program, as well as three and six months after the program. The results indicate that the program was effective in promoting sustainable weight loss.

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Introduction

Obesity is a lifestyle disease which has escalated to the level of an epidemic in the 21st century. Depending on the severity of psychophysical complications, obesity may lead to psychophysical disability of both the individual and the society (Clark et al., 2023; Hannum et al., 2004).

Obesity is a complex disease. Body mass is determined by the interactions between genetic, familial, behavioral, cultural, and environmental factors (Dai, Alsallhe, Chalhaf, Riccò, Bragazzi, & Wu, 2020). Obviously, the primary factor responsible for patient weight control is inadequate diet and insufficient physical activity (Moschonis & Trakman, 2023). Psychological factors also exert a significant influence on weight gain and sustainable weight loss. Depression, anxiety disorders, and obesity are commonly co-occurring disorders. This may be determined by their common biological background (Bornstein, Schuppenies, Wong, & Licinio, 2006; Frank, Jokela, Batty, Lassale, Steptoe, & Kivimäki, 2022). Moreover, depression and obesity have been determined to potentially represent the same pathological process. Particularly atypical forms of depression are related to an increase in appetite, regulation of emotions by means of food, reduction of physical activity, and therefore an increase in body mass (Jokela & Laakasuo, 2023; Rosmond, 2004). Moreover, psychological consequences resulting from social stigmatisation of obesity cause the occurrence or intensification of pre-existing depression-anxiety problems (Obara-Gołębiowska, 2016; Puhl & Brownell, 2003). Results of long-term research also emphasise the strong mutual correlation between obesity and depression. It shows that depression increases the probability of the development of obesity (Silva, Coutinho, Ferriani, & Viana, 2020). An opposite dependency also exists, where being obese causes depression. Moreover, efficient reduction of body mass turns out to be a factor in decreasing the level of depression. Being depressive makes it difficult to change one's eating habits, and therefore – to lose excessive weight (Fulton, Décarie-Spain, Fioramonti, Guiard, & Nakajima, 2022; Oyekcin, Yildiz, Şahin, & Gür, 2011). In research by Svenningsson, Björkelund, Marklund and Gedda (2012), depression and anxiety disorders were diagnosed in 25% of obese patients.

Due to the multi-faceted etiology of obesity, various intervention techniques are recommended in weight loss programs. These techniques are implemented by a multidisciplinary team of specialists, including physicians, dieticians, physiotherapists, psychologists and, in some cases, surgeons (Kheniser, Saxon, &

Kashyap, 2021; Tur, Alòs, Iglesias, Luque, Colom, Escudero, & Burguera, 2011). Evidence-based weight loss methods effectively contribute to the treatment of obesity and co-morbid conditions. Cognitive-behavioral therapy (CBT) is one of such methods (Dalle Grave, Soave, Ruocco, Dametti, & Calugi, 2020; Gade, Hjeltnes, Rosenvinge, & Friberg, 2014; Spoer & Fullilove, 2015). Obesity treatment involves lifestyle changes, consumption of regular meals, calorie reduction and exercise (Castellnuovo, Pietrabissa, Manzoni, Cattivelli, Rossi, Novelli, & Molinari, 2017; Comşa, David, & David, 2020). Cognitive-behavioral therapy is often incorporated into weight loss treatments to reinforce new eating habits (Moraes et al., 2020). It enables patients with obesity to change negative self-perceptions as well as attitudes towards the world and people who prevent them from making healthier life choices. The participants are taught practical skills for changing unhealthy habits and achieving healthy weight. This is a very important consideration when obesity results from unsustainable behavioral patterns and low levels of physical exertion (Wadden & Foster, 2000). Cognitive-behavioral therapy is also effective in the treatment of depression and anxiety which can directly influence weight loss and long-term weight loss maintenance (Castellnuovo et al., 2017). Depression and anxiety contribute to overeating, and they must be addressed during therapy. According to research, psychological factors are crucial for implementing effective lifestyle changes and achieving weight loss goals (Jackson, Steptoe, Beeken, Kivimäki, & Wardle, 2014). The key strategies in CBT include stimulus control, problem solving training, motivational interviews, cognitive restructuring, behavioral changes and self-monitoring, goal formulation and analysis of weight loss obstacles. Ash and colleagues (2006) demonstrated that a short-term weight loss program involving CBT delivered positive outcomes immediately after the treatment and at nine-month follow-up. Also the review of the studies about the effectiveness of CBT in implementing lifestyle changes proven the efficacy of CBT interventions in implementing lifestyle changes, especially for weight loss and weight maintenance (Kurnik Mesarič et al., 2023). According to research, both individual and group therapy are effective in obesity management (Comşa et al., 2020; Dalle Grave et al., 2020; Kheniser, Saxon, & Kashyap, 2021).

As is widely known, obesity is a factor leading to numerous psychophysical complications in the general population (Dai et al., 2020). For this reason, it is very important to conduct research focused on finding effective ways to fight obesity. Therefore, the aim of this study was to analyze long-term weight loss maintenance, and to evaluate depression and anxiety levels in people with obesity who participated in a two-week weight loss treatment program in the Obesity Clinic in Olsztyn.

Materials and methods

The study involved 45 women with obesity aged 26 to 66 years ($M = 51.7$; $SD = 12.2$), with a BMI higher than 30 ($M = 35.57$; $SD = 2.36$). Sample selection was performed in accordance with the so-called inclusion criteria. These included: female sex, age over 18, and body mass suggesting obesity. The criteria excluding from the research include failure to meet the basic criteria of inclusion in the research, pregnancy, lactation, legal restrictions, lack of consent for participation in the examination, and absence of sanity due to a mental disorder, serious mental disorders, or addiction.

Table 1. Sociodemographic characteristics of the study group

Education (N)	
Occupational	4
Secondary	16
Higher	25
Marital status (N)	
Married	26
Divorced	8
Widow	6
Single	5
Place of residence (N)	
Village	5
City under 100,000 inhabitants	16
City over 100,000 inhabitants	24

All participants gave verbal consent to participate and the study was approved by the University of Warmia and Mazury Ethics Committee for Scientific Research, Olsztyn, Poland. All subjects participated in a two-week weight loss program in the Obesity Clinic of the Municipal Hospital in Olsztyn. During the program, the patients were placed on a 1200 calorie diet composed of five daily meals. The number of calories and the diet received by the patients was determined by the dietician working on the ward. The focus of the program is on the consumption of regular meals to promote healthy eating habits. The participants were regularly monitored by a diabetologist and an endocrinologist and received round-the-clock nursing care. All patients attended individual and group therapy sessions. During therapy, the patients learned cognitive-behavioral strategies which were helpful during weight loss. The acquired techniques promoted self-control, stimulus control, slow eating, and behavioral reinforcement. The patients were educated about healthy nutrition and the role of social support during weight loss. Other therapeu-

tic techniques were also deployed during individual sessions, including cognitive restructuring, problem solving skills and constructive strategies for coping with stress, depression and negative emotions. The program also included group and individual meetings with a dietician. The patients attended daily physiotherapy sessions, including hydro massage and dry massage. The program involved daily exercise routines, including group training and individual training, to improve the participants' physical fitness levels. The patients also attended dance classes taught by a professional instructor. The participants had free access to the sauna, gym, and exercise beds. During all the above activities, the patients received health education and advice from a physician, a dietician, a psychologist, and a physiotherapist.

After leaving the hospital, each patient received individual guidance from a dietician on diet and the appropriate number of calories. For 3 months after the end of the stay, all patients benefited from the obligatory psychological consultations held twice a month. Meetings were held at the patient's place of residence, via the Internet or by phone. At the meetings, patients received support and psychological help depending on their individual situation and needs. While providing psychological help, cognitive-behavioral strategies were used, consistent with the previous two-week intervention. For the next three months, the patients managed to maintain the introduced changes on their own.

Conducted measurements

The following parameters were measured four times: body mass, body height, and depression and anxiety levels. The first measurement was performed on the first day of the weight loss program. The second measurement was conducted upon the completion of the two-week treatment. The third and fourth measurements were performed three and six months after the weight loss program, respectively. Patients were instructed how to measure their own body weight. They were asked to weigh themselves in the morning on an empty stomach. The results of the third and fourth measurements were collected by post or e-mail.

Changes in body mass were determined by calculating the body mass index based on the following formula: $BMI = \text{body mass} / (\text{body height})^2$. The BMI does not measure body fat percentage, but it is a reliable indicator of obesity, overweight and underweight. The commonly accepted BMI ranges are underweight – $BMI < 18.5$, normal weight – $BMI = 18.5 - 24.99$, overweight – $BMI = 25 - 29.9$, class I obesity – $BMI = 30 - 34.9$, class II obesity – $BMI = 35 - 39.9$, class III obesity – $BMI > 40$.

The applied research tool was Hospital Anxiety and Depression Scale HADS (Zigmond & Snaith, 1983). The questionnaire is applied to analysing the level of