

Medical nutritional therapy during pharmacotherapy for obesity: expert insights

Medyczna terapia żywieniowa w trakcie farmakoterapii choroby otyłościowej: opinia ekspertów

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Medical Studies/Studia Medyczne 2024; 40 (4): 371–380

DOI: <https://doi.org/10.5114/ms.2024.145396>

Key words: obesity, overweight, medical nutrition therapy, pharmacotherapy.

Słowa kluczowe: otyłość, nadwaga, medyczna terapia żywieniowa, farmakoterapia.

Abstract

This manuscript provides a comprehensive overview of expert experiences and perspectives on the role of medical nutrition therapy in enhancing the outcomes of pharmacotherapy for obesity. Through a detailed examination of current practices, challenges, and future directions, this paper seeks to contribute to developing integrated treatment strategies that maximise health benefits for patients with obesity. The findings underscore the importance of a multifaceted approach that includes nutrition, physical activity, and psychological support provided by an interdisciplinary team. Future guidelines should incorporate these comprehensive strategies to improve obesity management effectively.

Streszczenie

W niniejszym manuskrypcie przedstawiono kompleksowy przegląd doświadczeń i perspektyw ekspertów na temat roli medycznej terapii żywieniowej w zakresie poprawy wyników farmakoterapii choroby otyłościowej. Poprzez szczegółową analizę obecnych praktyk, wyzwań i przyszłych kierunków opracowanie to ma na celu przyczynienie się do rozwoju zintegrowanych strategii leczenia, które maksymalizują korzyści zdrowotne dla pacjentów. Analiza podkreśla znaczenie wieloaspektowego podejścia, które obejmuje żywienie, aktywność fizyczną i wsparcie psychologiczne, zapewniane przez zespół interdyscyplinarny. Przyszłe wytyczne powinny uwzględnić te kompleksowe strategie w celu skutecznego radzenia sobie z problemem otyłości.

Introduction

Obesity is a complex and multifactorial disease that poses significant health risks, including diabetes, cardiovascular diseases, and certain cancers [1]. Effective management of obesity requires a multifaceted approach that includes lifestyle modifications, nutritional therapy, pharmacotherapy, or surgery. Medical nutritional therapy (MNT) plays a critical role in improving overall health outcomes in patients with obesity. Pharmacotherapy for obesity has advanced significantly in recent years, providing patients with new options for weight management. New anti-obesity medications demonstrate substantially higher efficacy, with effectiveness depending on the specific drug, leading to an average weight reduction ranging from 5% to more than 15% of initial body weight compared to lifestyle modification alone [2–4]. However,

the success and comfort of pharmacological interventions are often contingent upon concurrent dietary and lifestyle changes. When implemented alongside pharmacotherapy, MNT can help optimise weight loss, preserve lean body mass, and improve overall health. Expert opinions underscore the importance of individualised nutritional plans tailored to the specific needs and conditions of patients undergoing pharmacotherapy for obesity.

This manuscript, an opinion piece, aims to provide a comprehensive overview of expert experiences and perspectives on the role of MNT in enhancing the outcomes of pharmacotherapy for obesity. Through a detailed examination of current practices, challenges, and future directions, this study seeks to contribute to developing integrated treatment strategies that maximise the health benefits for patients with obesity.

Medical nutritional therapy for obesity

MNT should invariably be performed by the prevailing standards established by recognised scientific societies. Currently, the guidelines provided by Obesity Canada [5], the European Association for the Study of Obesity [6], the Polish Obesity Treatment Association [4], and the Polish Society of Dietetics [7] serve as authoritative references in this field. The recommendations are coherent and pay particular attention to several issues. First, MNT focuses on a non-dieting approach. Long-term lifestyle modifications should achieve health outcomes for chronic disease risk reduction and quality of life improvements, not just weight changes. MNT for obesity is provided to improve quality of life and psychological outcomes: general well-being, body image perceptions, cognitive restraint, and eating behaviours. Moreover, it has better results for cardiovascular outcomes, such as lipid profile and blood pressure [8]. Secondly, the nutrition therapy must be tailored to align with individual values, preferences, and treatment objectives. The dietary approach needs to be safe, effective, nutritionally adequate, culturally appropriate, and financially accessible, thereby promoting long-term adherence [9]. All these interventions may contribute to establishing a negative energy balance, which is crucial to reducing weight. Concerning macronutrients, the data confirms that the calorie-restricted dietary patterns that emphasise varying macronutrient distribution ranges can yield comparable reductions in body weight over 6 to 12 months [10]. It is advisable that a balanced diet be ensured, to prevent nutritional deficiencies, necessitating the maintenance of appropriate proportions of the primary macronutrients. However, these proportions may vary significantly based on individual needs and circumstances. Dietary models that serve as frameworks for implementing nutritional changes include the Mediterranean diet, the Dietary Approaches to Stop Hypertension (DASH) diet, the flexitarian diet, the vegetarian diet, the Nordic diet, the portfolio diet, the low glycaemic index diet, and intermittent fasting. Restrictive eating patterns and obesity treatments, including pharmacotherapy, may lead to micronutrient deficiencies, encompassing vitamin D, B₁, B₁₂, and iron [11–14]. Comprehensive assessment, including the evaluation of biochemical markers, can aid in formulating recommendations for dietary intake and vitamin and mineral supplementation. All adults living with obesity should receive personalised MNT administered by a registered dietitian [15]. To the best of our knowledge, there are no official guidelines from organisations and societies regarding exclusively MNT during pharmacotherapy. However, efforts are being made to determine the appropriate approaches for this group of patients, and it is proposed that the specific nutritional needs during obesity pharmacotherapy be incorporated into official guidelines [16].

Key considerations – clinical experience

- MNT is a long-term lifestyle modification focused on health outcomes for chronic disease risk reduction and quality of life improvements, not just weight changes.
- Nutrition therapy must be tailored to individual values, preferences, and treatment objectives. It should also be safe, effective, nutritionally adequate, culturally appropriate, and financially accessible, promoting long-term adherence.
- Recommended dietary models are the Mediterranean diet, the Dietary Approaches to Stop Hypertension (DASH) diet, the flexitarian diet, the vegetarian diet, the Nordic diet, the portfolio diet, the low glycaemic index diet, and intermittent fasting.
- Evaluation of biochemical markers can aid in formulating recommendations for dietary intake and vitamin and mineral supplementation.
- All adults living with obesity should receive personalised MNT administered by a registered dietitian.

Nutritional challenges during pharmacotherapy for obesity

Alteration in body composition

Weight reduction is associated with numerous, predominantly positive health outcomes. Studies indicate, for example – that a decrease of 5–10% in initial body weight favourably impacts glycaemic control, lipid profile, and blood pressure levels [4].

This valuable weight reduction is primarily but not exclusively due to the reduction of body fat content. During calorie-reduced dietary modifications in patients with obesity, we can observe a decrease in fat content and a loss of lean body mass (LBM) in the form of muscle mass. The degree of lean body mass loss observed in studies varies between 20% and 30% of total body loss and depends on factors such as sex, age, and the type and duration of the dietary intervention [17–22]. The reduction in LBM poses several challenges, including impacts on daily functional abilities and a reduction in resting energy expenditure, which hinders the long-term maintenance of a healthy body weight [23]. It is important to emphasise that in patients with excess body weight, a significant reduction in fat mass, even if accompanied by a loss of LBM, results in an improved ratio of body tissues, which translates to enhanced overall health. Given the growing prevalence and efficacy of anti-obesity medications, there are emerging concerns about the potential loss of lean body mass during the weight reduction process. The impact of contemporary anti-obesity medications is one of the subjects of extensive scientific research. It appears that MNT, physical activity, and the degree of weight loss are key factors influencing body composition. Nutritional education combined with liraglutide treat-

ment at the General University Hospital of Valencia (Spain) significantly increased weight and fat mass loss compared to liraglutide alone. Both groups experienced decreased skeletal muscle mass, particularly in the education group, probably related to the greater intensity of weight loss [24]. Studies with naltrexone/bupropion also showed a significant absolute reduction in lean mass. However, the ratio of lean mass loss to body fat loss with naltrexone/bupropion was comparable to that observed in the placebo group [25]. On the other hand, Pandey *et al.*, in a study of adults without diabetes, predominantly women with overweight or obesity, observed that liraglutide plus a lifestyle intervention significantly reduced thigh muscle fat compared to placebo after 40 weeks of treatment. Additionally, liraglutide decreased the proportion of participants with adverse muscle composition, characterised by high muscle fat and low muscle volume [26]. These findings suggest that liraglutide plus lifestyle intervention not only reduces body fat but also improves muscle composition. A study assessing the effect of liraglutide, at doses up to 3.0 mg/day, on body composition in overweight and obese elderly individuals with type 2 diabetes mellitus revealed that the treatment was associated with reductions in fat mass and android fat while preserving muscle mass, thus helping to prevent sarcopaenia [27]. A systematic review of the impact of semaglutide impact on lean mass revealed that obese adults experienced significant weight reductions primarily due to fat mass loss. While lean mass remained stable in some instances, notable reductions were observed in others, especially in larger trials. Despite this, the proportion of lean mass relative to total body mass increased, indicating a positive health outcomes [28]. Studies with tirzepatide have demonstrated reductions in fat and lean body mass. Although a reduction in fat-free muscle mass was observed, a greater-than-expected decrease in muscle fat infiltration was also noticed [29,30]. Considering the study's results, it is crucial to incorporate appropriate training, adequate protein intake, and energy restriction into the diet to minimise muscle mass loss and reduce the risk of sarcopaenia. According to experts, pharmacotherapy combined with supervised resistance exercise can significantly increase lean mass and strength. They emphasise the importance of continuing exercise after completing a low-calorie diet with pharmacological support to maintain body weight [31]. A systematic review to determine if resistance training can mitigate muscle loss during caloric restriction in obese elderly individuals revealed that it could prevent nearly all muscle loss induced by calorie deficiency while achieving similar reductions in fat and total body mass as diet alone [32]. Regarding the role of protein in an energy-restriction diet, research findings on muscle protein anabolism indicate that achieving an adequate protein intake may be crucial for preserving muscle mass [33–35]. We

currently do not have detailed recommendations regarding protein intake during pharmacotherapy for obesity. However, based on observations of patients following bariatric surgery, it can be noted that significant weight loss requires an increased proportion of this macronutrient in dietary energy intake. According to the Polish Society of Dietetics, patients who have undergone sleeve gastrectomy should consume about 1.5 g/kg of ideal body weight per day [7]. This approach may also be suitable for individuals undergoing pharmacotherapy, particularly older and physically active patients, although further in-depth research is required. Regardless of the absolute daily protein intake, its proportion in the overall caloric intake will significantly increase due to substantial energy restriction. All the above studies, researchers' observations, and clinical experiences led us to formulate several patient recommendations.

Key considerations – clinical experience

- Weight reduction in the treatment of obesity should be planned for the long term.
- The reduction in daily energy intake associated with the medication should be about 500–600 kcal, leading to a weight loss of approximately 0.5–1 kg per week (about 2–4 kg per month) [4, 5].
- Patients should be encouraged to engage in physical activity during and after pharmacological treatment for obesity. Regular physical activity, including ≥ 30 –60 min of endurance exercise ≥ 5 times weekly, is recommended. Particular attention should be given to performing strength training at least twice weekly, targeting all major muscle groups [4].
- Protein is an essential component of the diet during the pharmacological treatment of obesity. Its contribution to the daily energy intake should be higher than standard recommendations. Based on clinical observations, 1.5 g of protein per kg of ideal body weight (especially in older adults, physically active individuals, and those with significant weight loss) is appropriate for this group of patients [35].
- An essential element of care is the initial assessment of body composition and monitoring of anthropometric parameters throughout the treatment.

Qualitative malnutrition due to macro- and micronutrient deficiency

Malnutrition is a comprehensive term that refers to deficiencies, excesses, or imbalances in the intake of energy or nutrients and the consequent physiological changes that arise from such imbalances. It is observed that people living with obesity frequently exhibit biochemical evidence of deficiencies in micronutrients, including vitamin D, vitamin B₁₂, folate, thiamine, iron, and zinc [36–38]. Moreover, inadequate intakes of calcium, magnesium, and vita-

mins A, E, and C have been documented among this group of patients [39, 40]. Restrictive eating patterns and obesity treatments, including pharmacotherapy, may lead to profound micronutrient deficiencies due to inadequate nutrient intake or impaired absorption. Particular attention should be paid to patients with monotonous diets or poor quality and those who experience better appetite suppression or more severe gastrointestinal adverse events. Also, the elderly and people with other chronic diseases may not meet the recommended intake of critical nutrients, such as protein or vitamins, due to changes in metabolism and absorption [41]. Therefore, it is prudent to conduct a comprehensive assessment of biochemical parameters and diet quality by a registered dietitian before implementing pharmacotherapy and establishing preventive measures and regular monitoring throughout the treatment process. No studies have specifically examined the impact of routine micronutrient supplementation on the risk of nutritional deficiencies during obesity pharmacotherapy. However, evidence suggests that dietary supplementation with a complete multivitamin is associated with a reduced risk of micronutrient deficiency in adults, particularly among individuals living with obesity [42, 43]. Consequently, targeted micronutrient supplementation may be necessary to address deficiencies in patients identified with a lack of micronutrients before or during drug therapy [16].

Hair loss

Hair loss is observed in patients on very restrictive diets, after rapid weight loss, and following bariatric surgery [44]. A systematic review and meta-analysis from 2022 revealed that hair loss is common after metabolic and bariatric surgery, especially in younger women and those with low serum levels of zinc, folic acid, and ferritin [45]. In a scoping review regarding dermatologic findings associated with semaglutide use, only 0.2% of patients on 2.4 mg subcutaneous semaglutide reported alopecia, compared to 0.5% of patients on placebo [46]. Researchers highlight the potential protective effects of these medications on hair health, such as increased insulin sensitivity and improved scalp blood circulation, but also potential risks, such as disrupted hair growth cycles or premature androgenetic alopecia. Due to these concerns, clinicians see the need for further investigation into hair conditions during treatment with modern anti-obesity drugs [47]. Essential nutrients responsible for hair loss during weight loss diets include protein, fatty acids, iron, zinc, and vitamins B and D. However, it should also be emphasised that overconsumption of nutritional supplements can lead to hair loss and should be avoided unless a deficiency is confirmed [48, 49]. Considering the above and recognizing that weight reduction diets followed by patients during

pharmacotherapy may be nutritionally deficient, it is essential to focus on critical dietary components that influence hair health

Key considerations – clinical experience

- Due to the significant dietary restrictions undertaken by patients during pharmacotherapy for obesity, it is essential to ensure proper education and a well-balanced diet with an appropriate energy deficit.
- Attention must be given to the intake of critical nutrients, including protein, vitamin D, iron, zinc, B vitamins, and polyunsaturated fatty acids.
- Patients should be closely monitored for potential deficiencies; if any are suspected, appropriate laboratory tests should be conducted.
- In confirmed cases of nutrient deficiencies, supplementation should be considered.
- It is essential to conduct a comprehensive assessment of diet quality by a registered dietitian before and during obesity pharmacotherapy.

Potential gastrointestinal complaints and solutions in the context of obesity pharmacotherapy

The most prevalent adverse events associated with obesity pharmacotherapy are gastrointestinal disturbances, including nausea, diarrhoea, and constipation. These symptoms are mainly related to incretin-based medications. In registration trials, most of these events were classified as mild to moderate and generally transient, with infrequent occurrences leading to treatment discontinuation [16, 49–51]. Dietary modifications may be beneficial in alleviating gastrointestinal symptoms.

Nausea

The frequency of occurrence of nausea across clinical trials typically ranges from 15% to 50% [52]. The prevalence of symptoms is notably higher during the initial 4 to 5 weeks of treatment, a period characterised by a more pronounced delay in gastric emptying, subsequently decreasing after that [53]. Symptoms are generally moderate in intensity and tend to resolve within 8 days or less following their onset [54, 55]. For a patient experiencing this side effect, the following recommendations may be beneficial:

- Plan to consume 5 to 6 small meals throughout the day.
- Eat meals calmly, eating slowly, and chewing food thoroughly.
- Avoid foods that are difficult to digest, such as fried dishes, cabbage, legumes, sweets, chips, and fast food.
- Steer clear of very hot or very cold dishes.
- Replace spicy spices with mild herbs like dill, basil, and oregano.

- Refrain from drinking fluids immediately before and after meals; instead, consume liquids and snacks between meals.
- Ensure adequate ventilation in the dining area to minimize exposure to irritating odours.
- Avoid engaging in intense physical activity or lying down immediately after meals, and refrain from eating right before bedtime.
- Consider consuming ginger, peppermint tea, sugar-free candies, or menthol-flavoured chewing gum, which may provide additional relief [56].

Diarrhoea

The frequency of diarrhoea varies across clinical trials, typically ranging from 5% to 25% [53]. Diarrhoea often occurs within the first 4 weeks of treatment, after which the incidence significantly declines. Symptoms are generally reported to persist for approximately 3 days [57, 58]. It is primarily recommended for patients with diarrhoea to:

- Consume water with an intake of 2 to 2.5 l/day and other suitable fluids such as weak tea and blackberry infusion.
- Avoid sweetened beverages, particularly those containing artificial sweeteners or high levels of sorbitol, such as plum or pear juice and sweets or chewing gum containing xylitol.
- Limit food high in insoluble fibre.
- Avoid dairy products high in lactose, coffee, and alcoholic drinks.
- Decrease intake of hard-to-digest foods, those that may cause bloating, as well as fatty, fried, spicy, and raw foods, which are high in insoluble fiber.
- Recommended foods include peeled, cooked vegetables and fruits, bread made from refined flour, small groats, jellies, carrot puree, rice rusks, rice wafers, and bananas.
- In cases of severe diarrhoea, short-term implementation of the BRAT diet may be beneficial. This dietary protocol includes the consumption of bananas, rice, boiled apples, and wheat toast [59].
- Additionally, consideration may be given to probiotic therapy, utilising strains such as *Lactobacillus rhamnosus* GG or *Saccharomyces boulardii* to support gut health during recovery [60, 61].

Constipation

Constipation generally occurs with a frequency ranging from 4% to 12%. However, specific trials have reported a prevalence as high as 25% to 35% among individuals with obesity [58]. The onset of constipation may occur within the first 16 weeks of treatment, particularly during the initial 28 days [53, 58, 62–64]. Symptoms of constipation have been documented to persist longer than those of other adverse effects. In individuals receiving GLP-1 therapy, constipation

symptoms have been reported to last for a median duration of 47 days [55].

If an individual experiences constipation while undergoing medication treatment, lifestyle modifications can serve as a supportive measure. This approach is founded on three fundamental pillars:

- Adequate hydration:
 - Ensuring sufficient fluid intake is essential, with a recommended daily consumption of 2 to 2.5 l.
 - These fluids should not act as additional sources of energy; thus, sweetened beverages, including juices, compotes, and drinks sweetened with sugar or honey, should be avoided.
 - Moderate coffee consumption is also advisable if tolerated and without contraindications, such as gastroesophageal reflux disease.
- Anti-constipation diet:
 - Adequate fibre intake, averaging 35 g/day, with the option to increase this intake to 50–60 g periodically. Emphasis should be placed on insoluble fibre, which is crucial in regulating intestinal function. Gradual increases in high-fibre foods are recommended to facilitate adaptation.
 - The diet should incorporate vegetables and fruits with their skins, whole grain cereals, wheat bran, coarse-grained groats, and vegetable fats rich in monounsaturated and polyunsaturated fatty acids, preferably from the omega-3 group.
 - Fermented products such as sauerkraut, pickles, and dairy items like yogurt, buttermilk, and sour milk provide natural prebiotics and probiotics that enhance intestinal health.
 - Regular meal timing is also significant for individuals experiencing constipation.
 - In certain instances, consuming warm water with lemon on an empty stomach, dried plums (soaked overnight), or psyllium seeds may yield beneficial effects.
- Physical activity:
 - Increasing physical activity through walking, jogging, and swimming is recommended.
 - Exercises to strengthen the abdominal muscles may also be advantageous in certain situations [65].

The issue of constipation is complex and should encompass the aforementioned vital recommendations and the psychosomatic factors contributing to the condition. If neurogenic constipation is particularly problematic, psychotherapy or relaxation techniques may prove helpful [65].

Abdominal discomfort, dyspepsia, gastroesophageal reflux disease (GERD)

Among the less frequently observed side effects of incretin-based therapies are abdominal discomfort, dyspepsia, and GERD. According to studies, these adverse effects are generally mild to moderate in severity

and usually affect less than 10% of patients undergoing treatment [53, 66, 67]. Nutritional recommendations for mitigating the aforementioned symptoms include adhering to a light, easily digestible diet, consuming small, frequent meals, thoroughly chewing food, and eating in a relaxed environment. It is also advisable to drink water between meals, aiming for approximately 1.5 to 2 l/day. In cases of reflux, patients should avoid strong coffee, tea, cocoa, tomatoes and their derivatives, onions, and gas-producing vegetables. Additionally, limiting fried foods, reducing the intake of simple sugars, sweets, alcohol, fruit juices, citrus fruits, and carbonated beverages is recommended [68].

The occurrence of side effects necessitates continuous monitoring and adjustments to dietary recommendations and therapeutic interventions if required. Patients should be advised to consult their clinicians if gastrointestinal symptoms do not resolve over time as anticipated or if symptoms worsen.

Key considerations – clinical experience

- The most prevalent adverse events associated with obesity pharmacotherapy are gastrointestinal disturbances, including nausea, diarrhoea, and constipation.
- Most of these symptoms are mild to moderate and generally transient.
- Dietary modifications may be beneficial in alleviating gastrointestinal symptoms.
- Patients should be advised to consult their clinicians if gastrointestinal symptoms do not resolve over time as anticipated or if symptoms worsen.

The healthy eating plate during pharmacotherapy

Given the significant changes in appetite and the frequent implementation of very low-energy di-

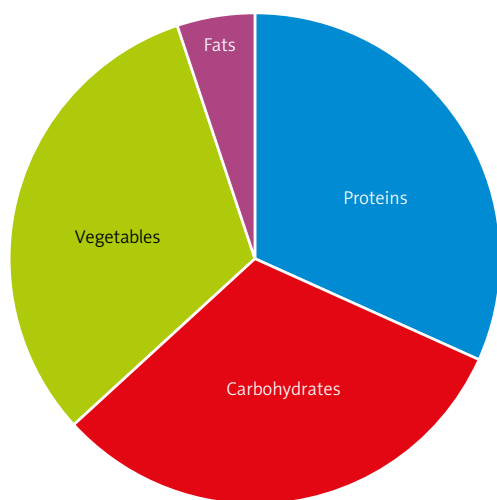


Figure 1. Healthy Plate during obesity pharmacotherapy (modified based on the bariatric plate) [72]

ets, it is advisable to modify the selection of products and their proportions in the nutrition of patients undergoing pharmacotherapy. When food consumption decreases, it is essential to counsel patients to enhance the quality of the foods they ingest. No study evaluates the benefits of consuming specific types of foods in this condition. However, research on significant and rapid weight loss achieved through very low-calorie diets and bariatric surgery has highlighted the importance of prioritising servings of lean protein to help preserve lean body mass [69]. It is recommended that the adult population consume a minimum of 0.8 grams of protein per kilogram of body weight [41]. Higher protein intake (1.5 g/kg of ideal body weight per day) may be appropriate for patients with elevated body mass indices, particularly those who resemble individuals undergoing bariatric surgery [70]. Moreover, when a patient experiences early satiety, nutritional intake becomes critical to prevent deficiencies in energy, protein, and micronutrients. Daily nutrition should be based on the intake of fruits, vegetables, fibre, and other nutrient-dense foods while simultaneously reducing the consumption of foods high in saturated fat or added sugars [71]. In clinical practice, we recommend adjusting the proportions of food items in composed meals. According to established nutritional models, vegetables should form the meal foundation for people with obesity. However, among patients undergoing pharmacotherapy, who experience significant reductions in appetite and rapid satiety, consuming large quantities of vegetables may lead to excluding adequate protein products, grains, and healthy fats. Therefore, in such cases, it is advisable to modify the nutritional plate following the recommendations for bariatric patients (Figure 1) [72]. The daily inclusion of high-protein shake(s) may facilitate the achievement of these protein intake targets.

In a balanced dietary plan, the recommended sources of macronutrients (Healthy Eating Plate) should include a variety of vegetables (prioritising vegetables, especially leafy greens, and excluding starchy vegetables), healthy fats (ideally from mono-unsaturated sources like olive oil and canola oil, as well as polyunsaturated sources such as fatty sea fish, flaxseed oil, nuts, and seeds), protein derived from both animal sources (low-fat dairy products, eggs, lean meats, and fish) and plant sources (tofu, legumes, pulses, and nuts), and carbohydrates, preferably from whole-grain products such as cereals, grains, bread, and flakes [4–6, 73].

Key considerations – clinical experience

Given the significant changes in appetite and the frequent implementation of very low-energy diets, modifying the selection of products and their proportions in the nutrition of patients undergoing pharmacotherapy is advisable.

When a patient experiences early satiety, nutritional intake becomes critical to prevent deficiencies in energy, protein, and micronutrients.

Among patients undergoing pharmacotherapy, it is advisable to modify the nutritional plate following the recommendations for bariatric patients

Psychodietetics context – clinical observations

In the context of effective obesity treatment, the psychological aspect is indispensable. It also plays a crucial role in obesity pharmacotherapy. Several psychological factors contribute to the development of obesity, including dysregulation of self-regulatory mechanisms, individual beliefs and expectations, personality traits, and difficulties in coping with stress and emotions. Additionally, obesity can lead to the development of psychological disorders such as depression, low mood, and even suicidal thoughts [74, 75]. Therefore, patients undergoing pharmacotherapy for obesity should be carefully monitored for maladaptive patterns of thinking about food (overestimating or underestimating the caloric value of products and meals, morally valuing dietary choices or behaviours conducive to weight loss such as – “food is slimming or not”, “I’m on a diet so I’m okay, I’m not on a diet so I’m not okay”, “diet products are good, others are bad”), as well as thoughts about their bodies (unrealistic perception of body size, the intense pursuit of a specific “number on the scale”, unrealistic goals), and maladaptive eating styles (starvation- “On medication, I don’t need to eat because I don’t feel hungry – so I don’t eat”, or emotional eating). Patients should also be monitored for the emergence of eating disorders (“Lately I only eat chocolate because I like it. I eat a little because on medication that’s enough for me. I don’t feel like eating anything else”), the presence of depression, and difficulties in coping with stress [4]. For individuals who achieve the intended effects of obesity treatment, social support is also crucial. These patients may experience stigma or lack of support from family or friends. The lifestyle of individuals during and after therapy may significantly differ from that of their family. This can lead to feelings of misunderstanding or even loneliness. Some patients also struggle with excessive attention and constant questions prompted by their changes in appearance [76].

Conclusions

Addressing obesity during pharmacotherapy requires a multifaceted approach that includes Medical Nutrition Therapy, physical activity, and psychological support. This care should be provided by an interdisciplinary team comprising a physician, dietitian, physiotherapist, and psychologist. Integration of the elements mentioned above is crucial for optimising health outcomes. Continuous monitoring of weight loss progress,

dietary intake, and potential nutrient deficiencies is essential to prevent adverse effects. A personalised nutritional approach tailored to individual patient needs can also be beneficial in alleviating gastrointestinal symptoms. Furthermore, understanding the psychological aspects of obesity and providing social support can significantly enhance treatment efficacy and patient well-being. Future guidelines should incorporate these comprehensive strategies to improve the management of obesity effectively.

Author contributions

Matylda Kręgielska-Narożna (MKN), Katarzyna Pastusiak-Zgolińska (KPZ), and Paweł Bogdański (PB) were involved with the design of the work. MKN and KP were involved with data collection and interpretation. MKN and KP were involved in writing the manuscript. Lucyna Ostrowska (LO), PB, provided critical revision. MKN and KPZ contributed equally to this work and share first authorship.

Acknowledgments

We would like to acknowledge the assistance of ChatGPT, a language model developed by OpenAI, for its help in language editing and proofreading this manuscript.

Funding

No external funding.

Ethical approval

Not applicable.

Conflict of interest

PB received payment or honoraria for lectures and educational brochures from Novo Nordisk, Eli Lilly, Bausch Health. LO received payment or honoraria for lectures and educational brochures from Novo Nordisk, Eli Lilly, Bausch Health. KP received payment or honoraria for lectures and educational brochures from Novo Nordisk. MKN received payment or honoraria for lectures and educational brochures from Novo Nordisk.

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Submitted: 11.10.2024

Accepted: 11.10.2024

Online publication: 2.12.2024